APP #	TITLE	BUDGET REQ	FUND?	SCORE (MEDIAN)	Mean	SD	Low	High	Y	N
EDUC4-12822	CIRM Scholars Comprehensive Research Training Program	$5,000,000	Y	98	97	2	90	100	14	0
EDUC4-12782	CIRM Scholar Training Program	$4,974,073	Y	95	95	2	92	100	13	0
EDUC4-12753	Training Program in Stem Cell Biology	$5,000,000	Y	95	94	2	90	97	15	0
EDUC4-12812	Scholars Research Training Program in Regenerative Medicine, Gene Therapy, and Stem Cell Research	$5,000,000	Y	92	92	3	88	95	14	0
EDUC4-12821	CIRM Training Program in Stem Cell Biology and Engineering	$1,924,497	Y	91	92	3	88	95	14	0
EDUC4-12804	Interdisciplinary Stem Cell Training Grant	$4,992,446	Y	90	91	1	89	95	14	0
EDUC4-12813	A Multidisciplinary Stem Cell Training Program, A Critical Component of the [Regional] Educational Network	$4,915,671	Y	90	90	1	90	92	15	0
EDUC4-12756	Training Program Bridging Stem Cell Research with Clinical Applications in Regenerative Medicine	$5,000,000	Y	90	90	2	85	95	14	0
EDUC4-12792	CIRM Cell and Gene Therapy Training Program 2.0	$4,966,300	Y	90	90	2	88	95	14	0
EDUC4-12790	Training the Next Generation of Biologists and Engineers for Regenerative Medicine	$4,954,238	Y	90	90	2	87	93	13	0
EDUC4-12772	Research Training Program in Stem Cell Biology and Regenerative Medicine	$4,860,989	Y	88	88	0	88	89	14	0
EDUC4-12802	CIRM Training Program for Stem Cell and Regenerative Medicine Research	$4,999,500	Y	88	88	1	85	90	14	0
EDUC4-12759	CIRM Training Program in Systems Biology of Stem Cells	$4,913,271	Y	86	86	1	85	88	14	0
EDUC4-12751	CIRM Training Program in Translational Regenerative Medicine	$4,999,333	Y	86	86	1	85	88	13	0
EDUC4-12837	Stem Cell Training Program	$4,999,999	Y	85	86	1	85	89	14	0
EDUC4-12752	TRANSCEND – Training Program to Advance Interdisciplinary Stem Cell Research, Education, and Workforce Diversity	$4,993,115	Y	85	86	1	84	88	13	1
EDUC4-12766	CIRM Regenerative Medicine Research Training Program	$5,000,000	Y	85	86	4	80	92	9	6
EDUC4-12811	Training Scholars in Regenerative Medicine and Stem Cell Research	$4,931,353	Y	85	84	5	72	95	8	6

Application #	EDUC4-12822
Title (as written by the applicant)	CIRM Scholars Comprehensive Research Training Program
Public Abstract (as written by the applicant)	We will deliver a comprehensive doctoral, postdoctoral and clinical researcher training program designed to develop the current and next generation of researchers in the fields of stem cell biology, gene therapy and regenerative medicine. Our program is centered around the comprehensive understanding, use and manipulation of stem and progenitor cells, cells which promise to revolutionize the way that human diseases and disorders are treated. Advancing the goals of CIRM to develop new treatments for human disease based on stem and progenitor cells will require the understanding and application of multiple technologies. Researchers in this field will need to understand multiple disciplines and participate in multi-disciplinary research teams where each of the participants understands the capabilities and shortcomings of each other's technologies. Trainees will be recruited from within existing labs and by external recruitment with the goal of recruiting a diverse cohort of young scientists. Our stem cell training program will emphasize broad, cross-disciplinary training, exposing trainees to concepts and techniques in diverse fields such as stem cell biology, biomedical engineering, pre-clinical development and clinical practice. Didactic courses are tailored to address the needs of the researchers of the future. All incoming trainees will have the opportunity to learn the ethical conduct of hypothesis driven research, understand the concepts of reproducibility and rigor, know advanced techniques in cell, DNA, RNA and protein analysis and participate in team building exercises in hypothesis driven research. A new course on the ethical, legal and societal implications of stem cell research will be offered for trainees at all levels. Journal clubs will allow fellows to keep abreast of the latest developments in the field. In addition, we will host monthly seminars where experts present the latest developments in multiple fields related to stem cell research, gene therapy and regenerative medicine including developmental biology, bioengineering, molecular biology, etc. In this way fellows can be updated on the latest developments in the field broadly defined. Lectures will be recorded for web access so that topics can be revisited at leisure and accessed by the entire stem cell research community. Events carried out throughout the year will expose trainees first-hand to patients and disease advocates, in order to discuss the real-world challenges facing treatment. Trainees will be coached in communications skills so as to help in their outreach within the scientific, lay and patient communities. An annual retreat will allow the program administration to determine progress of all trainees as well as allowing trainees to share their results with experts in the field and to develop networking skills. The overall goal will be to train researchers capable of carrying out multidisciplinary research and developing new treatments for new human disease.
Statement of Benefit to California (as written by the applicant)	A primary goal of Proposition 14 is to continue to translate basic stem cell research to clinical applications. The disability and loss of personal freedom and earning power resulting from a disease or disorder are devastating and create a financial burden for California in addition to the suffering caused to patients and their families. Therapies using stem cells have the potential to change millions of lives. Using stem cells as models of disease will help us understand the underlying causes of disease and likely aid in the development of drugs to treat those diseases. For the potential of stem cells to be realized, California researchers need the personnel to develop them into viable treatments. Therefore, the raison d'etre for the proposed program is to provide training to the next generation of researchers in stem cell biology, gene therapy and regenerative medicine capable of advancing the development of new methods of treating human disease. The breadth and depth of the stem cell biology, gene therapy and regenerative medicine research programs, which have already made important advances and secured significant funding from CIRM, will act as the core around which all training will be organized. Anticipated benefits of our Training Program to the Citizens of California include: creation of a training program that will attract the best and brightest minds to the state; development of new cell-based treatments for a variety of diseases and disorders; generation of new techniques for using stem cells (and derived cells) to deliver drugs or other agents to tissues, thereby developing new treatment methods; development of methods of using gene therapy to treat human diseases; improved methods for understanding normal development and environmental risks to the early embryo; improved methods for detecting and understanding effects of toxicants in the environment and workplace; improved clinical trial methodology that will directly impact human testing of stem cell and gene therapies; development of new improved methods for developing and testing drugs for treating disease; transfer of new technologies and intellectual property to the public realm with resulting IP revenues coming into the state; creation of new biotechnology spin-off

	companies based on generated intellectual property; creating interdisciplinary research teams that will have a competitive edge for obtaining funding from out of state; development of researchers and clinicians that will establish clinical research programs in the state; and, creation of new jobs in the biotechnology sector. It is anticipated that the return to the State in terms of revenue, health benefits for its Citizens, job creation, and revenue, will be significant in the long term.
Funds Requested	$5,000,000
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation of the GWG." Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 98

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	97
Median	98
Standard Deviation	2
Highest	100
Lowest	90
Count	14
(85-100): Exceptional merit and warrants funding, if funds are available	14
(1-84): Not recommended for funding	0

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 14	• An excellent proposal in every way - almost perfect; a great prior CIRM Scholars track record will be expanded and extended by this program. • The proposal is to build on previous training programs supported by CIRM, and other training grants, to develop scientific leaders in stem cell, gene therapy and regenerative medicine fields. The program will be administered through the stem cell research center, and will have an emphasis on basic and translational research in stem cell biology broadly defined, awareness of patient needs and preparing trainees to act as 'ambassadors' for the stem cell field. • The institution has an outstanding stem cell program in place. The institution has expertise in numerous areas of stem cell research including neuroscience, skin, cancer and other areas. • This is a well-described program that, based on the information in the application, will provide exceptional opportunities for the fellows in the program. • The program has the possibility of supporting any matriculating URM fellows since the institution is a minority and Hispanic serving institution. • The institution is designated as a Minority-serving, Hispanic serving, and Asian American and Native American Pacific Islander-serving institution. • Each trainee will be assigned a formal research mentor AND a clinical mentor, which is an excellent plan.
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**

Yes: 14	• The training program is well planned and features an outstanding group of potential mentors across several departments. The clinical co-mentors plan (and vice versa for the clinical trainees) will ensure that all trainees directly experience the application of advances in stem cell research in the clinic. The co-mentors will facilitate 'shadow' interactions with patients, and there are particularly good opportunities with the Alpha Stem Cell Clinic, which is within the institution. • They have used their experience with prior CIRM training support and NIH T32 support to provide meaningful direction to guide the current program. This includes: a focus on mentorship as a key pillar of training; a focus on 'soft skills" in the education of trainees (communication, conflict resolution, management, and skills development); and active involvement of clinical colleagues; a focus on translational research; and increased community engagement and outreach. • All scholars will have both a clinician and research mentor, so they will have bench-to-bedside experiences/perspectives. • A major goal is broadening participation in stem cell research and includes a strong plan for how it will do so. • Well developed, reasonable size, flexible curriculum. • Very strong patient engagement activities with 4 requirements. • IDP required. • Outstanding leadership. The program director led the first two CIRM Stem Cell Training grants at the institution. • Program will have an internal steering committee as well as an external advisory committee. • Likely to increase diversity of participants in stem cell research (DEI contributions of mentor & candidate included in selection process).
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 14	• The local infrastructure for training in stem cell biology and regenerative medicine is outstanding. Current administrative staff will provide support for the program, including a 0.5 FTE program coordinator; the stem cell research center will be organization 'hub' of the program, which is sensible since it serves to coordinate all stem cell related activities at the institution – also houses core facilities for stem cell research. • Program structure, leadership, institutional context - no doubt this program will succeed. • They have demonstrated both the will and resources to make this a successful program. There is an exceptionally strong conceptual commitment of the institution to this program, but more substantially, there is a substantial monetary commitment of several institutional components amounting to $828,582. • $825K in support for this program will be provided (i.e., cost-share). • Outstanding selection of coursework. • Includes a new course on ethics, legal and social implications of stem cell research (with another institution). • Should have asked for more training slots.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 14	• Previous CIRM Scholar support enabled training of 73 scientists, in 40 different labs (two phases of funding from 2005-2015) – 38 predoctoral trainees, half remained in academia and one third continued in industry or clinical research. 25 postdoctoral trainees – 11 in academia, 11 in industry. All 11 clinical fellows remained in clinical medicine. • Their track record for prior CIRM training programs and an NIH T32 is outstanding. • The institution has an extensive training record (previous CIRM funds) and is an outstanding environment to perform all types of research. • Outstanding outcomes. Students were extensively tracked post-training. • Prior CIRM training support. Program trained 73 students in 40 labs. • Excellent plan is in place to recruit trainees. • Could increase trainees - well done proposal.
No: 0	*none*

Application #	EDUC4-12782
Title (as written by the applicant)	CIRM Scholar Training Program
Public Abstract (as written by the applicant)	This CIRM Scholar Training Program will directly impact in multiple ways the educational opportunities of scientists and physicians in the context of stem cell biology and the application of stem cell technologies to the emerging field of regenerative medicine. First, our program educates MS, PhD, and dual degree MD/PhD candidates in a didactic setting through a curriculum specifically designed to provide insight into the scientific history and current research leading to new information about stem cells and their biology, tissue maintenance and repair, and engineering of biologically functional organs for eventual clinical use. Second, we provide laboratory-based research opportunities where students can explore their own ideas under the mentorship of accomplished scientists and physicians. Third, we provide training for post-PhD and post-MD scientists to advance them toward establishing independent careers in stem cell biology, regenerative medicine, cancer research, and related fields of study. Our training program includes robust educational activities in the context of a university setting that includes several hospitals, bioengineering and bioinformatics programs, and 14 distinct PhD training tracks. Our PhD training program begins with one year of classroom training in stem cell biology, regenerative medicine, genetics, and developmental biology plus a seminar series and directed journal club which focus on emerging research. Students rotate through multiple active research laboratories and contribute to ongoing studies as they decide the laboratory and mentor with whom to pursue their thesis research. Postdoctoral trainees may audit courses but are mainly devoted to their own research projects which will culminate in publications and eventual employment in academic medical centers, biotechnology companies, or science policy positions. Postdoctoral trainees benefit from this program by the robust stem cell community and its various activities, the opportunities to participate in mentorship of students as well as having faculty to mentor them, and the networking connections that will help secure future academic or industrial jobs. We believe that diversity is central to success and strive to maintain a group of predoctoral and postdoctoral trainees that is both highly qualified and diverse. Our trainee selection process considers family background, personal obstacles, and other mitigating circumstances that highlight everyone's personal accomplishments; we believe this holistic approach is essential to the educational process. Our graduate program is highly successful, with a track record of successful degree completion in ~5 years and subsequent employment in science-related careers in stem cell biology and regenerative medicine. Our trainees have published many hundreds of scientific studies in prominent journals and have contributed to advancement of basic research as well as clinical applications of laboratory-based discoveries.
Statement of Benefit to California (as written by the applicant)	Our CIRM Scholar Training Program provides many benefits to the citizens of the state of California who generously fund CIRM through their tax dollars. First and foremost, our program has already contributed and will continue to enhance the core mission of CIRM: To accelerate the development of cellular-based therapies that will address unmet medical needs of the citizens of California. CIRM Scholars funded in previous cycles contributed major advances that have already been integrated into new therapies for many forms of cancer as well as a variety of genetic diseases. Our program will train the next generation of scientists and enable further medical breakthroughs that would be delayed for years in the absence of CIRM support. The trainees that we will mentor through classroom exposure to stem cell biology and laboratory research in cutting edge technologies promise to continue the trajectory already established by the scientists previously supported by our CIRM Scholars training funds. Many of our past trainees have moved on to independent careers in academics, biotechnology, direct patient care, and science policy roles where they continue to push the boundaries of what can be achieved through high quality scientific research. An additional benefit to the state of California and its citizens is economic: our CIRM Scholar Training Grant will enable a diverse workforce of early-career scientists to contribute to the major impact that CIRM has enabled for California's economy. Each trainee will work with skilled life sciences research technicians who will be hired because of the need for technical support in the projects pursued by our trainees. Many supplies for the research mission will also be purchased from California-based businesses, with a tremendous impact on the economy. Finally, many of our trainees will go on to find employment within California, working in universities, private companies, government, and other areas as a direct result of funds provided by the CIRM initiative. Our training program will help to build an ecosystem in which the important research in stem cell science can be rapidly translated to clinical trials

	and eventual standard of care practices that would be severely delayed in the absence of consistent and stable sources of funding for the future scientific workforce of California.
Funds Requested	$4,974,073
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation of the GWG." Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 95

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	95
Median	95
Standard Deviation	2
Highest	100
Lowest	92
Count	13
(85-100): Exceptional merit and warrants funding, if funds are available	13
(1-84): Not recommended for funding	0

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 13	• Yes, this program is very likely to provide positive impact on trainees' career development. The proposed program will provide strong core stem cell courses (5 courses) and this program has outstanding core faculty members, who are leaders in the stem cell research field. • The proposed training program will accelerate the delivery of stem cell therapy because many core faculty members are holding MD and PhD and are physician scientists. Therefore, trainees will not just do basic fundamental stem cell research. Even for these labs led by non-physician scientists, many of their current projects are translation-oriented. • Publications of past CIRM trainees are of high quality in outstanding journals pushing the frontiers of stem cell research. • The institution has an exceptionally strong record of training graduate students and postdocs who build successful, productive careers in stem cell relevant work in academia, as well in healthcare and for-profit sectors. • The track record shows strong commitment to stem cell research and translational applications in medicine and industry • Track record speaks to impact. • The institution recruits diverse trainees from local schools, national and international applicants. • Some concerns about the potential to include scholars across the diversity of California's population. • This program proposed several strategies to increase trainee diversity: 1) requiring admission committee members to take anti-bias courses; 2) including a consideration of diversity during their phase 2 admission. It is not clear to this reviewer whether these two strategies would substantially increase trainee diversity since these two strategies are not exceptionally novel.
No:	*none*

0	
GWG Votes	**Is the program well planned and designed?**
Yes: 13	• This program is planned very well. All trainees will have the opportunity to receive world-class mentorship from leading stem cell scientists. Furthermore, the trainees will also have the chance to participate in the use of stem cell products for treating human diseases. • Exceptionally clear and well designed. • 5 stem cell core courses provided, including materials in regenerative medicine and translation medicine. • Comprehensive course work plan. Course evaluations in the past year of the program operation average between 4 and 4.5 on a 1–5 point scale. • Applications of stem cells in medicine, business and law course is novel and successful since several CEO and business leaders were past trainees. • The frontier of stem cell research will be covered by Seminar Series and Journal Clubs. • This program provides a very good mentoring plan. This reviewer especially liked the idea of matching trainees with faculty who may not be their PhD thesis advisor to assure unbiased mentoring experiences. • This program required the core faculty to enroll in annual mentorship workshops. • This program provided assessment from the trainees about their experiences with their mentors. • Regular Town Hall meetings to allow all trainees (predoctoral as well as postdoctoral) to provide evaluations of other aspects of the training program. • Three active programs with a local children's hospital encompass stem cell transplantation in oncology, hematology, and immune disorders. Educational activities describing current transplant protocols, innovation developed at the institution, and ongoing Phase 1/2 clinical trials. • Exceptional training program with an outstanding publication record for trainees. • Exceptional program in terms of training opportunities, coursework, and mentoring (IDP included). • The institution hosts an 8–week summer program to match outstanding local high school students in research labs in the life sciences and bioengineering. • Summer internships are funded in collaboration with local donors. They partners with diversity high school interns from a nearby school district and institution faculty members for 8-week research rotations. • This program proposed a well-considered DEI plan. This program has implemented several recruitment activities for enhancing DEI, including Fee Waiver Program, diversity events and initiatives. • Patient/Community outreach and engagement opportunities are described, but not how trainees will be involved or what outcomes are expected for the trainees and for the patients/communities impacted. • It is not clear to this reviewer about how the trainees will engage with patients. This proposed program did not write detailed plan for these activities, nor how these activities might be valuable to the trainees. • This proposed program did show in the attached excel file about current status of their trainees. This program will benefit it if it tracks all of their trainees during a long-period of time. • DEI efforts are institutional, not program specific.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 13	• Outstanding, unmatched resources. • Exceptional resources, leadership, and track record. • Robust training and entrepreneurial training. • The CIRM Scholar training program and External Advisory Committee are outstanding. • The institution's stem cell program recruits the best of the best trainees. • Absolutely. This program will have access to all the necessary resources. The institution will be able to provide the best infrastructure for generating, expanding and differentiating stem cells. • The program director is appropriate for leading this program because they have been co-director for this program before and because their own research is related to stem cell biology. • The leadership team will be supported by two associate program directors and stellar executive committee members who all have great experiences with training successful stem cell scientists. • Yes, the institution provides strong support to this program. The track record showed that this proposed program will be able to recruit and train the proposed numbers of trainees. • Institutional commitment is solid, achievement top tier, exceptional training assured.

	• There are appropriate mechanisms for recruiting PhD students with diverse backgrounds. However, no details about recruiting postdoctoral trainees with diverse backgrounds. • DEI efforts do not seem to be moving the needle on the students in stem cell relevant research (based on supplement).
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 13	• Publications of past CIRM trainees of high quality in top tier journals. • Pre-doctoral, postdoctoral, and clinical trainee outcomes have been outstanding. • Yes, based on the information provided. Many of the trainees are still doing academic work, and some of them are doing biotech industry work. Some of them became professors, including a Harvard professor and a co-founder of a company critical for developing COVID therapeutics. • Outstanding entrepreneurial spirit and experience. • Previous CIRM training awards supported 99 trainees most of whom are pursuing biomedically relevant careers. • Track record particularly with diversity trainees is outstanding.
No: 0	*none*

Application #	EDUC4-12753
Title (as written by the applicant)	Training Program in Stem Cell Biology
Public Abstract (as written by the applicant)	The Training Program in Stem Cell Biology (Training Program) will take advantage of the exceptional depth and breadth of the university research environment to provide a holistic training in Stem Cell Biology. This Training Program will leverage faculty that are among the leaders in the world for this area of biology and cutting-edge technologies and facilities that accelerate discovery. Trainees will receive mentorship and guidance to enable them to move on to shape the future application of stem cells towards clinical priorities. In addition, trainees will work in a supportive environment that encourages individual meetings with any of the program faculty, and will be able to gain broad interdisciplinary training, training in mentoring and communications, and be exposed to diverse career options. The trainee's faculty mentor plays the central advising role, and mentors are selected based on their history of training fellows in addition to the quality of their research, productivity, and funding status. Finally, the program director and the executive committee will maintain an open-door policy and meet with trainees on short notice. Their considerable mentoring experience in their own laboratories or as training grant directors and presence on many thesis committees have provided them with significant experience in guiding trainees at all levels. Committing resources to the study of stem cell biology will accelerate novel treatment strategies to improve the human condition. Importantly, this new Training Program will provide resources to learn the latest methods and stem cell models, as well as sections on Ethics, Regulatory, Communications Intellectual Property, Development. Fellows will be exposed to cutting-edge approaches from other fields, to ensure they are fully versed in the science behind stem cell biology, new technologies, can perform such work under the highest ethical and regulatory standards, and be able to disseminate and educate the public on the importance and impact of their work. Furthermore, this program will make diversity a priority. The Training Program will recruit trainees from under served backgrounds and under served scientific disciplines, as we feel this is the best way to make innovative insights that not only drive the field forward, but also lead to important clinical advances. The focus of this Training Program is a deliberate effort to educate a new generation of scientists to drive the promise and implications of this critical emerging field of human biology into the future and effectively identify and address the field's limitations.
Statement of Benefit to California (as written by the applicant)	The Training Program in Stem Cell Biology will provide trainees with opportunities to study the latest advances in stem cell biology, development and disease modelling, present their own work in a setting in which they can obtain constructive criticism, interact with their peers and training faculty in formal and informal forums, and meet leaders in the field. Our goal is to produce scientists at the Predoctoral, Postdoctoral and Clinical levels that are fully versed in their primary scientific discipline and fluent in the whole panoply of issues that arise in the study of stem cell biology. We expect our trainees to become leaders in the field of stem cell biology that are well-versed in stem cell ethics and entrepreneurship, and communicate effectively about their work. As a result, we have every expectation that our trainees will be able to fully translate stem cell discovery into stem cell therapy. Data suggests that the majority of our trainees stay in California to continue their careers. As a result, this program will contribute to the enrichment of the scientific community in California, and create a cadre of scientists well-versed in issues particular to stem cell biology such as disease modeling, ethical use of stem cells, and clinical translation of stem cell technology. As California becomes a hub for stem cell biology, the Training Program in Stem Cell Biology will serve to promote the latest technologies and advances to create viable clinical therapies while doing so in an equitable and ethical manner.
Funds Requested	$5,000,000
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation of the GWG." Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 95

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	94
Median	95
Standard Deviation	2
Highest	97
Lowest	90
Count	15
(85-100): Exceptional merit and warrants funding, if funds are available	15
(1-84): Not recommended for funding	0

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 14	• The goal of the Training Program in Stem Cell Biology is to offer a thorough and critical background in stem cell biology to its trainees, by engaging outstanding mentors in the program and launching a coordinated training-grant specific series of activities. The program builds on a prior CIRM program that was highly successful and was continued institutionally. • Outstanding proposal. Strengths include: broad training program, outstanding coursework plan. Strong track record in past CIRM training programs. Outstanding faculty with broad expertise relevant to this training program. No weaknesses. • Strong program design with solid curriculum and the usual complement of seminars and workshops. • This is a very strong program at an excellent campus, with a renowned research environment. • Students are exposed to leading-edge approaches from multiple fields, with opportunities to learn all of the newest approaches in outstanding successful laboratories.
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 14	• The curriculum is very well designed, and includes a Stem Cell Biology and Regenerative medicine course for all trainees that comprehensively covers stem cell biology, as well as translation to the clinic, and IP issues. The course will also require each trainee to write a 'grant' describing a novel question in stem cell biology that they propose to address, and to defend orally. • The students will also organize a seminar series featuring invited lecturers, and will take one elective course or workshop (the menu of choices is extensive). • The program is extremely well designed with high expectations that are clearly defined. • The coursework is very well developed, although with a smaller number of required courses than some of the other programs. This is made up for with a lot of elective courses and workshops. • There are strong patient engagement opportunities. • The mentoring is well-developed. • Program director and faculty are outstanding. Broad span of course work highly relevant to stem cells and regenerative medicine. Expectations are clearly defined for trainees at all levels with excellent detailed mentoring program. • Strong institutional DEI program in place – will have implicit bias training for program leadership (including trainee selection). • Good track record of increasing participation of URM. • The previous program represented the diversity of the student body but not that of the local population or that of California in general. This led to a major effort in recruiting much higher proportion of underrepresented minority students. The goal will be to have trainee diversity reflect

	that of the population of California. To do this the have implemented multiple active recruitment strategies. ● Concerns about outreach (opportunities, but no requirements) and mentoring for what the proposal calls "alternative" careers. ● Generally - describes many possible experiences for trainees, but not expectations for trainee's engagement or expected outcomes.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 14	● The program will train up to 5 pre-doctoral, 4 postdoctoral and 3 clinical fellows annually. There is a robust plan in place for trainee recruitment, for which administrative support will be provided institutionally. ● Predoctoral candidates will be drawn from the umbrella graduate bioscience program – the students will apply beginning in the second year of the PhD program; the focus will be progress on research, success in coursework and letters. ● The reputation of the previous program and outstanding participating faculty mean that the recruitment plan will be successful. ● Large and distinguished faculty. The program director has a history of leading other training programs as well as being a distinguished faculty member in stem cell research. ● Solid program with expected components. ● The program clearly has all the necessary resources. ● The leadership team has demonstrated its qualifications with its past achievements. ● The institution is strongly committed and the track record is outstanding.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 14	● The outcomes from the previous program incarnation are impressive; the program was the top biomedical training program on campus, training 89 fellows, with many pre-doctoral and postdoctoral scholars moving on to academic positions, or senior positions in biotech. ● A nice demonstration of how the program created a great training environment at the institution is that 6 of the previous fellows are now on faculty at the institution and one will now be participating on the executive committee of the new program. ● Well-described successful history in prior training programs. ● Excellent track record; recruiting graduates of the program to executive board. ● Successful prior CIRM award.
No: 0	*none*

Application #	EDUC4-12812
Title (as written by the applicant)	Scholars Research Training Program in Regenerative Medicine, Gene Therapy, and Stem Cell Research
Public Abstract (as written by the applicant)	The proposed CIRM Scholars Research Program is designed to equip the next generation of basic and clinical scientists with the expertise and motivation to make major strides in the fields of regenerative medicine, stem cell research, and gene therapy. To achieve this goal and fill the gap of needed experts in these fields in California requires robust training at multiple levels of education. The focus of our program is graduate students, post-doctoral fellows, and clinical fellows. Trainees from each of these pools will be selected from diverse ethnic backgrounds based on their prior scholarship, their mentor, and their proposed research. Scholars will be selected from a wide range of disciplines such as cell and molecular biology, gene editing, immunology, organismal biology, computational biology, synthetic biology, bioengineering, therapeutic sciences, and clinical trials. They will perform their research under the mentorship of our institution's world class faculty in regenerative medicine, stem cell research and gene therapy. They will have access to the remarkable physical and intellectual infrastructure of the institution. In addition to funding the selected trainees' research, the proposed program includes a cutting-edge curriculum combining coursework, community outreach, education activities, and career mentoring. Coursework about the science, clinical application, and ethics of stem cells, gene therapy, and regenerative medicine will be complemented by rich opportunities for in-depth learning about specific diseases through conversations with patients, seminars and informal discussions of stem cell and gene therapy research and clinical strategies with scientists and physicians, as well as debates about the ethical, legal, and social implications with leading bioethicists. Scholars will also gain important skills as educators by teaching high school students, undergraduates, colleagues, and the broader community about the potential of stem cell and gene therapy in improving the population's health. Scholars will be closely mentored with multiple opportunities to gain training in skills that will enable them to pursue a broad array of career paths from academic research to industry-based product development to clinical practice to policy, all critical to enabling the promise of regenerative medicine. Emphasis will be placed on promoting diversity, equity, and inclusion among the scholars through multiple dedicated efforts at recruitment and retention. The strength of our institution's training environment, as evidenced by our track record with prior trainees, combined with the strength of the proposed program, should ensure success at producing leaders in all these areas.
Statement of Benefit to California (as written by the applicant)	We envision that the citizens of the state of California will benefit in many ways from our university's proposed Scholars Training Program for graduate students, postdoctoral fellows, and clinical scientists. Collectively, the basic research, translational strategies, and clinical therapies that emerge from the work of our university's California Institute for Regenerative Medicine (CIRM) funded trainees will be an important stimulus to the state economy, particularly the biotechnology sector and associated medical enterprises. Additionally, specific groups of individuals will directly benefit from work that is focused on cell-based therapies for repairing tissues and organs whose damage leads to common medical conditions, for example, diabetes, cardiovascular disease, Parkinson's disease, paralysis and/or immune dysfunction. On the way to achieving the CIRM's ultimate goals in terms of novel regenerative therapies for patients, we envision that numerous other benefits will emerge. For example, human embryonic stem cell (hESC) systems are powerful tools for unraveling the molecular basis of human development, which remains largely a black box. A fundamental lack of understanding regarding the mechanisms that give rise to the hundreds of cell types that form tissues and organs makes it extremely difficult to discern why these processes sometimes go awry, leading to birth defects and/or setting the stage for many diseases. Additionally, novel therapies for other medical conditions are also likely to emerge. In this regard, some forms of cancer are now thought to be associated with the proliferation of stem cells that carry mutations in genes that promote their self-renewal, rather than differentiation and integration into the compartment that they normally occupy. Other important applications include drug development. For example, hESCs and their differentiated progeny could be used to screen promising compounds for efficacy, safety and/or toxicity. Where will the workforce come from that will enable this revolution in how the medical establishment approaches patient care? Stem cell and gene therapy is a rapidly growing field that must be rapidly populated with scientists and clinicians who are specially trained in all aspects of regenerative medicine, a new specialty. This necessity makes the funding of CIRM-sponsored training programs especially critical for institutions such as ours that have the ability to make important research discoveries and translate them into clinical

	therapies. Our university has a long and distinguished history of training leaders in science and/or medicine who easily traverse the boundaries between academia and industry. Our past successes strongly suggest that our CIRM-funded training programs will be equally successful. Accordingly, we expect that our trainees will become leaders in the field.
Funds Requested	$5,000,000
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation of the GWG." Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 92

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	92
Median	92
Standard Deviation	3
Highest	95
Lowest	88
Count	14
(85-100): Exceptional merit and warrants funding, if funds are available	14
(1-84): Not recommended for funding	0

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 14	• The CIRM Scholar Research Training Program will build and expand on a strong history of research and training. The institution has been in the forefront of stem cell research for much of its history. This history coupled with new program components should lead to very positive impacts on the fellows' careers. • The proposed program builds on two previous CIRM Training Grants as well as the deep history of advances in stem cell biology at the institution. The new program will be overseen by an institute for regeneration medicine and stem cell research, and will support a cadre of graduate students, postdoctoral fellows and clinical fellows, who will be selected based on their promise to make an impactful contribution to stem cell and gene therapies. • Outstanding investigators with many founded in stem cell work by CIRM. • A lot of support groups and networks to support students. • All faculty required to take mentorship training. • Will provide trainees with a strong research context & resources, including many CIRM awards. • There is no clear inclusion and support of URM.
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 14	• The CIRM Scholar Research Training Program will provide interdisciplinary training in translating basic science into interventions in regenerative medicine. The program is designed to equip trainees with the skills needed to dissect human disease and to develop therapeutic approaches to

	treat patients using the concepts of developmental biology, stem cell biology, genetic manipulation, therapeutic application, regulatory/ethical issues along with their application to clinical practice. • The program has a number of specific objectives, including self-directed research, solid grounding in basic and stem cell biology, appreciation of the ethical and social implications of stem cell and gene therapy-based research. The program will exploit the institution's position as a post-graduate only university and will take full advantage of the many university-wide efforts to engage diverse scholars in stem cell research. • Well-planned program. • Interesting postdoc interview day planned for program recruitment of postdoctoral fellows (not just relying on individual research mentors). • Trainee selection includes consideration of contributions to DEI based on individual's background or research topic. • Required patient engagement activities embedded in the program. • Strong mentoring: mentor & DEI training required for all mentors; IDP required; CIRM alumni mentoring. • It appears that the postdoc mentoring will be exclusively by the research mentor - a committee structure would better serve the trainees. • Concern: plan to reserve a DEI slot instead of embedding consideration of diversity throughout the selection process. • Program needs more attention to execution of DEI goals. • Systemic negative attitude to diverse scholars: "Remarkably, these [diverse] trainees showed similar success as counterparts…" The authors should be alerted about the need for asset-based perspectives toward all students. Thinking that a URM student is "remarkable" because they performed as well as majority students leads to subtle acts of exclusion (microaggressions) that affect the climate for diverse students. • Would reconsider how results are presented regarding diverse students; micro aggression to state it was surprising regarding the success of the diverse candidates to be similar to the others.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 14	• The curriculum is 'trainee-centric' and based on principles established over the past ten years. Trainees will spend more than 80% of their time on research in a lab or clinical setting. Course work requirements will be determined on a case-by-case basis, which is an interesting, personalized approach. Scholars entering the program with little stem cell biology background will attend a patient-facing course, designed for the program. • A new course will also be developed, focused on the translation and application of regenerative medicine from bench to bedside. • The program is well-conceived and prior history shows that it is achievable.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 14	• With two previous training grants, 64 trainees were supported, including 27 PhD students, 23 PDFs and 14 clinical fellows – the outcomes are impressive with trainees pursuing careers in science at many levels. • Two prior CIRM Type I Comprehensive Training Grants were successful in funding 64 trainees (27 graduate students, 23 postdoctoral fellows, and 14 clinical fellows). Of these, 62 completed training (one graduate student finished with a master's degree and one postdoc left research to go into regulatory affairs) for a 97% completion rate. Trainees published 309 papers (134 first author papers) based on their CIRM-funded research for an average of 4.8 papers per trainee (2.1 first author). • Outstanding. • Excellent publication history of trainees. • Many fellows have remained in academia or industry. It is hard to determine how many remain in California or how many are directly involved in stem cell research.
No: 0	*none*

Application #	EDUC4-12821
Title (as written by the applicant)	CIRM Training Program in Stem Cell Biology and Engineering
Public Abstract (as written by the applicant)	The CIRM Training Program in Stem Cell Biology and Engineering will provide an integrated program of laboratory training, instruction and outreach to prepare students and postdoctoral scholars for research careers in stem cell, gene therapy and regenerative medicine fields. The program will support 5 predoctoral and 5 postdoctoral trainees per year, with a specific focus on interdisciplinary training that emphasizes basic discovery research in stem cell molecular biology as well as bioengineering related to stem cells, gene therapy and regenerative medicine. Trainees will be required to complete two exiting, high- level graduate classes: 1) Stem Cell Biology in Health and Disease; 2) Stem Cell Ethics. In addition, they will complete one of the following four graduate courses: 1) Therapeutic Development; 2) Drug Design; 3) Research Data Management; or 4) Research and Scholarship Ethics. Trainees will form teams to implement outreach activities to the local community, via interactive programs to involve K-12 schools, community groups, and local non-profit organizations. We will partner with local hospitals and patient advocacy groups to engage with patients. The Program will recruit and promote interactions among trainees from diverse backgrounds and disciplines. 19 potential mentors from a range of disciplines have committed to participate in the program, which will prepare these scholars to be future leaders who will go on to develop therapies for unmet medical needs.
Statement of Benefit to California (as written by the applicant)	Chronic incurable disease inflicts a tremendous burden on the citizens of the state of California, leading to a loss of lives and costing billions of dollars in health care expenses. We lack effective treatments for heart disease, Alzheimer's disease, Parkinson's disease, diabetes, cancer and blinding diseases such as macular degeneration and retinitis pigmentosa. New treatments are needed, and cell and gene therapies provide immense potential that goes beyond traditional small molecule drugs and biologics. The proposed training program will educate postdoctoral scholars and graduate student scholars in the fields of stem cell biology, gene therapy and regenerative medicine. Our program will emphasize interdisciplinary training, at the interface of biology and engineering, and include cutting edge coursework, laboratory training, and outreach and patient engagement activities. The Program will recruit and promote interactions among trainees from diverse backgrounds and disciplines and prepare these young scientists to be tomorrow's leaders in developing treatments for unmet medical needs.
Funds Requested	$1,924,497
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation of the GWG." Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 91

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	92
Median	91
Standard Deviation	3
Highest	95
Lowest	88
Count	14
(85-100): Exceptional merit and warrants funding, if funds are available	14
(1-84): Not recommended for funding	0

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 14	• This is an excellent program, providing multiple opportunities for individuals to become well trained stem cell scientists. The institution has an outstanding faculty, with a strong research presence in the fields of stem cell biology, gene therapy and regenerative medicine. They also have a center for stem cell biology and engineering since 2008. • Very well designed program with strong track record from previous CIRM education awards. • Members of the program will have the opportunity for training in a broad range of laboratories, on topics ranging from molecular biology of stem cell function, through bioengineering studies and including a dedication to regenerative medicine. • The institution is ranked in the top ten in the U.S. News & World Report of top public schools, and top ten on the best ethnic diversity ranking among public universities. It also ranks in the top ten on the list of top performers on social mobility. • Great combination of basic science and tissue engineering. • Great resources in material science. • Trainees get to design own outreach programs. • Well-connected to CIRM Bridges. • Yes, although there are no direct connections with a clinic, several team members have been closely involved in development of cell therapy products, also strong links with industry. Program leadership provide excellent examples of how scientists can contribute to translation. • Special program for students with disabilities, and very strong pipeline programs.
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 14	• This is an excellent program in many ways. The faculty is outstanding and diverse in their areas of expertise. The coursework is extensive, with required courses in stem cell biology, stem cell ethics, therapeutic development (with options for studying drug design, research data management). There are also optional courses in multiple related areas. There will also be a monthly stem cell Roundtable for trainees and other students and postdocs to present their research. • Trainees have access to an excellent group of mentors covering a diverse range of focus areas. • Coursework extensive and multiple additional workshops. • Strong curriculum with good track record of ongoing improvement. • Courses in basic biology, tissue engineering, materials science, gene therapy, reg medicine, ethics, therapeutic development. • Trainees will mentor CIRM Bridges students. • They are teamed up with Americans for Cures to provide a comprehensive program to fulfill patient engagement requirements of the Bridges programs. The curriculum will be developed together with the AFC to draw on their extensive experience with patient advocacy and community outreach. • There are multiple workshops, including advanced training in outreach. There's an expectation of 15 hours of time per trainee over the course of the year in outreach activities. There will also be a workshop presenting the outreach experiences. • Outreach efforts required and integrated into the trainees' training. • Interesting approach to outreach, trainees participate heavily in designing their experience, working with Americans for Cures. Strong support for trainees while they build their outreach activities. • IDP required. • All of the trainees in the previous years of the program have been tracked and all are doing very well with advanced positions in multiple fields, including the development of novel therapeutics, cell therapies, gene therapies, biologics and small molecules. • They will partner with multiple organizations to recruit a diverse range of students from multiple different members of the population. This includes an active strategy to increase outreach to students with disabilities. • The institution has a strong investment in multiple summer undergraduate research programs designed to particularly increase representation of students from underserved communities. • Every faculty member is required to contribute annually to diversity outreach and recruiting.

	• Good track record in DEI, the institution is designated an Hispanic Serving Institution.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 14	• Well resourced institution, strong leadership, good track record. • All the necessary resources and partnerships are in place, with local connections to such organizations as the foundation for fighting blindness, a local hospital, the Parkinson Association, the Alzheimer's Association and many others. • The team is extremely well-qualified. There is a well-developed mentoring plan, with consistent mentoring throughout the training. There will be a clear timeline of milestones, and the required development of an individual development plan working with individual mentors and departmental supervisors. • There's a strong emphasis on writing and speaking. There is also a detailed assessment plan. • The program director is a distinguished researcher and co-director of the center for stem cell biology and engineering. The leadership team also includes multiple other outstanding scientists. • Great team with some outstanding scientists, strong academic departments support the effort. Center for Stem Cell Biology and engineering, and core facilities in materials science and instrumentation. New mentors recently added to program. • The program director is a leading stem cell researcher and experienced program direction. Advisory Board and remainder of team first rate. • Yes, good record of training, and a program manager has been appointed. • The track record of the program has been excellent. • Acknowledgement of need to make better strides in DEI and reasonable plans to do so - but would benefit from looking more closely at the Scholar selection process (more so even than the recruitment process)
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 14	• The previous program trained 27 Scholars, including 12 predoctoral and 15 postdoctoral Scholars. Most of the alumni are building careers in academia and industry, with many serving in leadership roles in stem-cell relevant research efforts. • There's been a high record of success in previous programs. • Trainee outcomes excellent; diverse placements in industry and academia.
No: 0	*none*

Application #	EDUC4-12804
Title (as written by the applicant)	Interdisciplinary Stem Cell Training Grant
Public Abstract (as written by the applicant)	Our proposed training program serves as a catalyst and foundation for expanding stem cell biology efforts. We are aided in our goals by the unique local scientific community, which has become a premier location in the world to pursue innovative biomedical research. We have an unusually interdisciplinary and highly collaborative scientific community where research and training collaborations have flourished across traditional institutional and scientific boundaries. Our goal is to train basic scientists, physician-scientists, and bioengineers who will pursue innovative stem cell and regenerative medicine interdisciplinary research driven by their understanding of Basic and Clinical Sciences merged with advanced engineering and bioinformatic methods. Trainees will have access to state-of-the-art stem cells and gene therapy facilities, plus the opportunity to witness how basic fundamental discoveries can be translated into the clinics. In addition, our institution is unique for its combination of assets that are committed to stem cell and regenerative medicine research, many of which qualify as "one of the first" in the nation, including i) a stand-alone Division of Regenerative Medicine within the Department of Medicine; ii) an active outpatient facility and an inpatient capacity with the Cell and Regenerative Medicine Service within the Medical Center system; iii) one of the original Alpha Stem Cell Clinics for clinical research, and iv) an existing course in Translational Regenerative Medicine that can contribute to a Master's Degree in clinical research or a certificate in translational research. We also give substantial exposure to quantitative, ethical, and theoretical approaches to biological and medical problems in regenerative medicine, including a collaboration with our new School of Public Health to enhance the positive impact and accessibility of new therapies for patients across broad socioeconomic and ethnic groups. Our approach is to build on each trainee's foundation of basic or clinical knowledge and provide: 1) Rigorous education in the principles and applications of pluripotent and adult stem biology in humans and model organisms; 2) Research training in evolutionary, computational, and bioengineering methods that can use stem cells to attack problems of basic and clinical science and eventually develop new therapies; and 3) Education in the ethical, legal, social, and economic issues associated with stem cell biology and regenerative medicine. Thus, future stem cell trainees at our institution are positioned to become leaders in this field in the upcoming years.
Statement of Benefit to California (as written by the applicant)	This training opportunity will bring the following benefits to California: 1-Training the next generation of stem cell biologists. The strength of our commitment to research training, the value of our experience, and the positive effect of strong mentoring is manifest in the success of our past group of CIRM trainees, who have published an outstanding volume of high-impact papers in the field, gaining excellent careers in industry, clinical endeavors, and academia, with many becoming faculty members themselves, thus extending the impact of the training program to new generations of scientists. Moreover, many of these past trainees have also received other prestigious prizes, awards, and fellowships, including name prizes, awards, fellowships, NIH K99/R00s, best dissertation thesis, best poster in meetings, etc. We have a total of 87 past CIRM trainees from 49 different mentors. Of all trainees, 57% of these were women, and 81% continue researching in the USA (including 72% in California). 2-Health and Economic Benefits. The work from our CIRM trainees has led to new treatment and several ongoing clinical trials (including spinal cord injury, different types of cancer, Alzheimer's Disease). Moreover, the work from our trainees becomes inventions and patents, many being licensed by our faculty-based spin-offs based in California. 3-Public communication and outreach. Californians will also benefit from our proposed dissemination and outreach activities. Our strong partnership with a TV media outlet has resulted in unique collaborations to produce high-quality, easy-to-understand, 12-15 minutes videos about stem cells and their applications. To effectively reach diverse populations, including non-English-speaking people and racial and ethnic minorities, these episodes are translated into both Spanish and Portuguese. A pilot video of this channel received a Telly Award for excellence in science communication and, another episode received another Telly Award in 2019. This initiative alone brought in over 1 million views across its first season and consistently ranked in the top position for programming across all of the participant institutions. We also established an online series aimed to stimulate expert conversation between a basic scientist and a clinician about emerging stem cell research and clinical strategies tackling a variety of diseases. This has become a trendy venue for our scientists to meet and answer questions from the public. The average attendance is about 300 people by

	zoom. All the videos are recorded and made available on YouTube. We will also reinstitute an annual Stem Cell Day celebration and bring trainees to present their work to the public.
Funds Requested	$4,992,446
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation of the GWG." Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 90

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	91
Median	90
Standard Deviation	1
Highest	95
Lowest	89
Count	14
(85-100): Exceptional merit and warrants funding, if funds are available	14
(1-84): Not recommended for funding	0

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 14	• Focus on research training with human pluripotent and tissue-specific stem cells to discover basic biological mechanisms, mechanisms of disease, and therapies. Extensive training in stem cell biology and related topics. • Program provides an excellent training in basic science and applications of stem cells. Students can work in a range of excellent laboratories involved in stem cell research. State-of-the-art facilities for stem cell therapies. • Broad, multi-disciplinary program with opportunities for research training in excellent labs in many different aspects of stem cell sciences, and broad exposure to translational research and therapy development. High probability for positive impact on career development. • Broad-based research by faculty in stem cell biology and its applications. Clear requirements for participating faculty. Collaborative efforts among three institutions for courses, outreach, retreat, seminars, and larger pool of faculty for mentoring. • Effective collaboration unites much of entire stem cell/regenerative medicine research community in the area to enhance education and research of trainees. • Part of a larger consortium of stem cell programs in Southern California with potential for high impact. • This proposal stands out in its focus on research that has clinical and engineering perspectives. • Strong institutional investment ($1M), so impact of CIRM funding will be extended further. • Excellent resources. • Could improve on community outreach as not really very active. • For having a Hispanic center of excellence, the diversity seems low.
No: 0	*none*

GWG Votes	Is the program well planned and designed?
Yes: 14	• Broad-based research by faculty in stem cell biology, organoids, tissue engineering, and its applications. • Well-planned programs with educational programs for trainees emphasizing stem-cell biology, but also ethics. • Solid program with all necessary components. • Students from a range of programs are eligible to apply for fellowship. • A great strength is the large number and diverse research focus areas of excellent labs in which trainees can work - circa 120 including the applicant institution and partner institutions. Strong emphasis on novel interdisciplinary projects, most with relevance to human disease conditions. • Excellent cross disciplinary projects. • Strong course program for both graduate students and postdocs/clinical trainees. Core stem cell and ethics course appears very well established since its initial development under a prior CIRM training award. Stem cell, organoid & computational "boot camp", offered as a modular laboratory course, also appears a valuable, unifying component of the training. • Modular boot camp to provide flexibility so trainees learn relevant stem cell techniques. • Organized stem cell journal club, monthly stem cell colloquium, seminar courses & symposia (e.g., Stem Cell & Gene Meeting at which trainees present annually), annual attendance at meetings such as ISSCR, & biannual retreats for CIRM trainees all add substantial educational value for trainees. • Engagement takes advantage of clinical/translational stem cell programs at multiple institutions in the area, so that all trainees are exposed to such activities. Stand-alone Division of Regenerative Medicine within Dept. of Medicine is a strength. • Each trainee has an interdisciplinary advisory committee comprising 3-5 members, and progress is reviewed in depth annually. Should foster individualized attention to career advancement. • Alumni mentoring, mentoring committee with clinical & engineering faculty, IDP and defined metrics for assessment. • Ongoing ethics training through annual course. • Direct interaction of trainees with patients/patient advocates appears possible but more sporadic and not clearly part of training program initiatives or requirements. • Although opportunities exist, program lacks a cohesive effort at patient engagement, trainee involvement with local industry, or biomanufacturing. • Outreach and patient engagement opportunities seem to be optional and loosely organized. • Rather weak patient/community engagement and outreach.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 14	• Quality and broad range of expertise of stem cell field investigators is impressive. Partnerships with other area institutions and companies with excellent stem cell programs also comprise a major strength. • Infrastructure is excellent. The institution and partners have first rate facilities/cores for: stem cell culture/reprogramming; organoid systems; molecular analysis; regenerative medicine technologies; drug discovery. • Institutional resources include a stem cell clinic, core facilities and new research space. • A required comprehensive annual stem cell and ethics interdisciplinary one-quarter lecture/discussion course covers major stem cells, their uses in basic science, translation, and clinical research and application. Emphasizes applications of hPSCs and covers range of topics from basic stem cell biology to organoids and tissue engineering. Ethical, legal and economic issues are addressed. • All trainees have a 3-5 person advisory committee, including, at minimum, a basic stem cell scientist, a clinical or translational scientist applying stem cells to a clinical problem, and a physical scientist or engineer interested in physical methods for stem cell manipulation is a nice personalized touch. • Program is open to trainees in a large number of departments which increases likelihood of a diverse population of trainees. • Program director is an expert on stem cells and neural development. They have made major advances related to neurodevelopmental diseases. The lab is well funded and research is highly cited. Program director has received numerous research awards and has trained a large number of individuals. The director has a diverse lab and places a priority on diversity.

	• The program director and co-director have excellent track records leading the stem cell training program at the institution. Their respective experience in modeling human developmental disorders in human stem cell-based systems, and in clinical research is nicely complementary and gives the program overall a good balance between basic and more applied stem cell science. • Institutional commitment includes major financial support for the training program. Multiple departments have cooperated successfully with an excellent track record in meeting achievement of objectives of prior CIRM training grants. • Significant institutional commitment. • Excellent program, but limited in outreach. • Major outreach effort involves TV media outlet. While this provides opportunities that may not be achievable in person and addresses challenges with high rates of COVID-19 infections, this is a suboptimal way to engage with patients or offer outreach. • Good collection of DEI activities, but no metrics are provided to measure success.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 14	• Track record is excellent. • Good track record from previous award; most trainees were from the US. • Track record includes 87 past CIRM-funded trainees among 49 UCSD mentors. Many individual examples presented of highly innovative, impactful research carried out by trainees. • Track record has been good. • 87 fellows with 72% remaining in California - only 8.6% Underrepresented trainees. • The program director acknowledges the limited success with diversity in the prior program. They have instituted outreach efforts which show promising results. The major challenge is for the participating labs to demonstrate a commitment to diversity and recruit a diverse group of students. Several actions are proposed to promote diversity involving overall institutional outreach.
No: 0	*none*

Application #	EDUC4-12813
Title (as written by the applicant)	A Multidisciplinary Stem Cell Training Program, A Critical Component of the [Regional] Educational Network
Public Abstract (as written by the applicant)	The institution proposes an educational program to train PhD candidates, postdoctoral scientists, & clinical fellows in cutting-edge translational stem cell biology & regenerative medicine. Our faculty direct a large stem cell research & teaching enterprise that comprises biologists, chemists, engineers & clinicians with extensive expertise in stem cell biology & in allied disciplines dedicated to stem cell-based therapies for cardiovascular, neurodegenerative, hematopoietic, skeletal muscle & metabolic disorders. The proposed 5-year program will feature the following: • Training 18 PhD students, 6 postdoctoral trainees & 2 clinical fellows, admitted on a competitive basis. • Mandatory lecture courses on Stem Cell Biology, Ethics, Modern Drug Discovery Technologies. • Courses in Biostatistics & Data Management/Informatics, drug discovery/development, & models of development, degeneration, & disease. • Journal clubs where trainees learn to critically evaluate published research. • Annual [program]-wide CIRM retreats. • Annual Stem Cell & Disease Symposia, where trainees present their work & meet patients & their families, patient advocates, & interested members of the lay community. • Annual Postdoc/Grad Student Symposia, where trainees present their findings & strengthen their scientific networking. • [Regional] Stem Cell Consortium monthly seminar series, where internationally-recognized leaders in stem cell biology present their latest research & interact with trainees. • Bedside-to-Bench Tutorials & Grand Round-like Sessions, where clinical cases are presented, & trainees are exposed to patient examination as well as an interdisciplinary discussion of clinical & biological aspects of diseases. • Professional development activities, including scientific writing & presentation, & leadership Institutional commitment to training is enthusiastic. The institution will support faculty mentors; instrumentation & lab space dedicated to stem cell biology & engineering; automated small molecule, siRNA, & microRNA screening; & proteomics. Research training will emphasize cell engineering, directed differentiation, functional assessments, & drug discovery. The program will offer comprehensive training in stem cell research & allied disciplines to allow trainees, upon completion, to translate basic discoveries to clinical, biotech, & pharmaceutical settings. Our Faculty are dedicated to excellence in research & strongly committed to train the next generation of stem cell scientists. Importantly, this program is one of the hubs in a robust synergistic network of training programs on the [network] that will leverage the combined & complementary strengths (efficiently & parsimoniously) of the collaborative powerhouse institutions on the [program].
Statement of Benefit to California (as written by the applicant)	California will benefit from the trainees (pre-doctoral, post-doctoral, & clinical) who graduate this unique, intensive, multi-disciplinary, collaborative, translational Training Program: 1. Patients will benefit from improved therapies. The training program will produce highly-skilled, rigorous stem cell & regenerative medicine scientists & clinicians, who will expand the pool of researchers in California working towards the development of novel therapies for a broad range of diseases (neurologic, cardiac, endocrine, myopathic, oncogenic, aging-related, etc.) 2. Technology transfer to California institutions. The training provided will inevitably enable trainees to make discoveries that can be translated to the clinic and/or to the biotech & pharmaceutical settings, resulting in licensing fees & royalties that will return to the State as well as lowering the costs of health care. In addition, the competitiveness of California's technology sector will be increased with the potential for creating new jobs. 3. Enhanced ability of California institutions to recruit "marquee" scientists & trainees, as well as companies. Moreover, because of the translational nature of the research & the resulting technology transfer to industry partners, the increased number of highly trained scientists should have a similar impact on our biotechnology and/or pharmaceutical companies.
Funds Requested	$4,915,671
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation of the GWG."

	Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 90

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	90
Median	90
Standard Deviation	1
Highest	92
Lowest	90
Count	15
(85-100): Exceptional merit and warrants funding, if funds are available	15
(1-84): Not recommended for funding	0

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 14	• The training will have a huge impact on the trainee's careers and will position them towards their next career stage. • Major strengths include mandatory course work, bench to bedside tutorials, monthly 'Grand Rounds' merging clinical with pathology/pathophysiology of disease, comprehensive outreach plans targeting under represented minority people. Weaknesses: none • Strength of 3 collaborative institutions w/ expertise in basic & clinical stem cell-focused research. • Excellent program with outstanding bench to bedside. • Extensive coursework is in place including a Stem Cell and Ethics Core course. Course will have lectures by faculty from multiple institutes that will be participating in the program. • Excellent plans are in place to recruit trainees that represent the broad diversity of California for the Ph.D. portion of the program. • Interesting concept on mentoring the junior mentors but helpful to have more details- how will this be done?
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 14	• Plan aims to train a total of 18 predoctoral, 6 postdoctoral and 2 clinical trainees. Major strengths: outstanding course work plan, qualifications of instructors and healthcare engagement. Mentoring is well described for predoctoral students. Other strengths include their plan detailing how they will select students, and its commitment to DEI. • Outstanding course program including bench to bedside tutorials for translational research. • Outstanding infrastructure in place as well as opportunities to perform stem cell/gene therapy research and regenerative medicine. • Well thought-out mentoring program. • Excellent plans are in place to recruit trainees that represent the broad diversity of California for the Ph.D. portion of the program. • Strong DEI program. • More detail could have been added to mentoring clinical and postdoctoral trainees.
No: 0	*none*

GWG Votes	Is the program proposal practical and achievable?
Yes: 14	• Strengths: leadership team and [regional] Stem Cell Educational Network appears to be an outstanding training ground. • Feasible as demonstrated by the incredible track record. • Outstanding infrastructure in place as well as opportunities to perform stem cell/gene therapy research and regenerative medicine. • No clinical fellow training track record. This is offset, somewhat, by the experience of the leadership team.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 14	• Great track record with trainees. • Institute has a track record from previous grants (CIRM and others) of successfully training students (both postdoc and grad students). • Impressive track record however one thing that is of concern is the observation that 6 PhDs received PhDs with no publications- how is this possible? • Two previous CIRM training programs included outcomes that followed trainees two years out from graduation. Assumption is that same will be done with the current cohorts, but details appeared to be lacking in this area.
No: 0	*none*

Application #	EDUC4-12756
Title (as written by the applicant)	Training Program Bridging Stem Cell Research with Clinical Applications in Regenerative Medicine
Public Abstract (as written by the applicant)	This is a proposal to train the next generation of stem cell researchers at the predoctoral, postdoctoral, and clinical levels. A major emphasis of the training program is to bridge cutting-edge research in stem cell biology with its clinical potential in regenerative medicine. The host institution is uniquely qualified to offer this training program as it has undergone dramatic growth in stem cell research in the last decade. The institution has launched a new Department of Stem Cell Biology and Regenerative Medicine, opened a dedicated stem cell building financed by private donations and a CIRM Major Facilities Award, and created dedicated PhD and master's programs in stem cells and regenerative medicine. Key features of this program are an intensive course in stem cell biology and regenerative medicine, a course in ethics and regulatory guidelines, a discussion course led by practicing clinicians, and a hands-on workshop in cell and gene therapy manufacturing. The program includes an overnight retreat involving diverse stem cell researchers across multiple schools, career and professional development workshops, and numerous opportunities for interactions with patient advocates and the local community. A unique aspect is the direct involvement of clinicians in all aspects of the training program. Each trainee is required to have a clinical co-mentor, who will guide them in understanding the clinical potential of their research. The program has 60 training faculty in fields ranging from basic stem cell research to bioengineering, computational biology, immunology, and clinical research, providing trainees with a wide range of choices of mentors. The proposed program will train 3 predoctoral, 5 postdoctoral, and 3 clinical fellows, with private donations bringing the number of clinical fellows to 6 per year. This investment in training clinical fellows reflects the goal of the training program to bridge stem cell research with its clinical potential. Trainees will be supported for 2–3 years, and will be expected to perform rigorous research, complete both didactic and hands-on coursework, attend and present their work at weekly stem cell research presentations and an annual retreat, regularly engage with clinicians and patient advocates, and mentor local high school students and undergrads, many of whom come from groups underrepresented in STEM fields. The host institution has a long track record of successful training, including two previous CIRM Training Programs that produced researchers who are now professors at top research universities, as well as leaders in stem cell-focused biotech companies in California. The formalized mentoring and career guidance available will ensure that the program continues to produce the world-class researchers who will bring future cell and gene therapies to patients suffering from currently incurable diseases.
Statement of Benefit to California (as written by the applicant)	Millions of Californians suffer from incurable diseases, ranging from arthritis to debilitating neurodegenerative diseases. The promise of stem cell research to identify cures for many of these diseases has never been greater, but significant progress requires an influx of new, talented researchers and clinicians. This program is focused on rigorous training of the next generation of stem cell researchers and clinician-scientists, who will develop and implement the cures of the future. These trainees will become the research faculty who push stem cell research forward at major California universities, as well as the entrepreneurs who start new companies to produce cell and gene therapies for patients. These trainees will continue the enormous growth of stem cell science and regenerative medicine in California, generating billions of dollars of tax revenue and bettering the lives of patients looking for new types of treatments for debilitating disease. The track record of the host institution in trainee development, as well as its well-developed research and academic programs, make it highly qualified to run the proposed training program. The novel focus of the training program in bringing basic researchers and clinicians together reflects the mission of this next phase of CIRM to translate cutting-edge stem cell research into patient therapies.
Funds Requested	$5,000,000
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation of the GWG." Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 90

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	90
Median	90
Standard Deviation	2
Highest	95
Lowest	85
Count	14
(85-100): Exceptional merit and warrants funding, if funds are available	14
(1-84): Not recommended for funding	0

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 14	• The combination of coursework, research, patient engagement and community outreach provides a strong background for a career in stem cell research. • The project provides trainee participants with a strong scientific course curriculum, professional development activities, cutting edge stem cell research, and the opportunity for patient engagement and outreach. • Program focus on the relationship between stem cells and diseases should produce a commitment to the CIRM goals. Students will be exposed to the range of activities from basic research, product development, biomanufacturing and patient treatment. • The evolution of the program from a more basic stem cell biology training program to focus on translation is appropriate for the goal of accelerating treatments. • Inclusion of clinical participants and biomanufacturing content addresses key roadblocks in the translational pathway. • Program includes strong connection between basic and clinical research, so trainees will have (at a minimum) a good understanding of clinical issues and implications of stem cell/regenerative medicine research. • Increased efforts to recruit graduate students in under-represented groups. Data on diversity of applicants or trainees already in existing stem cells program. No clear efforts to diversify postdoctoral and clinical trainees. • The proposal has all the necessary and well-developed components for an EDUC4 program. • The patient engagement and outreach activities are well-aligned with program goals, but an explicit requirement to participate in these is not indicated. • Mentoring opportunities and training are not clear.
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 14	• Coursework utilizes existing courses in stem cell biology and regenerative medicine program. Appears that these courses are already being taken by the students, so no additional coursework required for trainees in the program. • Coursework involves a course in principles of developmental and stem cell biology and clinical perspectives of regenerative medicine; bringing stems cells to the clinical and training course in cell and gene therapy biomanufacturing. Unique aspects are the clinical perspectives course and biomanufacturing course. Biomanufacturing workshop will provide trainees with important information about issues to be addressed in realizing stem cell therapies. • A new workshop on stem cell biomanufacturing (hands-on) is a unique and innovative concept in training students.

	• The GMP approach is important. • The institution has strong and broad laboratory research in stem cells. Highlighted areas of strength include neuroscience, skeletal biology, kidney, cancer stem cells, and treatment and understanding of infectious diseases. • There are strong interactions between basic sciences and clinical translation in the medical school. • Inclusion of postdocs and clinical trainees in the courses helps unify the experience and build a community. • Patient engagement includes interactions with patient groups related to research strengths at the institution. • Clinical shadowing and clinical co-mentors provide insight into patient-physician perspectives on disease and stem cell treatments. • Potentially impactful community outreach activities include outreach to women and disadvantaged youths, hosting BRIDGES and high school students, and social media interactions with the public. These activities seem well-designed and build on existing relationships. • Mentoring plans for the predoctoral, postdoctoral, and clinical trainees are detailed and appropriate. Career-stage specific professional development activities are in place. • Mentoring committees with multiple mentors required for all trainees, and every committee must include a clinician and a scientist. • Clinical co-mentoring is a good way for trainees to understand the impact of their research. • There are opportunities for trainees to mentor high school students. • The diversity plan leverage a wide variety of opportunities for recruitment and retention at the institution. • Partnerships with other California universities and outreach programs provide a potential diversity pipeline. • All necessary components with the possible exception of an absence of an external review committee are of high quality. • Patient and patient advocate engagement involves efforts to educate patients about stem cells rather than trying to learn from patients about their conditions and then discussing how stem cells might help. • The idea to leverage alumni for networking and mentorship has potential, but a clear plan to do this isn't in place. • Explicit expectations of CIRM trainees to participate in the various activities are not clear. • Outreach component offers activities, but unclear how trainees will engage or the expected outcome of that engagement. • While the DEI plan is strong, the diversity of the prior training program was low. There is a clear opportunity to improve diversity moving forward if the commitment is present.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 14	• Well-considered program that has experience with training programs. • Resources at the institution are excellent. The program builds upon prior CIRM and NIH training grants in stem cell biology. • The breadth and depth of stem cell research and translation at the institution can clearly support a program of this size. • Matching funds for clinical trainees expand the reach of the program. • The applicant has matching funds to support 3 additional clinical fellows. Dean's letter recounts prior support to establish and grow stem cell research at the institution. Additional commitments to raise CIRM stipends to CA minimums, travel awards to trainees, support to increase diversity of trainees. • Letter of support from patient advocate groups, relative of a former patient, and programs with which they will do outreach. • The program director developed a graduate stem cell program in 2014 and directs a T32 program, so is very well qualified to lead this training program. Students and postdocs in their lab have received F31 and K99 awards. The program director has a record of successful mentoring and received a mentoring award from the institution. • The program director is very qualified. They have a strong mentoring record in their lab and established the PhD program in Development, Stem Cells, and Regenerative Medicine. The program director will oversee predoctoral training activities. • The associate director has an excellent research record in stem cell biology. The associate director has mentored a number of postdoctoral fellows.

	• An MD/PhD will oversee clinical trainees. This person has a track record of translational research and mentoring clinical trainees. • The associate directors will oversee postdoctoral and clinical training activities, respectively. They both have strong research and training records. • A significant number of recruitment mechanisms are in place, most notably relationships with CSUs and BRIDGES programs. • The overall recruitment plan is detailed and well-designed. • Strong program, leadership, and track record. • A concern is that program did not recruit URM even when the URM applicant pool had 25% or more URM applicants; it would benefit by reviewing its selection process with a lens toward inclusion. • The program lacks an external advisory committee.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 14	• The program has evolved significantly since the prior award. Major changes include a formal set of course requirements. These courses appear to be for all stem cell trainees, not just those supported by the CIRM award. Other changes include a stem cell seminar series, retreat, career development workshops and a greater translational focus. The program now has 26 faculty in the Department of Stem Cell Biology and Regenerative Medicine and over 100 throughout the institution. • The program tracked all 75 prior CIRM awardees. All are active in research in academia or industry. Those in industry are working in the stem cell area. Those remaining in academia have received some research funding. • The data provided demonstrate that prior training program participants have entered program relevant careers in both industry and academia. • Anecdotal evidence demonstrates placement of trainees in top research universities and stem cell companies. • Many successful students graduating from the program with excellent diversity. • Female representation of trainees on prior CIRM award and T32 is about 50%. About 10% URM on prior CIRM award, which is similar to their T32 award. • Outstanding, expanding to minorities is important.
No: 0	*none*

Application #	EDUC4-12792
Title (as written by the applicant)	CIRM Cell and Gene Therapy Training Program 2.0
Public Abstract (as written by the applicant)	The proposed CIRM Scholars training program is centered within an infrastructure that includes: (1) experienced well-funded mentors; (2) techniques, methodologies, and facilities essential for basic, translational, and clinical training in stem cell/regenerative medicine and gene therapy research; (3) established graduate training programs that provide the spectrum of experiences in predoctoral and postdoctoral training, MD and PhD postgraduate career development, entrepreneurship, responsible conduct of research, rigor and reproducibility, and bioethics; (4) a clinical enterprise that includes a medical school, teaching hospital, community clinics, workforce development programs, training opportunities with core competencies, and a Mentoring Academy; (5) exceptional regenerative medicine infrastructure initiated through prior CIRM funding; (6) core facilities that provide essential expertise in cell and molecular biology, preclinical models, genomics, and informatics/data science, to name a few; (7) a strong, collaborative framework in which to mentor and cultivate scholars with a multidisciplinary team approach, with special emphasis on the recruitment and retention of diverse (underrepresented, disadvantaged) trainees; and (8) community outreach, healthcare engagement, and public education. A strong supportive culture of training and career development is in place which enables expanding the pool and strengthening the pathways of the next generation of diverse scholars who embrace high impact research, team science, and effective community engagement. Core courses for all scholars are coupled with elective didactic courses provided from the extensive course offerings that are tailored to individual scholars needs based on the area of study and as advised by the mentoring team and training program leadership. The program is committed to training investigators in community-engaged research principles and strategies, including communicating science to lay audiences and embracing the role of communities in developing and implementing research programs. The overarching goal is to effectively connect basic and translational investigations with clinical trials and facilitate the identification of new regenerative and gene therapies for patients in need across all age groups.
Statement of Benefit to California (as written by the applicant)	The CIRM Scholar Research Training Program will provide significant benefit to the State of California and its citizens in the following ways: • Train diverse scholars to be the next generation of regenerative medicine leaders, advancing basic, translational, and clinical research and serving as mentors for future generations of scholars. • Develop diverse team-oriented investigators who will facilitate research and engage community partners implementing new cell and gene therapies for a range of human diseases and across all age groups. • Work with community partners to address health disparities. • Effectively communicate the science behind new therapies as well as the ethical, legal, and social implications of regenerative medicine and gene therapy research. Well-trained personnel are needed to eliminate critical bottlenecks in bringing cell and gene therapies to the clinic and to ensure these new therapies will be made available to all patients in need. Training scientists and clinicians committed to the field that remain in the state of California will relieve the statewide shortage. The program will also benefit trainees by providing new workforce opportunities. Over the 10 years of prior funding, our CIRM Training Program included ~60 graduate students, postdoctoral fellows, and clinical fellows that participated in a broad range of stem cell/regenerative medicine research projects. These projects resulted in ~200 publications in peer-reviewed journals. Current positions of former trainees indicate that the majority are in academic or industry positions primarily in California, with others working in healthcare settings, supporting the long-term benefits to California and its citizens. With our recruitment efforts centered on trainees from historically underrepresented groups, and the addition of equity-centered inclusive training practices, the program aims to further increase the diversity of California's cell and gene therapy expertise thus providing future leaders. The new cohorts of scholars proposed will also be focused on reducing healthcare disparities in California thus providing benefit to a wide range of patients and communities.
Funds Requested	$4,966,300
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation of the GWG."

	Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 90

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	90
Median	90
Standard Deviation	2
Highest	95
Lowest	88
Count	14
(85-100): Exceptional merit and warrants funding, if funds are available	14
(1-84): Not recommended for funding	0

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 14	• This is a top-notch program that has an outstanding track record, and clearly is going to have a deeply positive impact on the career development of all of the members of the program. • Excellent proposal for training clinicians, postdoctoral, and predoctoral trainees. Exceptional community outreach plans in the community clinics, in particular, the student-run clinics serving diverse communities. • It appears that almost any area that a trainee wishes to pursue will be met with the opportunity to work with exceptional stem cell and regenerative medicine faculty. • The institution's stem cell programs have a long and successful track record. Outstanding faculty, trainees, and facilities. • From the stem cell biology perspective, a strength of the program is inclusion of diverse animal model systems, and the people who are drawn to caring for, working with, and improving the health of mammalian species that indirectly improves human health. • Likely to have broadest range of stem cell training, from agriculture to humans. • CIRM training will leverage resources in education tools, facilitates clinical trials, and improved research processes provided by the institution. • Study of human pluripotent stem cells through a generous $20 million Major Facilities grant from CIRM. • A centralized biomedical research center will provide services including assessment. • The academic health campus provides rich opportunities to engage diverse populations including underserved minority, racial, ethnic, rural, and those from low socioeconomic communities. • The institution serves diverse rural and urban populations, including operating student run clinics in the inner-city neighborhoods nearby and providing free healthcare to uninsured, low income, and other underserved populations.
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 14	• Excellent proposal covering all necessary aspects. Complete course offerings.

	• The program is exceptionally well-designed to provide a tremendous experience. There are a wide range of research opportunities with extremely successful scientists and a tremendous commitment on this campus to stem cell medicine. • The course requirements include basics of stem and progenitor cells, ethical legal and social implications of stem cell research, cell culture laboratory, literature course, summer course in manufacturing practices and a wide range of other opportunities. • This campus has a strong dedication to developing research teams to improve human health. • Outreach Program board has met bi-monthly for 15 years. Excellent community outreach programs. • Many competent mentors, additional access to institutional mentor training, which provides a competency-based mentor training program and aims and supports the essential role of superior mentoring in research. • There is also a specific "mentoring at critical transitions program" to enhance the preparedness of faculty in areas affecting mentoring, academic socialization, and overall success. • There is a strong mentoring program involving individual training mentors and mentoring teams, including assessment by an internal advisory committee to consider the trainees next year support. There are multiple mechanisms for formal assessment. • Well considered mentoring plans. • External program evaluation is a strong positive for this program - it will provide an independent, less biased view than internal evaluation. • Excellent track record of past achievements using CIRM funding. • The record of training speaks to the ability to develop highly successful scientists and to keep track of their success. The training research program resulted in about 200 publications in peer-reviewed journals, with 90 manuscripts with the trainee as first author. 22 grants were funded with a trainee as PI and eight as co-PI. Trainees are employed in academic positions, and healthcare settings, and industry positions and even a leadership position at the NIH. • Has a particularly interesting outreach of trainee-run clinics in under-served communities. • Commitment to DEI is very strong at this campus. The school of medicine was ranked in the top five for diversity among its student body by U.S. News & World Report, and the current medical school class is highly diversified. • High degree of diversity. • Many opportunities for patient/community engagement (Student run clinics are highlight!); however, trainee requirements/expectations are not clear. • Strong overall, with expected components. Curriculum has many required courses, which would not be appropriate for all graduate students. Unclear whether it is sufficiently flexible.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 14	• Complete proposal with outstanding programs in all components: Extensive faculty participation, excellent facilities and outstanding animal models, excellent industry collaborations. • All the resources needed are in place, including a very strong commitment from the institution and extremely strong track record and funding. • The team is absolutely outstanding, as demonstrated by the other research accomplishments and by their success in previous iterations of this program. • The institutional commitment and the track record have been consistently outstanding. • There are partnerships across many communities to increase representation within the program. • Excellent diversity partnerships. Outstanding leadership and institutional commitment. Recruitment and training program is diverse, integrated, fully functional for predoctoral, postdoctoral, and clinical trainees. • Everything needed to support success is in place. • Holistic admission of grad students is an important strength; should do same for postdocs. • Strong institutional efforts toward DEI (34% of med students are Hispanic/Latina/o); They are determining what it means to be a Hispanic serving institution R1! However, it is not clear how institutional efforts intersect with program. • Hard to tell, but the coursework may be overwhelming and interfere with research and development.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes:	• Outstanding publication and funding record with excellent career development of past trainees.

14	• Training for GMP practices is key - the Director has extensive expertise there and truly basket of training pearls not available elsewhere for the trainees. • Yes, Over the 10 years of CIRM support, the prior training program included 24 graduate students, 25 postdoctoral fellows, and 10 clinical fellows that participated in a broad range of research projects. • Results here has been outstanding, as considered earlier. • Track record has been outstanding.
No: 0	*none*

Application #	EDUC4-12790
Title (as written by the applicant)	Training the Next Generation of Biologists and Engineers for Regenerative Medicine
Public Abstract (as written by the applicant)	This interdisciplinary training program: "Training the Next Generation of Biologists and Engineers for Regenerative Medicine" will provide academic and research opportunities in the basic biology of stem cells, bioengineering, genome engineering and gene therapy for a total of a total of 28 CIRM Scholars, including 4 predoctoral, 22 postdoctoral and 2 clinical fellows, over the five year funding period. A particular strength of the program is in bringing together trainees from engineering and basic biology laboratories in collaborative projects to create new devices and improve cell culturing technology, understand the biological basis of stem cell differentiation, aging and disease, and develop curative gene therapies. Trainees of this program will benefit from the outstanding graduate programs, research faculty, laboratories, core facilities and student/postdoc career and diversity support resources available at our institution. Application and recruitment processes are designed to ensure an exceptional and diverse group of trainees. Program coursework will include current topics in basic and translational stem cell biology and regenerative medicine, mentored practice in research presentation, career development, entrepreneurship, and ethical, legal and social aspects of pluripotent stem cell and genome editing technologies. All CIRM Scholars will engage in community outreach, interaction with patient advocates and diversity enhancement activities as a core element of their training. At the conclusion of their training, program alumni will be well prepared to become leaders in applying 21st century technology to furthering basic discovery, engineering innovation, and cures for currently unmet medical needs.
Statement of Benefit to California (as written by the applicant)	Education is the engine of California's innovation economy. The proposed program will benefit the people of California by helping to develop a brilliant and diverse group of young scientists into the next generation of leaders in regenerative medicine and biotechnology, who will communicate effectively with the general public, contribute to educational and healthcare equity for all Californians, and deeply appreciate the urgent need for cures.
Funds Requested	$4,954,238
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation of the GWG." Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 90

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	90
Median	90
Standard Deviation	2
Highest	93
Lowest	87
Count	13
(85-100): Exceptional merit and warrants funding, if funds are available	13
(1-84): Not recommended for funding	0

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the

application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 13	• Absolutely! Based on the success of many previous CIRM trainees from this institution, it seems very likely that this program will have a meaningful and positive impact on trainees of stem cell research. • This proposed program is combining resources from engineering and biology and creates a unique CIRM training program. • This program has several core faculty members who are leaders in stem cell research and gene therapy research. Many of them are already working on the delivery of stem cell-based and gene therapy treatments. • Based on a past history of successful CIRM trainees, it seems likely the program could have a significant impact on development of several aspects of regenerative medicine in California. • Yes, excellent mentors. • Strong overall program with stellar faculty mentors; good track record with previous award. • Stem cell center recognized that diversity is their core value. • This program will increase trainee diversity by recruiting more international diverse graduate students. And this program will utilize diversity officers from the institution departments to recruit more diverse students. However, all the strategies proposed here are not particularly novel and common to methods that many other universities used.
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 13	• This program is well planned. The trainees will be able to get research experiences both from biologists and stem cell engineers, which is very unique. The trainees will be able to understand why certain diseases require certain cells; as well as why large scale manufacturing of these cells could be difficult. • Yes, as evidenced by track record of success. • Strong institutional support for grad student & postdoc career development - many available opportunities. • Trainees of the proposed CIRM training program will benefit from training elements largely already in place, either as a continuation of activities of the original CIRM training program or developed for a more recent NIH predoctoral T32 program. • The trainees can do community outreach, such as visiting local high schools. • This program will provide a target-of-opportunity mechanism to recruit diverse trainees. • This program will collect trainees' feedback reports as the assessment of program effectiveness measurement. • This program will ask the faculty mentors to take two courses in order to provide unbiased mentoring. • Mentor training is a set of online courses with no discussion or application of the principles learned. • Trainees will have the opportunity to talk to mentors who have direct interactions with patients. However, this program did not describe detailed plans about how and how often the trainees can directly interact and engage with patients. • Weak patient engagement/outreach components (participation required, but not defined). • This program has documented previous trainees' progress. However, detailed plans for tracking trainee progress after completing the program are lacking. • This program could propose more coursework for CIRM trainees. So far, there is an ethics course in stem cell research; Fellows meeting about stem cell research. A course covering the history, and development of stem cell therapy is lacking. A course covering basic science behind stem cell research is lacking. • Focus on international students as major target for predoctoral positions is concerning and may decrease the proposal's potential to improve access across California's diverse population; it reads as support of international postdocs & grad students outside of faculty grants as a major driver of the proposal.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**

Yes: 13	• Yes! This program will train both biologists and bioengineers specialized in stem cell research. This institution is strong in both areas. • Great institution, great mentors, great track record. • The university will strongly support this training program and track record also supports that this training program will be successful in the future. • The resources available at this institution are more than adequate to support the proposed program. • The Program Director is qualified to manage this program. • Co-director is also the director of an NIH training grant, who might be too busy for this CIRM training grant. • International students with diverse background could be supported by CIRM program, but not the NIH training program since it asks for citizenship. This CIRM training program will support these students. • Yes, but recruitment for diverse candidates is very passive- no active outreach is present- only passive feed of prospective candidates from mentors.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 13	• The past training program has trained many successful stem cell professors who are actively working in the field. Yes, track record demonstrated success. • The outcomes of two previous CIRM training programs has been exceptional. The outcome of the NIH T32 program has also been very good, but more limited. Overall the prior training history speaks well for the potential success of the proposed program. • Excellent track record but diversity and outreach to communities could be improved.
No: 0	*none*

Application #	EDUC4-12772
Title (as written by the applicant)	Research Training Program in Stem Cell Biology and Regenerative Medicine
Public Abstract (as written by the applicant)	The goal of our Research Training Program in Stem Cell Biology and Regenerative Medicine is to train the next generation of leaders in stem cell, gene therapy, and regenerative medicine, who understand the need to accelerate delivery of new therapies to patients with urgent, unmet needs; how to move new research discoveries from the bench to the bedside and of the complexities of implementing novel stem cell trials; and the ethical concerns surrounding stem cell research. We propose a training program for two 3-year cohorts, each with three predoctoral and six postdoctoral CIRM Scholars. This program will leverage the strengths of our institution in stem cell biology, regenerative medicine, and in conduct of innovative clinical trials. Scholars will undertake a program of: (1) formal course work in fundamental biology of stem cells and regenerative medicine; translation of stem cell therapy into clinical practice; and ethical issues emerging from this research and its implementation; (2) mentored independent research; (3) participation in patient outreach and education activities; and (4) community outreach through integration in ongoing programs. The training program will also feature a Stem Cell Research Day focused on Scholar research and an annual Stem Cell Biology, Gene Therapy, and Regenerative Medicine Symposium. Thirty-two research faculty will participate as mentors across several programs bridging basic science and clinical practice in different areas of stem cell research, including: hematopoietic cell transplantation, transplantation of insulin-secreting beta cells, gene therapy for repair of dysfunctional cell populations, directed differentiation of stem cells for repair/regeneration of damaged tissues, and cell-based immunotherapies. Through these activities and in this rich scientific and clinical environment, the proposed program will stimulate innovative multidisciplinary research that has potential to treat diseases that are an economic burden to the health care system such as diabetes, blood disorders, including sickle cell disease and blood cancers, Alzheimer's disease and other neurological conditions, and many other disorders. Importantly, through the planned patient and community engagement and outreach activities we will promote in our Scholars an awareness of the inequities that impact implementation of therapies for all patients and will encourage Scholars to be active participants in better meeting the needs of patients in underrepresented and underserved communities. In addition, we will recruit Scholars who represent the diversity within the population of California. In conclusion, our training program will foster the early career development of outstanding scientists who are prepared to advance CIRM's mission of accelerating novel stem cell-based therapies to treat chronic and incurable diseases.
Statement of Benefit to California (as written by the applicant)	The fields of stem cell research, gene therapy, and regenerative medicine are rapidly expanding and promise to have a significant impact on the healthcare and the economy of states and countries. We share with CIRM the mission of accelerating stem cell therapies to meet the medical needs of the people of California. Our Institution is committed to being proactive in fostering an inclusive and safe environment that embraces diversity and diverse perspectives. Biomedical research flourishes when students, faculty, and staff are empowered to think big and to work inclusively. We are certain that diversity drives discovery and innovation. Our program is inspired by these ideals and leverages the strengths of our institution in stem cell biology and regenerative medicine, and its unique ability to develop and translate innovation into clinical trials, particularly into first-in-human studies. We are committed to training the next generation of leaders in the stem cell, gene therapy, and regenerative medicine fields, while enhancing their understanding of patients' needs and of the complexities of implementing novel stem cell trials. Our training program will benefit the citizens of California in many ways: -By stimulating innovative multidisciplinary research that has the potential to treat diseases that are a psychological and economic burden to the health care system of California, such as diabetes, sickle cell disease and other blood disorders, Alzheimer's disease and other neurological conditions, and many other disorders. -By fostering a generation of innovators who are aware of the inequities that impact implementation of therapies for all and who will be active participants in meeting the needs of patients in underserved communities. Of particular importance, focus will be placed on developing and adopting technologies that can significantly reduce costs, so that novel cell and gene therapies can be available to all patients who need them, while reducing the economic burden on the California's healthcare system.

	-By recruiting and training a diverse workforce representing Californians who are underrepresented in medicine, including individuals who are first to attend college or from socioeconomically disadvantaged or underrepresented communities. - By strengthening a workforce committed to accelerating the development and clinical testing of new stem cell and gene therapies and with the mission of educating the citizens of California about the benefits of stem cell research. In conclusion, our training program will train future leaders in how to develop innovative approaches for the treatment of incurable diseases, as well as the need for interventions that address health inequities in underrepresented and undeserved communities, ultimately having tremendous impact on the lives of individual patients and their diverse communities in California.
Funds Requested	$4,860,989
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation of the GWG." Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 88

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	88
Median	88
Standard Deviation	0
Highest	89
Lowest	88
Count	14
(85-100): Exceptional merit and warrants funding, if funds are available	14
(1-84): Not recommended for funding	0

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 14	• This is a well-balanced program that will provide trainees opportunities and training in stem cells/gene therapy. • Trainees will have extensive interactions with patients and the community. • Strong coursework and especially strong patient engagement. • There is a strong institutional focus on translation and delivery of therapeutics, with the Alpha Stem Cell Clinic and the institution's center for therapeutics. • Three CIRM specific courses including conceptional stem cell biology, translation (represents a new course and ethics (reworked) course. • To achieve greater coverage of previously less emphasized areas of coursework, they have expanded the curriculum to include the new course "Translating Stem Cell Therapies into Clinical Practice" • Good proportion of first generation university students in program.

	• Strong diversity program, good retention of URM in graduate program, need to improve proportion of URM in postdoctoral program but good attention to pipeline issue through summer student program and NCI R25 Yes to Success. • The predoctoral portion of the proposal relies on recruitment from the current Ph.D. class. While it is noted that 60% of this population is comprised of URMs, it is not clear how many of the total would qualify for slots on the current training grant. • Not clear how many trainees will pursue CIRM stem cell positions out of the large class. • Curious there is no proposal to train physician scientists in research.
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 14	• Strong coursework offerings in stem cell biology, translation, ethics law and societal impact, gene therapy, manufacturing and journal club/seminar series. • Solid curriculum, but a lot of courses – will postdocs take them? Is it too much for advanced grad students? • New course work and stem cell workshop. • Very strong patient engagement/outreach opportunities with requirements for trainees to devote 5% of their time. • Yes, outreach involves a nice collaboration with Department of Supportive Care Medicine. • The CIRM Scholars will receive exposure to stem cell core facilities like a state-licensed biologics manufacturing facility designed for the production of DNA, proteins, cell products, and viral vectors for clinical trials and the Alpha Stem Cell Clinics Network (CIRM #AC1-07659) was one of the first of the clinics to form the current and has supported more than 40 clinical trials, including 9 involving COH cellular products used in first-in-human trials, and more than 30. • Predoctoral trainees will be selected from the graduate school (89 total students). There is diversity represented in the students currently in the grad school. • Good institutional professional development for postdocs. • Excellent group of mentors (32) but strengths pretty much limited to applied research in hematology and oncology fields. These are important areas of stem cell research, but many programs offer broader experience. • Adequate program, supported by institutional training framework. Good program in professional development. • Scholars must develop an IDP, but no mentor training. • Not clear how many of the 89 current students would be candidates for the positions supported by the current proposal. • Maybe some question about the pool of available trainees. • Observation: more than 80% of current postdocs are international; it may be challenging to recruit domestic trainees. • Papers and grants to measure success may not be appropriate for people going into industry. • Tracking of trainee progress after program completion not articulated clearly. • No reasonable tracking mechanism, especially for alumni moving into industry. • No tracking plan for trainees.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 14	• Yes, excellent infrastructure for translational medicine, NIHT32 and K12 programs attest to capabilities of the institution in training. • The institution has track record in stem cell biology, gene therapy, and regenerative medicine programs. • Integrated with the graduate school in biological sciences. It offers a PhD in Biological Sciences, a PhD in Translational Medicine, an MS in Regulatory Affairs, and an MS in Translational Medicine. • Tradition of excellence in multi-disciplinary research programs that cross-fertilize with experimental medicine and clinical practice. • Nice presence with the clinic involvement for trainees. • Very strong mentor pool with strong IDP program for trainees at all levels. • CIRM scholars are required to dedicate 1 day/month to patient and healthcare engagement activities. • Excellent plans for trainees to interact with patients and the community. • One of the program leaders also has a leadership role in the institution's DEI efforts - can be a big advantage in broadening participation efforts.

	• Experienced leadership with excellent track record. • Depth and breadth limited to hematology and oncology- limited diversity topically.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 14	• Strong track record. • Strong placement of most graduates, good publication records, many appointments at the institution, also overseas. • All of the previous Scholars are pursuing biomedically-related careers either in biomedical research (46%), in managerial positions in biomedical industry firms (46%), or in science administration or education (8%). • 13 former CIRM Scholars published 46 full publications and 2 reports from work performed during their fellowships. • 13 (out of 14) scholars completed the program. • Very high percentage of URM and good record of completion and engagement in biomedical careers. • The plan appears to be to look at papers/grants to measure success, which will miss a large number of graduates of the program. • Long-term tracking is the responsibility of "program leadership", but no details are provided regarding how tracking will occur. • Poor tracking plan in place for students.
No: 0	*none*

Application #	EDUC4-12802
Title (as written by the applicant)	CIRM Training Program for Stem Cell and Regenerative Medicine Research
Public Abstract (as written by the applicant)	This CIRM Training Program will support 6 PhD Post-Doctoral and 3 MD Clinical Fellows every year to conduct research in stem cell and regenerative medicine. In the past 20 years, our interdisciplinary research program has gained an international reputation in stem cell and regenerative biology. To prepare the CIRM Scholars as researchers contributing to stem cells and regenerative medicine as future scientists, a two-year training plan has been developed with the following scientific curriculum. 1) A rigorous research project will be developed with an identified mentor who has expertise in-line with the Scholar's research interests. 2) Required courses will enhance the CIRM Scholar's knowledge in stem cells and regenerative medicine and implications in health and disease as well as ethical, legal, and social implications of stem cell research. A series of workshops will enhance the CIRM scholar's hands-on and practical experience. 3) Mentoring and career development will help the Scholars in obtaining future positions either in academic research, industry, clinical practice, or as physician scientist. A steering committee and external advisory board have been formed to help the Program Directors oversee different aspects of the training program. This CIRM training program is committed to educational activities, community outreach, and engagement of patients and health care professionals. We will ensure the diversity, equity and inclusion of our program. This CIRM Training Program will further expand our efforts and excellence in stem cell research for training future scientists, researchers, and physician scientist in California.
Statement of Benefit to California (as written by the applicant)	This CIRM Training Program will support 6 PhD Post-Doctoral and 3 MD Clinical Fellows every year to conduct research in stem cell and regenerative medicine. In the past 15 years, interdisciplinary research in stem cell and regenerative medicine has made significant impact on California's workforce. A unique focus of this training program is to advance stem cell and regenerative medicine to treat childhood diseases, which will also lead to better outcomes for many disorders that occur later in life. To continue to prepare the CIRM Scholars as the next generation researchers contributing to stem cells and regenerative medicine as future scientists, a two-year training plan has been developed with the following scientific curriculum. 1) A rigorous research project will be developed with an identified mentor who has expertise in-line with the Scholar's research interests. 2) Required courses will enhance the CIRM Scholar's knowledge in stem cells and regenerative medicine and implications in health and disease as well as ethical, legal, and social implications of stem cell research. A series of workshops will enhance the CIRM scholar's hands-on and practical experience. 3) Mentoring and career development will help the Scholars in obtaining future positions either in academic research, industry, clinical practice, or as physician scientist. A steering committee and external advisory board have been formed to help the Program Directors oversee different aspects of the training program. This CIRM training program is committed to educational activities, community outreach, and engagement of patients and health care professionals. This training program will provide unique benefits to the State of California and its citizens by providing a superbly trained group of stem cell experts. The trainees in this program will also strengthen and accelerate our research efforts in the stem cell and regenerative medicine field in hope to generate new treatments for many diseases for patients in California.
Funds Requested	$4,999,500
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation of the GWG." Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 88

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	88
Median	88
Standard Deviation	1
Highest	90
Lowest	85
Count	14
(85-100): Exceptional merit and warrants funding, if funds are available	14
(1-84): Not recommended for funding	0

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 14	• Excellent environment for basic science, translational stem cell research, and gene therapy. • The proposal addresses the RFA criteria of providing a research experience in stem cells and regenerative medicine, course work to enhance knowledge in stem cells and regeneration, professional development training, mentoring, and patient and public outreach. • The setting of the program at the institution offers unique opportunities to bridge basic research and stem cell treatments. • The institution has strong and broad stem cell research programs with the potential to address a variety of diseases and disorders. The proposal specifically notes expertise in intestinal organoids, stem cell-derived EVs for kidney regeneration, heart tissue chips and regeneration, retinal and neural organoids, MSC biology, and tool development to enable stem cell research and translation. • Good point of entry for MDs interested in research. Training of future physicians in stem cell science and regenerative medicine is essential for the field to progress and is high priority. • Combination of research institute with a world class pediatric hospital on one site with close links is a plus. Focus on pediatric disorders which provide unique opportunities for stem cell therapies will also provide a special training experience. • Focus on child development is unique and urgently needed. • Strong positive focus on pediatric disorders in a clinical setting. • Unique focus on children's diseases. • The institution has a diverse catchment area. • The strength in basic biology and disease modeling are evident. Links to translation are less evident.
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 13	• Yes, excellent offerings across a diverse range of fields-developmental biology, tissue engineering stem and progenitor cells in disease, regenerative biology. • Regenerative medicine in kids is a unique opportunity. Well organized courses. • The program is designed to provide trainee interactions with clinicians and patients to increase awareness of stem cell treatments and patient needs. • The program evolution involves increasing the breadth of research opportunities, better tracking of student progress, providing more choices in the curriculum, improving diversity in the trainee pool, and providing increased opportunity for patient interactions. These are all positives. • Good overall structure - strong curriculum, leadership, and research/clinical context. • Excellent coursework, partnerships greatly enhance the program, and the course in development and origins of disease is an interesting and innovative offering. Course in clinical perspectives provides strong background for translational research. Also excellent Tools and Technologies offerings, with leaders in their fields. • Overall the course plan is well-designed to efficiently provide technical and professional skills. • Good patient engagement, links to foundations, high school outreach.

	• CIRM trainees will be required to interact with patient/advocacy groups related to their research topic at least once per year. There are also opportunities to interact with patients and their families. • Strong patient engagement of all trainees: e.g, grand rounds required. • Community outreach beyond patient engagement consists of mentoring high school students from the area, focusing on Latino and African American students. This is a well-established program that will provide valuable mentoring experience to the CIRM scholars and benefits to the high school participants. • Mentoring committees are well designed and provides option for MD trainees to go on to PhD. Individual development plans in place. PhDs will provide co-mentorship for MD where required, which is a well considered approach. • Mentoring committees and IDPs required. • Diverse mentorship. • Strong training for physician scientists. • The core focus of the curriculum hasn't changed much in response to the rapidly growing field of stem cells as therapeutics. The focus on translation and therapies could be strengthened. The focus on pediatric treatments is mentioned, but specific activities related to this are not clearly described. • The proposal describes standard efforts to recruit diverse populations. Efforts to build diverse communities and retain the participants are not described.
No: 1	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 14	• Institutional commitment to training postdocs and clinical fellows in regenerative medicine is strong. There is clearly a sufficient pool of qualified trainees to support this program. • Inclusion of a DEI expert on the steering committee is a good step toward increasing diversity in the program. • Large, diverse recruitment pool. • Alumni engagement in mentoring is a strength. • Yes, infrastructure excellent, variety of potential mentors and partnerships. • The project administrative coordinator will keep in track of alumni. Engagement of alumni in the program after they move on to new opportunities is likely to help the tracking efforts. • The leadership team has complementary expertise in research, translation and education. The three PDs have strong mentoring records. Notably, one director directs the a Ph.D. program in Biomedical and Biological Sciences and a high school internship program. One director brings clinical and translational perspectives. • Yes, the program director is experienced in this area. • Good track record and one T32 training grant. • DEI officer and community outreach to address pipeline issues. • Proposal did not describe sufficient DEI efforts but the supplement clarified the outcomes and alleviated concerns. • Mentoring is fairly standard, consisting of a mentoring committee and IDPs that are reviewed every six months. • Contains typical training components - nothing stands out either positively or negatively. • Partnership with another institute might offset the limited pipeline. • Maybe- No pipeline, totally dependent on PIs recruiting students. • Relatively limited number of mentors. • Efforts to remove bias from admissions by blinding the applicant are creative. Implementation of this will likely be difficult though. There are concerns that this blinding might result in less diversity in the program.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 14	• The proposed training program builds upon a largely successful postdoctoral and clinical fellow training program at the institution. • Prior trainees of this program have been quite successful in their early stage careers in stem cells and regenerative medicine. Trainees have entered a mix of academic, industry, and clinical positions. Several trainees are at leading academic institutions and companies in the stem cell and regenerative medicine area. • 32 previous trainees published well ~15 papers per year over 10 years, generally excellent placements in academia industry or clinical posts.

	• Good retention in California. • Good record of academia and publications. • Good track record of previous students they could attract. • Strong track record. • Hold a T32. • The proposal indicates a commitment to diversity. In the past, the diversity of the program matches that of the institution's postdoctoral and clinical fellow pool in terms of URM, and was underrepresented in female participation. The applicants acknowledge that they need to improve the diversity of the trainee pool. • Notable publications arose from the trainees. The application stated that "many" trainees published paper, but one would expect ALL trainees to have publishable work.
No: 0	*none*

Application #	EDUC4-12759
Title (as written by the applicant)	CIRM Training Program in Systems Biology of Stem Cells
Public Abstract (as written by the applicant)	In 2020 the people of CA reaffirmed their commitment to stem cell research and therapy development by passing proposition 14 that funds basic and translational research and educational programs that promote training of students in stem cell fields. The objective of this program is to train basic, data, and social scientists and engineers to become the next generation of leaders whose approaches to translating stem cell discoveries into therapies are unconstrained by disciplinary boundaries. We have designed a program that will bring together scientists from a wide variety of academic and cultural backgrounds to participate in an inclusive and collaborative stem cell community. Our approach to integrate research, coursework and public service will be to build on each trainee's strengths and passion with a training program that provides the following. 1) Coursework: We have designed a curriculum that covers the fundamentals of stem cell biology, specialized features of stem cells, methodologies that allow the experimental and computational study of stem cells, and the ethical, legal and social implications of stem cell research. 2) Seminars: Trainees will attend conferences that feature leading stem cell scientists and allow opportunities for scientific exchange. They will also participate in local Stem Cell Science Club and regional Stem Cell meetings. 3) Trainees will engage in community outreach, educational ventures, and patient engagement activities. We will provide many opportunities for trainees to speak with community members, teach at high schools and support local patients and their families. 4) Career development: trainees will have access to the members of our internal and external oversight committees of prominent stem cell biologists, who will provide career advice; to our extensive contacts in industry, who will provide shadowing opportunities in regenerative medicine; and to our colleagues at the CA State Universities who will provide pedagogy training opportunities. 5) Mentoring: We implement a structured and purposeful mentoring program by faculty members who are trained in inclusive and equitable mentorship. 6) Research: Trainees will devote most of their time to stem cell laboratory research, supervised by our growing numbers of stem cell faculty who are leaders in cell, molecular and computational biology, biochemistry and bioengineering. Trainees will also have the opportunity to explore how science intersects ethics by engaging with our collaborators at the Science and Justice Research Center. This application builds and expands on our previous CIRM funded Training Program that generated impressive outcomes for our cohort of 17 graduate students and 25 postdoctoral fellows. Here, we continue our training by building a collaborative cohort of dedicated trainees who will serve as a catalyst for the interdisciplinary approaches required to bring stem cell research from the bench to the bedside of the diverse CA population.
Statement of Benefit to California (as written by the applicant)	The State of California has made a commitment to support stem cell research and training to advance discoveries that will lead to diagnostics, therapies, and cures for human injury and disease. This proposed training program will propel the State towards reaching this goal by training Ph.D. students and postdoctoral researchers into future leaders in the fields of basic and translational stem cell research. Basic (or discovery) research uncovers the molecular and cellular mechanisms that instruct stem cells to remain as stem cells or to differentiate into the myriad types of cells of the human body. Knowledge of how stem cells function at this level is critical to utilizing stem cells for medical breakthroughs. While in this program, trainees will not only be gaining an education, but also making important contributions to the stem cell research project they have mapped out with their mentor. Trainees will receive interdisciplinary training in stem cell research that draws on expertise in developmental biology, cancer, genomics, neurobiology, and bioengineering. Trainees will also receive career skill training and build professional networks through program liaisons with California-based biomedical companies, and research- and teaching-focused partner universities. Thus, many of these newly trained stem cell scientists are expected to stay in California to build their own careers in academia or industry. Retention of highly skilled stem cell researchers will benefit the California economy and patients for years to come. A first-hand awareness about the needs of California's patients will be gained by trainees engaging with patient advocates, by shadowing opportunities with Regenerative Medicine companies, by collaborations with translational and clinical teams, and by working side-by-side with trainees focused on the social justice aspects of stem cell research. Trainees will

	disseminate their research findings to the lay public through a variety of community-level outreach efforts, thereby establishing a cohort of capable stem cell ambassadors. All training and activities will take place in an environment where diversity, equity and inclusion are highly valued and reinforced by multiple mechanisms. Trainees will be recruited from a variety of academic and cultural backgrounds and urged to appreciate the complex societal, ethical and legal implications of stem cell discoveries and the importance of equitably distributing the therapeutic fruits of this research. Thus, stem cell research will be performed both by and for the diverse California population.
Funds Requested	$4,913,271
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation of the GWG." Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 86

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	86
Median	86
Standard Deviation	1
Highest	88
Lowest	85
Count	14
(85-100): Exceptional merit and warrants funding, if funds are available	14
(1-84): Not recommended for funding	0

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 14	• The proposal is to reinitiate a CIRM Training Program in the Systems Biology of Stem Cells, which was funded from 2005-2015. Considerable momentum in stem cell training at the institution was achieved through the previous program, including the launch of the institute which will be the home for the new program. • Based on their previous success, the program co-directors have secured three new training grants that emphasize DEI, and the proposed curriculum will nicely leverage activities/course/outreach opportunities that have been nurtured through these programs. • The combination of coursework, research, patient engagement and outreach will provide students with state-of-the-art techniques and a basic understanding needed to develop stem cell therapies. • Trainees will be exposed to multiple core disciplines beyond stem cell biology, including: bioengineering; biochemistry; molecular, cell & developmental biology; genomics; neurobiology. Program also includes significant exposure to bioethics and social science. • The program will clearly have impact on trainees; career preparation and career paths in stem cell/regenerative medicine. • Inclusion of trainees doing research on areas of science & justice.

	• There are potential synergies with other funded DEI efforts on the campus, including an NIH Institutional Research and Academic Career Development Award. • The absence of access to a large clinical center is a drawback even though the basic science investigators are doing stem cell work. The number of investigators may be a limiting constraint on the program. • Absence of a close relationship with a medical school and/or teaching hospital(s) represents a significant weakness for training.
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 14	• The proposed curriculum is very strong and includes stem cell research training with a faculty member (90%), and a co-mentor with complementary expertise, which is a great idea. • The cadre of potential supervisors is outstanding, ensuring that trainees will be exposed to cutting-edge stem cell research. • Three required courses: stem cell research, stem cell ethics, epigenomics provide exposure to basic biological aspects and analysis of cellular aspects of therapies. Focus on ethics will expose students to social aspects of stem cell research. Large number of optional courses, but unclear how many optional courses a student must take and how training differs from curriculum for students in other related stem cell programs. Research will provide specific applications related to a range of important stem cell issues. • Strong scientific foundation provided by the institute and academic departments across three divisions. Numerous strong mentors available. Especially for a small institution, there is notably deep expertise in multiple areas of "basic" stem cell biology. • Good selection of required coursework and elective courses. • Three strong core courses and numerous electives are available. Instructors appear very well-qualified. However, a core course in translation/medical application would fill a significant gap. • Solid curriculum with associated seminars, workshops. • There is an IDP requirement as part of mentoring. • There is a requirement for diversity and inclusion training for all trainees and participating faculty. • Strong, established opportunities for community and patient outreach with clear expectations of participation (one per year of each type). • Annual mentor training. • Engagement opportunities could be better focused to the specific area of the training program. • Innovative outreach to clinical stem cell related patients (in the absence of a medical program at the institution). • Difficult to deliver translational/clinical training with the lack of a medical school- could some synergy/collaboration occur with other centers/medical schools for this purpose? • Relatively little immediate focus on human medical conditions. This can still be an excellent first-hand internship experience, but the absence of medical school/hospital relationships will handicap trainees most interested in applications of stem cell/gene therapy research to meet patients' needs. • More emphasis should be placed on preclinical studies. Some may receive this as part of their research, but it does not appear to be a required part of the program. • Several patient engagement opportunities available, but are less focused on understanding patient needs. It is critical for trainees to understand the patient experience before initiating discussions of therapies. Want to impress the importance of research to develop new, more effective therapies with reduced side effects. Limited duration of patient engagement. A single event is not sufficient to provide trainees with the appropriate perspective of patients. • Limited detail about mentoring of students and faculty.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 14	• A major strength of this program is the mentoring opportunities – the institution has an outstanding stem cell research community and mentoring and career development for the CIRM trainees. The potential mentors are from 7 departments in 3 divisions – lots of interaction through the institute which hosts 31 collaborative labs from the seven departments. • Quarterly reports are a feature of formal postdoc-mentor training as well as annual trainee reports, which will include a written scientific progress report, presentation at research review day annually and '360' evaluation by mentors and trainees. • Significant number of resources for training in stem cell research.

	• The program director has a record of publication and student mentoring in stem cell research. The program director received two Gilliam Fellowships for Advanced Study and actively participates in mentoring workshops. Leads an NIH-funded IRACDA training grant to prepare postdocs for a career in teaching. Leadership team has worked together. • Program director and the leadership team appear very well-qualified, and have worked successfully in training CIRM Scholars and other comparable trainees for >15 years. • Excellent mentors. • The program is scaled to be readily achievable. • Growth in faculty will support achieving the goals of the program. • 8 researchers in pluripotent stem cell biology; 5 researchers in stem cell genomics; 5 researchers in hematopoietic stem cells; 2 in mammary stem cells, 2 in germ line stem cells and 5 in cancer stem cells. Unclear if sufficient number of trainees. • Building program to 14 "steady state" training slots may be overly ambitious. Not clear that enough potential mentors have sufficiently strong research programs and funding focused on stem/progenitor cell biology to justify this number of trainees. • Size of the program may be too large based on available mentors.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 14	• The proposed program builds on CIRM program that ran from 2005-2015. The momentum from the previous program has helped the group secure three new stem cell grants that emphasize DEI. • The prior program outcomes were nicely reported: 17 PhD students; 25 postdoctoral fellows – all postdoctoral fellows and all but one PhD still in science; 29% of postdoctoral fellows got tenure track faculty jobs, aligned with their desired career path - all CIRM postdoctoral fellow alumni remain in stem-cell related fields. • The applicants report that the success of the previous CIRM program contributed to NIH funding the stem cell focused IRACDA award (started in Jan 2021), which will train 3 new PDFs per year for 5 years. As part of this program, the team has developed career mentoring curriculum, which has strengthened stem cell training and career development infrastructure. • Prior trainees have careers in biomedical sciences. High percentage still have research careers. Those with faculty positions appear well-funded. A number of changes were instituted based on the experience with the last CIRM training program. • Previously funded 17 PhD students and 25 postdocs under a prior CIRM training award. High percentage continue to work in relevant fields with good career tracks. • Excellent track record. • Able to track trainees.
No: 0	*none*

Application #	EDUC4-12751
Title (as written by the applicant)	CIRM Training Program in Translational Regenerative Medicine
Public Abstract (as written by the applicant)	We propose a CIRM Scholars Training Program in stem cells and translational regenerative medicine for 4 PhD student, 8 postdoctoral (PhD) scientist and 8 clinical (MD) physician trainees. Training the next generation of scientists and clinicians is vital for the lasting success of stem cell research and the translation of lab discoveries into clinical therapies to repair and regenerate damaged and diseased tissues. The institution's Regenerative Medicine Institute (RMI) is a world-renowned center for stem cell research and an ideal training environment. The proposed CIRM Scholars Training Program combines the unique strengths of faculty, scientists and clinicians with expertise in key areas of stem cell and regenerative medicine research to facilitate bench-to-bedside advances. Our stem cell and clinical biomanufacturing facilities provide cutting-edge resources to enhance the training environment. The Program offers formal training in: 1) the use of stem cells in regenerative medicine, 2) innovative techniques to study stem cells and model human diseases in the lab, and steps necessary before stem cell products can be manufactured for clinical use and evaluated in clinical trials, and 3) ethical, legal and social implications of stem cell research and regenerative medicine. The training experience is further enriched by partnerships with clinicians through the Clinical Buddies Program, an annual RMI retreat to facilitate collaboration, and community outreach opportunities to educate and inform high school students, patients and other members of the broader community. Our proven track record of blending research excellence with experimental medicine and clinical practice demonstrates that we are uniquely positioned to offer such training.
Statement of Benefit to California (as written by the applicant)	This CIRM Scholar Training Program will benefit the state of California and its citizens by: 1) training scientists and clinicians, including those from underrepresented backgrounds, to perform stem cell research and develop novel regenerative medicine therapies, 2) preparing scientists and clinicians to be the next generation of leaders in the regenerative medicine field, 3) translating lab-based discoveries into therapeutic products that will benefit patients with a variety of diseases such as Alzheimer's Disease, Parkinson's Disease, ALS, cardiovascular disease, inflammatory bowel disease, organ dysfunction, osteoporosis and cancer, 4) providing outreach opportunities to educate high school students about stem cells and careers in regenerative medicine, and 5) sharing information about advances in regenerative medicine research and ethical and social issues related to stem cell research with patients and the general public to help them make healthcare decisions and more informed choices at the ballot box.
Funds Requested	$4,999,333
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation of the GWG." Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 86

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	86
Median	86
Standard Deviation	1
Highest	88
Lowest	85
Count	13
(85-100): Exceptional merit and warrants funding, if funds are available	13
(1-84): Not recommended for funding	0

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 13	• This proposed program is likely to have a positive impact on trainees' career and awareness of therapy development since this program is located in a hospital and provides four CIRM scholar program activities. • Based on past history, the program will have a very positive impact on the trainees career development. • The program is likely to provide training that will foster a commitment to regenerative medicine. • The supplemental information implies that the institution does a good job of recruiting a diverse group of trainees. • Many of the mentors are physician scientists. • Interesting clinical training with ward work/shadowing clinicians. • All trainees will interact with a clinician 4-6 hrs per month, so every trainee will have clinical experience. • Strong existing Stem Cell Research and Regenerative Medicine Program (26 faculty, 8 PhD students, 15 postdoctoral scientists, 12 senior scientists and over 50 research staff). • Program would co-exist with other institutional research programs that focus on a regenerative medicine. • Institution has a GMP facility, Innovation Center (established in 2019 with a $50M commitment to Proteomics and Genomics Core Facilities) • Contact time with patients might not be enough.
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 13	• Yes, this program is well planned. This program has coursework, and unique scientific curriculum, including the clinical buddies. PhD students and Postdoctoral Scientists will be paired with faculty who are active physician scientists at the hospital through the Clinical Buddies Program. They will spend 4-6 hours a month with their Clinical Buddy. Biomanufacturing Center is also unique. • This program provides extensive coursework covering translational aspects of stem cells. • The program is well-designed. A novel aspect of the program is the "Clinical Buddy"; an idea that interaction between scientists and clinicians is critical for effective translational research. All trainees will be paired with faculty who are active physician scientists at the hospital through the Clinical Buddies Program. They will spend 4-6 hours a month with their Clinical Buddy, to shadow patient appointments and discuss clinical programs and how clinicians and researchers can work together. • Based on existing program/training grant with excellent track record. • Good mentoring program, including requirements of Scholars to mentor more junior researchers; IDP plan • Specific training metrics are specified (number of publications, etc); however, the metrics are relevant mostly/only to trainees who remain in academic positions. • Inclusion of a diversity committee in the leadership structure. • Three CIRM specific courses including translational, manufacturing and ethics course. • Unique Clinical Buddy system - 4-6 hours a month to shadow patient appointments and/ or discuss the clinical programs and how clinicians and researchers can work together to benefit patient care. • Seminars and retreat are program wide but mandatory for CIRM scholars; includes a general writing program. • A specific career development section for trainees is missing. • Stem cell course covering the basic science of stem cell biology and history of stem cell research is lacking. • Some courses require more rigor in selection of course materials.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**

Yes: 13	• Yes, this program has access to all the necessary resources, including state-of-the-art equipment and strong core faculty mentors. • The program director, who is a stellar stem cell researcher, is qualified to manage this program. Co-director also contributed a lot to the course development in this program. • 51 faculty mentors, many are clinical scientists, some CIRM funded, focused on neuroscience. • Program asks for funding of 4 Predoctoral (PhD) students, 8 Postdoctoral Scientists (PhD or equivalent degree) and 8 Clinical Fellows (MD or MD/PhD) for 3 years of training. Trainees would be integrated into existing programs (35 Master's students and 51 PhD students are currently enrolled in graduate programs). There are now more than 130 postdocs (plus 40 visiting postdocs and 5 NIH T32 programs) with specifically designed CIRM activities. • The institution provides strong support to this program and allow the program trainees to use almost all the core facilities within this institution. • All of the necessary resources are available to the program. The institutional letter of support implies that the institution is committed to this program if funded and will provide space and resources for the program. • A diversity and inclusion framework has been developed by the Executive Diversity and Inclusion Council for the organization to lead efforts for the next three years. • The institution's record of supporting activities that reduce barriers in research for underrepresented communities continues to be inclusive of multiple dimensions of diversity.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 13	• Yes, many previous trainees became PIs and professors at leading institutions. • CIRM funded investigators, Bridges program funding from CIRM, and T32 training grant all combine to predict success. • Program Director held one of the first NIH T32 stem cell training programs at a different institution and has a strong track record in this area. • Lots of committees, including a diversity committee: "Our priority is to be proactive in this respect, and specifically target advertising for the Program to minorities." • The prior history of recruitment has been good, but may not be directly translatable to the currently proposed program.
No: 0	*none*

Application #	EDUC4-12837
Title (as written by the applicant)	Stem Cell Training Program
Public Abstract (as written by the applicant)	Setting aside the ethical implications of using certain embryonic versus adult stem cells, the scientific value of stem cell research is undeniable. The potential of stem cells turning into any cell has enormous promise for replacing the damaged cells in any organ system. Advances in the programming of stem cells to prevent, treat, and reverse previously untreatable conditions can have important public health implications. The renewed mandate from California voters provides a unique opening to realize and consolidate gains of stem cell research and regenerative medicine. With this momentous opportunity, exploiting our institution's rich technical and scientific resources, we seek support to advance three goals proposed in this application. The first is to create a stem cell-focused program that will enable to recruit and train researchers in stem cell biology and regenerative medicine, its translational significance, the underlying ethical considerations involved, "bench-to-bedside" translation, and commercialization strategies. The second is to educate the public, with a specific focus on the biology and ethics of stem cell research and keep the community updated on the technological advances in the field. The third focus is to retain the trained stem cell researchers by providing access to the latest emerging companies based locally. The proposed training program includes a didactic curriculum on Stem Cell Biology, Research Methods and Stem Cell Therapies", "Ethical, Legal, and Social Implications of Stem Cell Research and Therapies," "Omics Approaches to Regenerative Medicine," and "Technology transfer and Commercialization." Our robust community outreach programs will educate the public and enhance bench to bedside translation of Science. Providing accurate information and keeping the public updated on technological advances in the field are highly important for the conceptual acceptance of stem cell research, participation in clinical trials, and future tax-payer funding initiatives. The funding of this application will allow the trainees interested in stem cell biology and regenerative medicine 1) to leverage the existing scientific resources, access the emerging stem cell-focused local biomedical companies, and train under the mentorship of innovators and leaders in the field of stem cell research; 2) educate and engage the general community in clinical applications and ethics of stem cell research; and 3) increase highly trained scientists ready to pursue long-term career opportunities in regenerative medicine and stem cell research.
Statement of Benefit to California (as written by the applicant)	With the goals to recruit, train, retain, a California-based diverse stem cell workforce, and by educating the non-scientific general public on the clinical applications of stem cell research, including the ethical, legal, and social issues involved, this proposal advances the central mission of CIRM. Each of the three proposed goals addresses a specific facet of this proposal. The creation of a stem cell-focused program will accomplish the first goal, i.e., recruitment and high-quality training of researchers interested in stem cell biology and regenerative medicine utilizing the existing excellent technical, mentorship, and leadership resources. Although a graduate training program and multiple clinical fellowship programs are already in place on our campus, the establishment of a stem cell-focused training program will be the first on this campus, which is likely to not only infuse enthusiasm for stem cell research but is likely to inculcate life-long careers in the field. The proposed strategies to educate the public, specifically targeting the South Bay, on clinical applications and medical advances in stem cell biology and the ethical considerations involved allows achieving the second goal. This is highly relevant since the personal beliefs on stem cell research are highly variable, but many of these are based on incomplete and often inaccurate information. Providing accurate information and keeping the public updated on technological advances in the field are highly important for the conceptual acceptance of stem cell research, participation in clinical trials, and future tax-payer funding initiatives. This complements our already existing and highly effective community engagement and teaching programs in many areas, e.g., obesity control, smoking cessation, med-school for elementary school students, etc. The proposed strategy to capitalize on a host of local cutting-edge biotech companies involved in stem cell research to retain CIRM scholars achieves the third goal of this proposal. This will lead to an increase in a highly trained and diverse stem cell research-related workforce, benefitting both the CIRM scholars as well the State of California.
Funds Requested	$4,999,999
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation

	of the GWG." Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 85

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	86
Median	85
Standard Deviation	1
Highest	89
Lowest	85
Count	14
(85-100): Exceptional merit and warrants funding, if funds are available	14
(1-84): Not recommended for funding	0

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 14	• The institution has expertise in many areas of research from progenitor/stem cell function in development, pediatric and adult diseases, fetal stem cells, induced pluripotent stem cells (iPSCs), tissue engineering, and cancer stem cells. • The program has strong emphases on training and community outreach, identifying and treating unmet needs. Community Programs are strong. • The program addresses the RFA criteria of research experiences in stem cell biology, a coursework curriculum, professional development, and patient engagement/outreach. • Research at the institution includes basic stem cell biology with significant breadth in stem cell type and application, as well as translational research. Trainees will be exposed to many stem cell-based therapies and different stages of development. • Participants will receive training relevant to diverse career opportunities in academia, industry, and entrepreneurship. • Clinical focus of program is significant. All trainees (grad, post-doc, clinical fellows) will have similar training. • Good potential for trainees to work in newly forming stem cell related companies and how to bring discoveries into clinical use. • A course on technology transfer and commercialization will expose trainees to concepts of business development in regenerative medicine that will complement their technical training. • Trainees will have the opportunity to interact with patient groups, although the linkage of these patients to stem cell therapies is not clear. • This is a new program which is led by a clinician who has had a successful neonatal fellowship in collaboration with the former dean of graduate studies at a nearby institution which together provide an excellent balance. • The new Ph.D. program and clinical fellow program are fairly diverse. The stem cell training program would likely have similar diversity. • Award would help to strengthen a new graduate program that had 54% Hispanic/Latino students and a build a STEM cell research program expanding from the leadership team's research efforts. • DEI strong for trainees and administrative staff. • One concern is the graduate program is new and has limited track record of student success.

No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 13	• Extensive programs for trainees, including clinical fellows, postdocs, PhD students, high school students and community outreach programs. • Community outreach programs focus on translational research including stem cell research and regenerative medicine. • Very interesting courses proposed on Omics and Tech transfer and commercialization by the chief business officer in addition to the necessary ones. • Reasonable curriculum, outreach, patient engagement. • CIRM trainees will be required to develop an Individual development plan (IDP). • Mentor training and IDP required. • The Mentor Training Program is in place and trainee assessment plan appears to be effective. • Strong leadership structure. • Grad students will be engaged as a cohort, an approach that research has shown to be particularly helpful for retention of first generation, low socioeconomic status, and URM students. • Concern: institution-wide patient engagement and outreach activities listed, but not how they are connected to proposed program or trainees. • Novel program design to promote clinical knowledge, but outreach is not directly stem-cell related. • A plan for following up with the trainees to ensure their success post-training is missing. • Follow-up measures to ensure a successful transition of the mentees into their next phase of career would strengthen the application.
No: 1	• The institution's researchers have expertise in adult and pluripotent stem cells in a variety of tissue/organ systems. Both basic and translational research opportunities are available to trainees. • Participation of proposed mentors in a mentor training program is a strength. • A technology transfer and commercialization course is a strength of the program, illustrating translational paths for stem cell therapies through industry. • A summer fellows program to bring high school students into labs is notable. • The curriculum lacks organized activities to build non-technical professional skills. • There is not a clear expectation of trainee participation in patient engagement and outreach, or a clear mechanism to match trainees with appropriate activities. • Numerous patient engagement activities are ongoing at the institution, and CIRM trainees will be able to participate in these. Few of these activities are directly linked to stem cell therapies, however. Thus, integration between research and patient engagement is weak. • Likewise, the institution has numerous ongoing community outreach opportunities for the CIRM trainees. These are interesting and impactful, but largely unrelated to stem cell therapies. • The mentoring plan is fairly standard, consisting of a mentoring committee and IDP. • Trainee tracking is not discussed. This is a major concern. • The application provides a compelling commitment to DEI, but specific mechanisms of building and maintaining a diverse community are lacking.
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 14	• All the pieces needed for success are in place and the program is aligned to the institutional capacity. • The leadership is outstanding. • Graduate students select laboratories after research rotations. Summer research placement according to interest and lab availability. • Core facilities are excellent and include resources with neighboring programs. • The institution has strong infrastructure in stem cell biology and regenerative medicine. Numerous core facilities exist to support stem cell research and translation. • Affiliation with a nearby medical center and partnership with another institution provide access to additional resources. Trainees have access to courses and training at a nearby academic institution. • The program directors have complementary strengths in research and education. Notably, one has expertise in directing a Neonatal Fellowship Program while the other directs the Ph.D. program in translational research. They are well qualified to lead this effort. • Excellent (perhaps best of all applications) recruitment of diverse group of students. • Excellent committee on diversity to train students in the care of diverse patients. • Despite the clinical nature of the program, most of the mentors are basic science faculty.

	• The leadership plan lacks details of program administration, including composition of the steering committee. • There is a concern about having a small number of cohorts rather than admitting trainees each year. This strategy does not lend itself to long-term continuity in the program.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 13	• Extensive training programs and outreach. • The past publication record is solid. • Trainees present every 4 months – excellent training and assessment. • This is a new program but prior trainees at the institution have been successful. There is not a track record in regenerative medicine or stem cells, however. • Track record reflects a clinical training program; not clear to what extent these trainees were successfully able to transition to an academic career with active research programs. • Training program for mentors could strengthen the program. • Integrating trainees with the summer high school program as mentors could also be a training opportunity. • No serious prior training, and no well-described mechanism for tracking trainees and outcomes. • A clear proposal for tracking the career accomplishments of these CIRM trainees should be developed as quickly as possible.
No: 1	• In spite of the lack of a track record, I think this proposal may be the most important one that CIRM could fund in this cycle. Any program that can recruit graduate students who are engaged in stem cell research and are a majority of individuals from Hispanic/Latino communities should be supported. If the model they use is successful, it would be very important to share broadly and also get education and DEI researchers to study to understand what it is doing successfully. • No previous CIRM EDUC award; limited record of success in training postdocs; no grad students have yet graduated.

Application #	EDUC4-12752
Title (as written by the applicant)	TRANSCEND – Training Program to Advance Interdisciplinary Stem Cell Research, Education, and Workforce Diversity
Public Abstract (as written by the applicant)	Our institution is located in California's Inland Empire, which includes two of the largest counties in our state. The Inland Empire is one of the most highly diversified and medically underserved areas in California. There is a critical need to train a workforce of stem cell researchers to serve this area and accelerate the introduction of stem cell therapies to the citizens of California. Our objective is to increase the number and diversity of highly qualified PhD and postdoctoral level scientists trained in stem cell biology in the California workforce and to provide trainees with the communication skills they need to be successful. Training will be offered through TRANSCEND (Training Program to Advance Interdisciplinary Stem Cell Research, Education and Workforce Diversity), an interdisciplinary program with an emphasis on diversity, inclusion, and equality. Our mentors come from 14 graduate programs, have well-funded research projects, established records of working collaboratively, and have won awards for research and outstanding mentoring. TRANSCEND will: (1) Train 16 PhD students and 11 postdoctoral scientists; (2) Provide three core graduate level courses and two stem cell seminars. These courses include Stem Cell Biology and Medicine, Ethical, Social, and Legal Implications of Stem Cell Research, and Science to Policy a course that trains students to communicate with non-scientists and politicians and provides them with the tools needed to transfer their science into policy; (3) Offer an annual Stem Cell Symposium in conjunction with the [regional] Stem Cell Consortium; (4) Provide enrichment activities that include participating in community outreach, travel to scientific meetings each year, interaction with patients and patient advocate groups, and opportunities to interact with our Center for Health Disparities (e.g. by participating in seminars and Engagement Studios) and our School of Public Policy (e.g., by receiving additional training in transferring science to policy). Our mentors will provide research training dealing with stem cells and regenerative medicine in the areas of (1) Bioengineering, (2) Neuroscience and Neurodegenerative Disease, and (3) Prevention and Treatment of Birth Defects and Reproductive Failure. Training will be interdisciplinary with cross training in the life sciences, biomedical sciences, and engineering. A Hispanic Serving Institution, our institution has an excellent record of recruiting, retaining, and training disadvantaged students from areas with unmet medical needs. Training will be enhanced and broadened through our affiliations with nearby research institutions, and the [regional] Stem Cell Consortium campuses.
Statement of Benefit to California (as written by the applicant)	The institution is a research-intensive, federally designated Hispanic Serving Institution, which is uniquely positioned to fulfill CIRM's program goals of accelerating stem cell treatments to patients with unmet medical needs and to broaden the participation of individuals representing California's diverse population in regenerative medicine. We will meet these goals and contribute major benefits to California through TRANSCEND (Training Program to Advance Interdisciplinary Stem Cell Research, Education and Workforce Diversity). The institution has demonstrated success in educating the next generation of underrepresented minority (URM) scientists at both the undergraduate and graduate levels. We will build on these successes to train CIRM PhD and postdoctoral researchers who will contribute to the diversity of the California stem cell workforce and facilitate economic growth in the Inland Empire, a region without economic privilege. As a major education and research institution in the Inland Empire, our campus has been consistently ranked #1 in the nation for social mobility, which is a measure of the degree to which universities lift graduates into higher income brackets. TRANSCEND will integrate critical courses with multidisciplinary research projects to train next-generation graduate students and postdoctoral researchers in the areas of stem cell research and regenerative medicine. TRANSCEND trainees will achieve an integrated education in stem cell biology, engineering, bioethics, and science to policy, while developing communication skills and contributing to the creation of new knowledge in stem cell biology and regenerative medicine. Our program includes a broad range of research areas that span basic stem cell biology to translational medicine. With this education, our trainees will be well prepared to contribute to the California workforce, while at the same time augmenting its diversity. Discoveries made by TRANSCEND trainees will benefit Californians by leading to new therapeutics, diagnostics, and medical devices for managing diseases, trauma, and the quality of life. Most of our trainees will come from the Inland Empire, a disadvantaged region with great diversity and many families with unmet medical needs. Our program will benefit economic development and growth in California, especially in the Inland Empire. Our cohort of well-qualified stem cell scientists will be ready to fill positions in the Inland Empire thereby enhancing their social mobility, while

	simultaneously aiding economic development by motivating biotech industries to locate in the Inland Empire. Taken together, TRANSCEND trainees will benefit the citizens of California by contributing to the diversity of the stem cell workforce, making new discoveries that lead to improvements in stem cell therapies and regenerative medicine, and assisting with economic development in the Inland Empire region of California.
Funds Requested	$4,993,115
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation of the GWG." Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 85

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	86
Median	85
Standard Deviation	1
Highest	88
Lowest	84
Count	14
(85-100): Exceptional merit and warrants funding, if funds are available	13
(1-84): Not recommended for funding	1

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 14	• The proposal clearly addresses the key elements of the RFA in providing relevant coursework, patient engagement and community outreach, mentored laboratory research, and diversity and inclusion. • The coursework component is well designed with an existing stem cell biology course (required) and electives related to regenerative medicine. The inclusion of required ethics and policy courses is particularly strong. • A broad variety of patient engagement and community outreach events will allow trainees to tailor their experiences. • The opportunity to synergize patient interaction and community outreach with their particular research project is a good way to reinforce the commitment to accelerating stem cell therapies. • The program has the potential to initiate a robust stem cell research enterprise in the Inland Empire area, which is medically underserved. The program will train 27 new stem cell researchers. • Strong DEI, evidence of diversity. Serious potential for significant impact. • Region of CA that is not served as well as other regions of the state by the healthcare system. Little other opportunities for stem cell research in this region of the state. • The diversity associated with the training program is a real strength. The institution has a very diverse student body and provides significant training opportunities across a variety of scientific and engineering disciplines. • Affiliated partners in the [regional] Stem Cell Consortium represent a pipeline for students from diverse backgrounds.

	• Will coordinate with the CIRM Bridges programs at two other locations to draw students into the program. • Strong engagement with local community. • Strong involvement with diverse trainees. • The lack of a direct relationship with clinical partners or industry is a weakness. Exposure to these translational communities is important for trainees to understand the pathways by which research moves to patients, and explore job opportunities. • The lack of a formal, organized professional development course or seminar is a weakness. It is pretty standard for training programs to build career skills beyond communication. • Mentoring opportunities and training are not considered.
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 10	• Trainees will have research opportunities in 25 stem cell labs in 14 different science and engineering graduate programs. • The program has strength in bioengineering, neuroscience, and developmental toxicology. Each of these represents a promising application of stem cell therapies or develops technologies that may advance stem cell translation. • The coursework program is well-designed, largely consisting of existing courses that integrate into breadth training in technical aspects of stem cells, as well as ethics and policy. • The stem cell community at the institution has a history of engaging patients and communities affected by Huntington's Disease in particular. • The Center for Health Disparities will partner in identifying advocacy groups and opportunities for trainees to interact with patients. A significant number of options have already been identified. • The Stem Cell Center has a strong community outreach program to K-12 students and the general public. Trainees will easily integrate into these activities. • The overall diversity plan is excellent. The institution has a very diverse student body and well-developed recruiting and retention programs that will be leveraged by this program • The program is inherently interdisciplinary, including Scholars from natural sciences, agriculture, and engineering. It has a solid complement of courses and experiences, seminars, and symposia. • There is some concern about how well the program will build supportive communities among the trainees and mentors, given the breadth of the candidate pool across 14 departments. In addition, it is unclear how the graduate student and postdoctoral trainees will interact and build a community. However, that concern is true for most proposals. • There are numerous opportunities for assessment that are well considered, but the specifics of what will be assessed in each activity are lacking. Research progress is fairly clear but other aspects of professional development, including program-specific elements, are lacking in the assessment plan. • The lack of translational projects and partnerships represents a gap in bringing the trainee research projects to treat a human condition. • Although the proposal describes general institutional efforts to support DEI, it does not sufficiently describe a well constructed plan to ensure that the program itself successfully recruits and selects a broad diversity of candidates. • Strong educational component, but poor description of the mentoring program particularly for diverse students. Also no plan to track students and no plan to deal with under-performing students. • The mentoring plan is basic, relying on PI supervision. The lack of a broader career development plan is a weakness of the program. • The program would be improved by providing trainees and mentors with ongoing mentor and mentee training and support. • Alumni will be tracked, but details are lacking.
No: 4	• Mentorship details are limited and not well-defined. • No plans in place to help mentors learn how to mentor. • Mentoring will be left up to the PIs of the trainees. Appears to be limited mentoring outside of the trainees PI and an annual presentation at the [regional] Stem Cell Consortium Symposium. • No plans in place to ensure that mentoring is outstanding for trainees. No description of ways to improve mentoring. • No plan in place to train mentors. • No plan to ensure great mentoring of students. • No description of what will occur if a trainee is not “performing” at acceptable levels. • No description of how to remediate failing trainee(s).

	• For postdocs, only an annual review will be performed for "monitoring". This needs to occur more often. • Limited plan to track students- only mailing list and database- this is not a tracking program; mentors could be long term to maintain tracking of their mentees and support them, ensuring their success. • Trainees will be added to a "mailing list" and a "database" will be created (no details are provided). This is not acceptable. • Updates will be asked for "periodically". A plan needs to be in place. • Remaining years will be funded by either the PI, or as stated by the PI, the grad school (letter included from the Grad school). Unfortunately, the grad school letter does NOT note that the remaining "two" years will be funded.
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 14	• Trainees will receive extensive training in a number of aspects of stem cell research. • Extensive coursework is in place (5 required courses). • Focus on science policy and teaching trainees how to talk about their science to the lay public is an excellent idea. • The stem cell center at the institution is a strength. The majority of the program curriculum is already in place. There is a significant stem cell community to support the program. • Strong partnerships exist with other academic institutions. • The institution has a number of mechanisms to facilitate recruiting students from diverse backgrounds. There is excellent diversity in the participating labs and graduate programs. • Based on the mentors' track record and the leadership structure, this project will certainly achieve its goals. • The TRANSCEND director has expertise in stem cell science and in forming and administering graduate programs. She is well equipped to lead the project. • Two associate directors provide broader technical expertise and additional experience in developing graduate training programs. • Strong leadership. • Partnerships with clinical and industrial partners are generally lacking (outside two research institutions).
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 10	• This is a new program. The team provided general data which demonstrate strong student outcomes from the participating lab groups, including placement in stem cell-related fields in industry and academia. • Good record of training over 100 grad students and 50 postdocs, most who are pursuing careers in biotech and academia (although unclear how many are in stem cell/regenerative medicine-relevant fields). • Have hosted and trained over 100 CIRM Bridges students. • Has had a stem cell center since 2006. Noted that the center has "provided resources and training for 86 Ph.D. students and 46 postdoctoral fellows." • In the table, only 28 faculty appear to have mentored students over the last reporting timeframe of 11 years. 14 of the faculty appear to have mentored the vast majority of the trainees (noted that that there will be 25 labs participating). • No CIRM track record and data presented is hard to understand.
No: 4	• No track record - this is a new program. • Not applicable.

Application #	EDUC4-12766
Title (as written by the applicant)	CIRM Regenerative Medicine Research Training Program
Public Abstract (as written by the applicant)	We seek to establish a CIRM Scholars Training Program with 11 positions: nine postdoctoral and two clinical scholars. Our institution is an ideal environment for a CIRM Scholar Training Program because of the close alignment of our institutional mission and scientific expertise with CIRM's objectives. Our mission is, "To drive a new era of discovery in disease-oriented science and to mentor tomorrow's leaders in an inspiring and diverse environment." Our institution is unique because our scientific program is rooted in exemplary basic research while maintaining a focus on curing disease. We embrace the evolving landscape of science, leveraging the latest technologies to solve the most challenging biomedical problems. Indeed, stem cell research has been at the center of our approaches to understanding disease and discovering novel therapeutic approaches for over 15 years. Scientists at our institution conduct discovery research in many of the most important medical problems of modern times, including cardiovascular disease, immunology, virology, and neurodegenerative disorders. Research in each of these areas addresses promising targets for regenerative medicine. Our institution includes a state-of-the-art Stem Cell Core facility, used to train the next cohort of stem cell scientists. Our location provides an ideal environment for CIRM Scholars to develop collaborations, blending expertise of the clinic and basic sciences.
Statement of Benefit to California (as written by the applicant)	A major goal of regenerative medicine is to repair damaged tissue. Our CIRM scholars have research programs that focus on developing new methods to differentiate human induced pluripotent stem cells (iPSCs) into specific cell types for regeneration of diseased tissues. Our program will benefit the California economy by training highly skilled scientists who will take leading positions in California's research institutions and the biotechnology industry. These scientists will also create technology that will be the basis of creating jobs in the biomedical industry. For instance, new stem cell lines could be valuable for biotechnology companies and researchers who are screening for drug compounds for regenerative medicine. Furthermore, our CIRM scholars are working closely with California companies to develop new equipment and analysis software that could be the basis for new product lines or new businesses. As new regenerative therapies come to fruition, we anticipate that California medical centers will be leading the way. Ultimately, the most important contribution of our CIRM scholars may be to improve the health of Californians. Diseases that are the target of regenerative medicine are major causes of mortality and morbidity, resulting in billions of dollars in healthcare costs and lost days at work. As we continue our efforts in medical research, we hope to one day unlock the secrets of tissue development and repair. This knowledge will help medical researchers develop beneficial therapies beyond what is currently available and potentially improve the quality of life and life expectancy of patients who suffer from disease.
Funds Requested	$5,000,000
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation of the GWG." Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 85

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	86
Median	85

Standard Deviation	4
Highest	92
Lowest	80
Count	15
(85-100): Exceptional merit and warrants funding, if funds are available	9
(1-84): Not recommended for funding	6

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 14	• The strength of the training program derives from the extraordinary research environment for stem cell science and regenerative medicine. Faculty mentors include world leaders in their fields such as two Nobel laureates. Many of the programs (in applicant's apt words) are "rooted in exemplary basic research while maintaining a focus on curing disease." In this respect there is an excellent match with CIRM's mission. • Close ties to local research institutions, as well as close ties of many faculty (including training program director) with the biotechnology industry, should strengthen awareness of therapy development and patient needs. • Didactic educational aspects of program are presented without clarity regarding in which activities trainees actually are expected to engage. While postdoc & clinical trainees don't have same needs for this type of training as grad students, program would be strengthened by greater structure in courses, participation in seminars and other activities in San Francisco Bay area, etc. • Well designed program at an exceptional institution dedicated to understanding and treating human disease; trainees will be highly likely to have scientific careers in stem-cell relevant work in academia, healthcare, and/or biotech/biopharma companies. • Hard to evaluate potential because application is not well written.

No: 1	• This is a very difficult review. The applicant institution has a stellar reputation. However, the application often provided insufficient details to know how the team will meet the goals of the CIRM scholar research program. For example, while there is known deep expertise in stem cells and regenerative medicine, the description of the training program was at a high level without detail
	  • It is unclear what educational opportunities are required for all students and what are elective.
	  • It is unclear how many of the available activities will benefit trainees. It is unclear how trainees will obtain access to clinicians who see patients, i.e. how these opportunities will actually take place.
	  • Another example, "CIRM scholars will have opportunities to develop their own mentoring styles" - what does this actually mean and how will this necessarily be effective?
	  • With regard to the course work, some areas were strong and others were weak. For example, CIRM scholars can receive instruction in experimental design, quantitative approaches, and data analysis through this series of workshops organized by the institution's bioinformatics workshops. More detail on what the work shop will look like would be helpful. There is a day long work shop on how to write a winning NIH grant. It might require additional experiences on writing a winning grant.

GWG Votes	**Is the program well planned and designed?**
Yes: 7	• Very well designed program that will enable achievement of program goals. • Strong potential community outreach, but connection to trainees could be better described. • Poorly developed DEI plan, with no consideration of candidates' contributions to DEI in the selection process. • A number of areas are unclear.
No: 8	• Many aspects of training program could have been described in considerably more detail.

	• All the elements are in place but the recurring theme is the failure to provide sufficient detail to know exactly what the team will be doing and how they will achieve the aims for this CIRM program. • Beyond the experience of working under a mentor in an excellent, perhaps world-class, laboratory, trainees seem largely left to their own devices and judgment to fill out the training experience. Trainees will have exceptionally good access to seminars, journal clubs, and relevant coursework. Program could help make that integral to the day-to-day experience of any motivated trainee. • Similarly, patient engagement and community outreach/education opportunities are available, but participation seems to depend largely on individual projects and initiative of trainees. • No formal Diversity/Equity/Inclusion plan given. Appears to be pending institutional development of DEI program, initiated in 2021 with the hiring of the institution's first Director of DEI. • Design of program not clear in the material presented. • Many generic statements about CIRM specific related training, poorly written.
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 14	• Excellent track record and reputation for training postdoctoral researchers, including clinical fellows. • Well resourced institution, strong affiliation with nearby academic/medical institution. • Cadre of mentors outstanding. • Scale of program (11 trainees at steady state, 9 postdoc and 2 clinical) seems reasonable, with all fellows potentially finding homes in very strong labs. • Strong leadership structure that includes former CIRM Scholars on the admissions committee. • Program director led successful CIRM Scholars program 2006-2016, and remains a highly productive researcher in the relevant field. Others in leadership team are also strong. • Recruitment of students from diverse backgrounds is not described clearly. The institution clearly can select outstanding fellows from top institutions around the US and internationally. Appears that the extent to which institution's new DEI program will impact selection criteria for trainees remains to be determined. • Hard to tell given what was presented.
No: 1	• There is insufficient detail to know exactly what the team will be doing and how they will achieve the aims for this CIRM program.
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 15	• As there is a strong track record for training predoctoral students, there is a strong belief that a good educational experience can be developed. However, the application should be reviewed on the basis of what we think will happen at this institution. • Grant from 2006-2016 trained 41 CIRM Scholars, which is roughly consistent with the scale of the proposed program. Quality of work published by many of the trainees and their subsequent placement in excellent academic institutions or biopharmaceutical companies demonstrates great success of the prior program. • Outstanding track record. • Successful training of 41 previous scholars (many made important discoveries in STEM cell biology); notable that ~40% have built careers in biotech companies (often in leadership roles). • Excellent overall environment for postdoctoral researchers.
No: 0	*none*

Application #	EDUC4-12811
Title (as written by the applicant)	Training Scholars in Regenerative Medicine and Stem Cell Research
Public Abstract (as written by the applicant)	The goal of the program is to give trainees a well-rounded understanding of regenerative medicine approaches, stem cell biology, and their clinical and ethical implications. The activities enabled by this training program will provide trainees a unique approach and set of tools to subsequently pursue regenerative medicine and stem cell biology in basic research, biotechnology or pharmaceutical enterprises. This training will lower future barriers for graduate students and postdoctoral fellows to engage in regenerative medicine research. This program will be interdisciplinary in nature and will expand the existing postdoctoral and graduate programs with training on understanding and controlling the cellular processes involved in human embryonic and adult stem cell self-renewal and differentiation, their application for expanding our mechanistic understanding of disease, the development of novel drugs to target those pathways, and ethical considerations. Trainees will also engage in a variety of outreach activities to help educate and inspire the broader local community (K-12 students and undergraduates) on topics relating to regenerative medicine, with the goal of reducing disparities and disproportionate access to science. Predoctoral trainees will be fully integrated with the graduate school, an interdisciplinary program that provides rigorous training in chemistry, chemical biology, synthetic biology, neurosciences, immunology, cell biology, and biophysics. The Doctoral Program in Chemical and Biological Sciences has ranked top-10 in chemistry and biology for the last 20 years (U.S. World and News). CIRM trainees will have access to the full spectrum of research at the institution. Uniquely, trainees will have the opportunity to collaborate with the drug discovery division to take their scientific discoveries from the bench to the bedside. Though this process, they will gain exposure to all the challenges and opportunities of developing stem cell-based therapies and advancing them into the clinic, where they will gain an understanding of patient needs and contribute to the development of innovative new therapies for regenerative medicine in numerous diseases settings. The CIRM EDUC4 training program will augment our existing training programs with access to courses and support for advancing regenerative medicine and include collaborative research projects between chemistry and biology graduate students and postdoctoral fellows. Such collaborations will provide a unique opportunity for trainees to assimilate the tools and approaches of both chemistry and biology in the context of important problems in stem cell biology. These joint projects may include chemists and biologists from neighboring institutions, which, because of their close proximity, allow frequent and direct interactions.
Statement of Benefit to California (as written by the applicant)	The proposed research and training program will provide interdisciplinary training for a diverse group of graduate and postdoctoral fellows in regenerative medicine with the goal of advancing stem cell research and increasing the number of scientific leaders and researchers in stem cell research. The program will give trainees a well-rounded understanding of regenerative medicine approaches, stem cell biology, therapeutic development, and their clinical and ethical implications. Trainees will not only gain experience in chemistry and biology, but also have the opportunity to engage with translational research and precision and digital medicine. The activities enabled by this training program will provide trainees a unique approach and set of tools with which to subsequently pursue regenerative medicine and stem cell biology in basic research, biotechnology or pharmaceutical enterprises. Trainees will engage in a variety of outreach activities to educate the local community on topics relating to regenerative medicine, with the goal of reducing disparities and disproportionate access to science. We expect that these trainees will become the future scientific leaders and researchers in the field of regenerative medicine who will address critical unmet medical needs using stem cell and regenerative medicine-based therapies for the benefit of the public. The State of California will benefit not only from the scientific and therapeutic advances that trainees will make, but also the cultivation of talented young people in the field and development of a well-trained workforce.
Funds Requested	$4,931,353
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available

Process Vote	AI GWG members unanimously affirmed that "The review was scientifically rigorous, there was sufficient time for all viewpoints to be heard, and the scores reflect the recommendation of the GWG." Patient advocate members unanimously affirmed that "The review was carried out in a fair manner and was free from undue bias."

SCORING DATA

Final Score: 85

Up to 15 scientific members of the GWG score each application. The final score for an application is the median of the individual member scores. Additional parameters related to the score are shown below.

Mean	84
Median	85
Standard Deviation	5
Highest	95
Lowest	72
Count	14
(85-100): Exceptional merit and warrants funding, if funds are available	8
(1-84): Not recommended for funding	6

KEY QUESTIONS AND COMMENTS

Proposals were evaluated and scored based on the key questions shown below, which are also described in the PA/RFA. Following the panel's discussion and scoring of the application, the members of the GWG were asked to indicate whether the application addressed the key question and provide brief comments assessing the application in the context of each key question. The responses were provided by multiple reviewers and compiled and edited by CIRM for clarity.

GWG Votes	Does the proposed program hold the necessary significance and potential for impact?
Yes: 11	• Program will offer first class high level training in chemical biology, institution has a track record in development of compounds with application in regenerative medicine. PI has a longstanding commitment to application of chemical biology in stem cell research. • In addition to drug development, the discovery of small molecules for driving expansion or differentiation of stem cells in vitro through this program may be key to addressing cost of goods issues in manufacture of cell therapeutics • The drug discovery division of the institution is a world class facility for exposing students to preclinical and clinical drug discovery. • Drug discovery program provides real world experience in drug development. • Students are exposed to programs that advanced into the clinic, and thus see in real time the impact of stem cell therapies. • Alumni of the program have had great impact because of the small molecule aspects of the program and their use in clinical trials. • Program strong but somewhat limited in scope to chemical biology and drug development, an issue in the past which the team have tried to address. • Opportunities for broader engagement with stem cell groups in the area could be better exploited, or, the applicants could explain in more detail how they will work. • 2020 proportion of URM only 17%. Good outreach to San Diego K-12 to address pipeline issues.
No: 3	• The proposed training program is strong in the fields of chemical biology and drug discovery. However, effective integration with target identification, stem cell biology and stem cell-based assay development is not well documented for trainees. • This application from an outstanding institution is disappointing because the program described appears overly narrow and does not offer sufficiently strong training in stem cell biology and regenerative medicine. • Focus only on one specific area, chemical and drug discovery.

	• Not really a yes or no - its more of a maybe: The program will train researchers in biochemical approaches to identifying potential therapies, but unclear how well the program aligns with the overall CIRM mission and goals.
GWG Votes	**Is the program well planned and designed?**
Yes: 11	• Establishments of functional cell-based screens to identify small molecules, genes, and signaling pathways that regulate self-renewal, fate determination, and migration of human and murine embryonic and adult stem cells is a hallmark of the program. • Exposure and involvement of students to high profile CIRM funded projects at the intersection of bench to bedside • Reasonable overall program with expected curriculum and co-curricular activities. • Scholars will have access to translational drug discovery via the onsite drug discovery division. • Requirement for mentoring committees, but no mentor training, no IDP requirement, and little focus on trainees' career development. • Assessment of mentoring appears to be more about policing requirements than improving mentoring. • Some aspect of proposal do not link well with stem-cell biology.
No: 3	• The institution and drug discovery program offer great training in a limited sphere. Good track record of compound discovery and development in regenerative medicine field. Impact of these discoveries perhaps not totally clear but like all drug development this is a high-risk area with long timeframes to success. • 14 potential mentors with some diversity of expertise, most are in the chemical biology field. • Few of the mentor candidates cite "stem cells" or "regenerative medicine" in their brief statements of Research Focus (only 4/13, of which two use already developed models of neuronal lineage cells derived from iPS cells). Application is vague on how most trainees will acquire expertise to develop appropriate stem cell-based models for drug screening, let alone a broad "quality, first-hand internship experience" in stem cell biology. • Stem cell-focused didactic work is limited to a single course at another institution. None of applicant institution's own course offerings listed show a main focus on stem cells/regenerative medicine. • Coursework somewhat limited in scope. Not much detail provided, stem cell courses outsourced to two other institutions, no letter of support from latter and letter from former is generic. Elective courses have strong focus on drug discovery. • Multi-institutional stem cell educational network is a significant asset for all training programs in the area. However, application is vague on how CIRM scholars at the institution will actually utilize this resource. Similar need for specifics on relationship with a consortium for regenerative medicine. • Application presents considerably greater detail on infrastructure for chemical discovery than for stem cell research. The institution has outstanding resources. However, the strong focus in application on chemistry assets downplays need for other core capabilities and expertise central for the training and research projects of CIRM Scholars. • The program director is widely recognized as a major world leader in chemistry and drug discovery, notably in application to stem cell biology and regenerative medicine. However, do their responsibilities as President/CEO of the institution leave enough time for fully engaged leadership of the training program? Co-Director is relatively junior (Asst. Prof.) member of Dept of Chemistry. Do they have breadth and experience to lead a training program with a major biological component? • Steering Committee members have impressive expertise, but strongly overlapping with that of the Program Director & Co-Director. Seems to be a conspicuous absence of leadership in the training program with primary focus in stem cell biology or regenerative medicine. Makes the program appear excessively narrow. • Outreach activities mainly limited to educational activities via the institution, not much patient engagement. • Good outreach activities in summer program, high school and K-8. • Community Teaching laboratory a laudable initiative. • Mentoring and advising are standard, career development not addressed. • DEI plan could be better articulated with more specifics. Postdocs recruited by faculty; graduate school only comprises 13% URM.
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 13	• Easily achievable. • The program should be able to accomplish what it aims to do.

	• There was discussion about how much stem cell biology was really involved here, but the enthusiasm for the biochemical approach as an alternative path to therapeutics resonated. • Chemistry/drug discovery resources are outstanding and it is likely that some trainees will make valuable discoveries of compounds that eventually can be repurposed for regenerative medicine applications, and/or of "hits" that could be advanced towards therapeutics. • However, seems overly optimistic to anticipate that more than a small minority of trainees will actually experience "bench to bedside" translation opportunities in their own projects while in the training program (with possible exception of repurposing opportunities). Time frame for progression from assay development through hits/leads to candidates suitable for first-in-human studies is generally longer than expected training periods. • Infrastructure for chemistry is excellent-great core support facilities, high throughput screening compound libraries. • Graduate School provides support for interdisciplinary study, high ranked in chemistry and biology. • Exposure to The Community Teaching Lab which is an open laboratory space that enables in-house training courses and STEM outreach programs. • Three CIRM specific somewhat "unique" courses that focus on statistics, molecular medicine and a chemical biology course that: provides a broad overview of the field of chemical biology, with a focus on small molecule drug discovery is unique among most stem cell programs. Topics covered include activity-based protein profiling and mass-spectrometry-based proteomics. • Formalized career development plan. • Leadership very strong but mostly chemists from a similar background. No outstanding stem cell scientists in leadership roles. • Broader collaborations with stem cell institutes, or academic medical center, would strengthen the case here. Several MDs listed as potential mentors but level of engagement is not clear. • DEI could be better articulated; no program official with specific DEI responsibility. recruitment through conferences targeting underrepresented minorities and minority serving institutions. • There is an improving record of inclusion in graduate admissions, but the proposal does not provide a plan to meet its outcomes (for example, no holistic review; no consideration of relevant student characteristics, such as persistence, in selection). • Unclear how it will "prioritize research relevant to URM populations."
No: 1	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 14	• The institution was the recipient of a 2007 and 2011 Type II CIRM Training Grant, which supported a total of 31 trainees roughly evenly split between graduate student and postdoctoral fellow trainees. These programs were considered highly successful. • 5 (16%) are now tenure/ tenure-track faculty; 6 (19%) are research scientists or directors in academic or clinical research organizations; 4 (13%) hold executive level positions in biopharma; 8 (26%) are scientist or directors in biopharma; 1 (3%) is in consulting; and 7 (22%) are unknown. • 30 trainees. Many biotech placements. Doctoral trainees: 35% in pharma/biotech, 21% academia. Postdoctoral trainees: 37% industry 32% academia. 7-10% URM, 22% lost to follow-up. • A number of former CIRM Scholar trainees from the institution have advanced to good positions in academia or in biotech/biopharma. Not yet clear how many are now demonstrating highest level of innovative leadership (although some of the program director's own former trainees have done so). • Track record of moving alumni into pharma is excellent. • Application presents evidence that the institution leadership takes Diversity/Equity/Inclusiveness seriously and that the institution has made significant gains over past decade in recruiting members of underrepresented groups into training programs. Absolute number of such recruits is still relatively low. • Relatively large fraction (>20%) of previous trainees apparently have not been tracked successfully.
No: 0	*none*