APP #	TITLE	BUDGET REQ	FUND?	SCORE (MEDIAN)	Mean	SD	Low	High	Y	N
EDUC3-13179	Stem Cell Summer Research Experiences	$508,750	Y	95	96	2	93	100	15	0
EDUC3-13114	Supporting Underrepresented STudents Adapting to Change: Summer Program to Accelerate Regenerative Medicine Knowledge (SUSTAIN a SPARK)	$255,750	Y	95	95	2	90	98	14	0
EDUC3-13117	Train, Educate, and Accelerate Mastery of Stem cell research (TEAMS) program	$508,750	Y	95	94	2	90	97	15	0
EDUC3-13101	Mentored High School Summer Research Program	$508,750	Y	94	94	1	90	96	15	0
EDUC3-13126	Summer Program To Accelerate Regenerative Medicine Knowledge (SPARK)	$506,712	Y	90	91	2	90	95	15	0
EDUC3-13127	Stem Cell and Regenerative Medicine Summer Internships for High School Students from Under-Served Communities	$508,750	Y	90	91	2	88	95	15	0
EDUC3-13234	Summer Training and Research Inspiration for Diverse Pipeline Engagement toward Advancing Stem Cell Treatment (STRIDE)	$509,000	Y	90	89	1	87	90	15	0
EDUC3-13123	Stem Cells & STEM Education - a Summer Internship Program for California High School Students	$509,000	Y	85	87	3	82	92	13	2
EDUC3-13168	Stem Cell and Regenerative Medicine - High School Summer Research Internship	$508,750	Y	85	86	4	75	95	13	2
EDUC3-13153	Internship at a Cutting Edge CIRM-funded Stem Cell Research Facility	$508,750	Y	85	86	4	80	95	8	6
EDUC3-13129	Exposing Students to Regenerative Medicine (ExStRM)	$499,500	Y	85	85	7	74	95	9	6
EDUC3-13247	High School Summer Fellows in Biomedical Research	$508,750	N	80	77	5	65	85	1	14
EDUC3-13236	Stem Cell Summer Academy for High School Students	$304,790	N	75	74	4	70	80	0	15

Application #	EDUC3-13179
Title (as written by the applicant)	Stem Cell Summer Research Experiences
Public Abstract (as written by the applicant)	Through this training program, 50 high school students from backgrounds underrepresented in the sciences will pursue summer research projects in stem cell biology at a major research university. Students will spend the bulk of their summer conducting research under the guidance of a mentor scientist. To prepare them for success in the program, they will begin the summer with an orientation that will help students feel confident entering and navigating the laboratory environment. Throughout the summer, interns will meet regularly to: 1) learn about and develop their skills as science communicators; 2) learn about stem cell research and the translation of research to patient care; and 3) participate in patient engagement activities and community outreach initiatives. Students will attend a series of talks where researchers will share their personal stories about how and when they became interested in science, their unique pathway to their career in science, and a rich description of their research. Presenters will highlight ways in which their research contributes to our understanding of regenerative medicine and the development of stem cell treatments for patient care. Students will also hear from patients, patient advocates and participate in patient engagement activities. They will do community outreach work such as writing blog entries about their experience as an intern and posting photos on Instagram of their work in the lab. Longitudinal studies of alumni from this program demonstrate that they pursue higher education and careers in the sciences in numbers that greatly exceed their demographically-matched peers. Thus, we are confident that many of these 50 students will continue working in biomedical research or related fields. Irrespective of their career choices, all CIRM-funded alumni will build their lab skills, learn research practices, and understand the importance of stem cell research and accelerating stem cell therapies to patients with unmet medical needs, thereby becoming "stem cell ambassadors" who can help others in California understand this work and advocate for continued funding.
Statement of Benefit to California (as written by the applicant)	This proposed project will further the educational and scientific careers of high school students from backgrounds underrepresented in the sciences. This project will increase student access to educational resources that are not typically available in public high schools. These summer research experiences, coupled with programming to support students' understanding of science and scientific careers, will develop science literacy amongst young adults. Many will be politically active and engaged for years to come. Students will gain a comprehensive understanding of how science is done, how it changes over time, how scientific knowledge comes to be, and how to think critically. Research scientists will mentor these high school students, many of whom will come from backgrounds different from those of the scientists. Through engaging in this mentorship and participating in workshops focused on mentoring, these early career scientists will develop their mentoring skills and their abilities to educate lay audiences about their research. Supporting high school students and scientist mentors will ultimately diversify and build the life science workforce in California. This program will develop STEM talent by focusing on students that may get overlooked in school or other summer programs that do not explicitly recruit students from backgrounds underrepresented in the sciences. The summer experience will increase students' self-confidence in science, help them develop a sense of belonging and inclusion in science, and increase persistence to STEM degrees. Diversifying the scientific field is of critical importance to the state of California and its citizens for several reasons. Most critically, a more diverse biomedical workforce has been repeatedly cited as a mechanism for addressing disparities in health and healthcare. In addition, shortages in the life science workforce from technicians to advanced scientists are predicted in California; and the annual wages in STEM fields greatly exceed the national averages in other fields, providing economic stability and the potential for upward mobility for the low-income, minorities, and immigrant students who participate in this program. This program will help high school students realize their academic potential – resulting in their matriculation to college, completion of their undergraduate education, and ultimately, enabling them to pursue careers in the sciences.
Funds Requested	$508,750
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	96
Median	95
Standard Deviation	2
Highest	100
Lowest	93
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	• Outstanding stem cell labs and science training. Outstanding peer mentor training and community outreach program. Strong diversity of socio-economic background and first-in-family college education. • Provides excellent stem cell and science communication skills to the interns. • Significant stem cell experiences from a rich environment. • Yes. There are more than one hundred stem cell labs at the institution and this program will educate trainees about stem cell culture. This authentic stem cell research experience will have a positive impact on trainees' awareness of stem cell research. • Trainees will participate in several activities designed to develop their understanding of clinical applications of stem cell research. This will include meeting with clinical colleagues who are experts of clinical research. • This program has a diverse panel of trainees, with more than 88% of trainee's families receiving financial assistance from government programs.
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 14	• All of the necessary and ideal components are in place. • Well-defined program and track record. • This program is appropriately planned. Each trainee will work in a lab with a scientist mentor who helps them learn the content and skills necessary to carry out their unique stem cell research project. • Targets meetings with mentors and assigns a young graduate student as second mentor. • Graduate student mentors receive mentorship training. • Augment student's ability to pursue scientific career by helping them with college personal statements, especially since many are coming from families who have had no college experience.

	• This program includes Auxiliary Education activities. The trainees will attend regular meetings with program staff, and they will also be supported for applying universities, and selection of colleges. • Yes, this program has a suitable mentorship. This program has a very strong mechanism for tracking progress of all past trainees.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 14	• Yes, a logical extension of a successful program for the past 10 years. • Yes, has outstanding track record and provides support for college applications. • This program has strong support from the institution and has access to research resources, including support from many research labs. • Well-established. • The program director is appropriate for managing this program. • This program will develop their recruitment plan. They will use strategies that make explicit who the program is in place for, and the benefits of participating.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 14	• 85% matriculation rate, with many students attending California universities. Long-term data shows that 79.5% of alumni ultimately graduate with degrees in the sciences. • From the trainees with a track record, this program is successful. The have 80 trainees in the past. The majority of them went to a well-known university for college study. • High percentage of disadvantaged students in previous years and high percentage in STEM and college. • Excellent track record in getting 85% to college and many embracing scientific degrees.
No: 0	*none*

Application #	EDUC3-13114
Title (as written by the applicant)	Supporting Underrepresented STudents Adapting to Change: Summer Program to Accelerate Regenerative Medicine Knowledge (SUSTAIN a SPARK)
Public Abstract (as written by the applicant)	Our institute is a non-profit hospital located in one of the most socially and ethnically diverse areas of the country. Since 1981, our program has provided research training to over 1000 high school and undergraduate students from groups who are underrepresented in the Science, Technology, Engineering and Math (STEM) workforce. Our curriculum provides hands-on immersion into working laboratories, structured activities designed to stimulate interest in science, and support to pursue careers in biomedical research. The long-term goal of the program is to increase the diversity of bioscience researchers. The program was awarded both the previous CIRM Creativity and SPARK Awards and it has been very successful – 100% of our CIRM alumni who have matriculated to college with declared majors have chosen to study in STEM fields. With continued funding from CIRM, the proposed SPARK program seeks to enroll six new high school students each year for the next five years. Participants funded by CIRM will be part of the larger internship program that typically hosts between 35 to 45 students. SPARK trainees will conduct their own research under the mentorship of an accomplished investigator; attend regular seminars, presentations, and discussions intended to impart a strong foundation in the scientific method; participate in career development workshops; and present their research findings in a public scientific forum. SPARK interns will focus on stem cell biology and regenerative therapeutics. Our hospital has a rich history of pioneering stem cell therapies for blood diseases, while our strong relationship with the institute's Stem Cell Center will allow for novel opportunities with gene editing innovations and bioengineering breakthroughs. Additionally, SPARK students will participate in structured patient engagement activities, as well as workshops and presentations unique to stem cell research. In this request for continued funding, we will build on the foundations that supported the longevity of our program, while also incorporating new training approaches for hybrid in-person and distance learning. Our curriculum has many additions, including an online curriculum management system, new investments in equity and inclusion training for both faculty and students, collaborations with other SPARK-funded institutions, and more comprehensive career development. Students that complete our program will have the tools to compete more effectively in the workforce, and will add to the gender, racial and cultural diversity that is needed in the growing biomedical sector of regenerative medicine. We have the experience, infrastructure, connections, proven results, and dedicated faculty to make this program valuable to the students and a worthwhile investment for the citizens of California.
Statement of Benefit to California (as written by the applicant)	In November 2020, California voters again approved a proposition to support California Stem Cell Research. The ballot measure provides roughly $5.5 billion in bond funding to the California Institute for Regenerative Medicine (CIRM) to 'support stem cell and regenerative medicine research in California…in order to bring stem cell and regenerative therapies to all people of this great state, particularly for communities that have traditionally been overlooked or underserved.' All citizens of California directly benefit from medical advancements that come from CIRM, but also from the scientific contributions by individuals who represent the full diversity of the state. To that point, there is abundant evidence that individuals from minority groups and lower-income backgrounds are grossly underrepresented in the health sciences and in biomedical research. The reasons for this phenomenon are complex, but are rooted in the lack of opportunities for research for under-represented students during the high school years. The result is a relative lack of perspectives and backgrounds among the professionals conducting the research, and a national research agenda that does not adequately consider all populations. The Summer Student Research Program (SSRP) at our institute aims to address the lack of diversity in science by providing a welcoming environment for high school students from underrepresented populations to pursue careers in biomedical research. Support from CIRM through the current SPARK initiative will ultimately result in more individuals from all backgrounds to contribute to stem cell science and translational therapies, for patients in California and around the world who have unmet medical needs.
Funds Requested	$255,750
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available

Process Vote	All Grants Working Group (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	98
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: 13	• This is an amazing longitudinal program. It is remarkable to see that alumni of this program continue to remain involved- they represent great potential role models. • The program operates in an ethnically and socially diverse catchment area. It has longstanding relationships with community schools with diverse enrollment. • Past cohorts have been mainly female and otherwise diverse. • Outreach to low-income, first generation students has been their recent focus for improvement. • Yes. The program offers a good mix of clinical and basic science exposure. • The clinical setting for this program enhances trainees' awareness of the medical impact of stem cell science. The alliance with a Stem Cell Center fosters basic science instruction and technical training. • This is a strong training program in all aspects. • This program has an excellent patient engagement component involving trainees, medical staff, patients, and bone marrow donors. A unique pen pal component heightens trainees' awareness of issues faced by transplant patients. • The proposal for patient engagement-- an anonymous pen pal system- is innovative and strong • The one-week boot camp at the start of the program is a good way to introduce students to stem cell research. • I love the required ethics course.
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 13	• Excellent program providing comprehensive introductory training and diverse options for lab projects. • The program offers terrific didactics including a stem cell boot camp and an ethics course.

	• The required ethics course is a strength. • The auxiliary training is multidimensional; it includes bioethics, presentation skills, basic laboratory training, and stem cell biology. • Outstanding patient and engagement activities are described. These include a pen pal component, which is an excellent addition. • A serious strength is the pen pal program for an interface with patients. • Well designed- no flaws. • Great laboratory mentorship. • The mentorship program is well established, an external evaluator has been appointed, and the applicants have made detailed plans for tracking. • The inclusion of an outside evaluator is a serious strength. One can see the thought given to evaluating the program, surveying the student attendees with validated instruments, and overall treating this program as an impactful didactic with measurable outcomes. • More detailed information on potential mentors and project areas would strengthen the application. The letters of support were helpful.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**

Yes:
13
	• Involving local science teachers and counselors in the recruitment process is a serious strength.
	• Yes. The affiliate stem cell center provided strong letters of support.
	• I see well-qualified leadership with a strong track record and excellent outcomes on federal training grants.
	• Recruitment for the program includes strong outreach to the community and holistic assessment of student potential.
	• This program is both practical and achievable.
	• Potential improvements:
	  ◦ It is unclear how students will be placed in mentors' labs.
	  ◦ It is unclear how many labs have agreed to take students.
	  ◦ It is unclear where participating labs are located.

No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 13	• They have done a great job with systematic tracking, including keeping permanent addresses. • Yes, they have had excellent outcomes. Most trainees enter STEM programs; many college graduates go on to higher education. • Significant numbers of past students have selected science-based majors in college. • The program has had diverse cohorts in the past; 80% of past trainees identified as underrepresented minorities. • Excellent track record. • Outstanding.
No: 0	*none*

Application #	EDUC3-13117
Title (as written by the applicant)	Train, Educate, and Accelerate Mastery of Stem cell research (TEAMS) program
Public Abstract (as written by the applicant)	It is well documented that trainees from groups underrepresented in the Science, Technology, Engineering and Math (STEM) fields leave the research workforce pipeline, with many progressively losing interest in research-intensive careers. To overcome this, we will leverage our institution's long-standing success in education and training toward engaging underrepresented individuals in the field of regenerative medicine. The Train, Educate, and Accelerate Mastery of Stem cell research (TEAMS) program's primary goal is to develop and maintain a robust pipeline of students excited about regenerative medicine research to become the next generation of researchers. We will inspire, educate, and motivate qualified candidates from southern California's diverse populations, enabling them to master critical regenerative medicine knowledge and skills using a multidisciplinary approach. Under the umbrella of a long-standing, renowned summer academy, the 10-week TEAMS program will select 10 high school students (over the age of 16) to participate in a 10-week program that places trainees in 10 (of 23 potential) laboratories focused on regenerative medicine research. Our goal is for TEAMS to become a focal point for mentoring and training a diverse pipeline of regenerative medicine researchers to address disparities in its application. Strong mentorship, especially through formalized programs, can enable trainees to navigate a research career pathway and strengthen their commitment to a regenerative medicine career as early as possible. Our institution is home to a diverse group of researchers who are exploring a broad array of regenerative medicine topics, and actively promotes diversity, equity, and inclusion in our workforce. Our mentors have historically embraced the opportunity to host CIRM-SPARK trainees, ensuring a superlative first-hand experience in pursuing a hypothesis-driven, regenerative medicine-focused research project. Early exposure to biomedical research allows trainees to fully appreciate all aspects of the scientific process, including developing a hypothesis, designing experiments, performing experiments, gathering and analyzing data, and drawing conclusions. By coupling this with clinical interactions, training in cutting-edge core facilities, participation in an established personal and professional development program, and community outreach opportunities, we will ensure that each TEAMS trainee is inspired by the untapped potential of biomedical research. Together, these experiences will provide a broad educational foundation as well as stimulate an interest in pursuing regenerative medicine-based research in the future. We have a robust history of supporting training of this kind, exemplified by our summer academy, a recently concluded CIRM-SPARK program, and other federally funded programs to engage students in the research pipeline. Many alumni of these programs (61.5%) currently remain in science-based career pipelines including biomedical research and medicine.
Statement of Benefit to California (as written by the applicant)	California leads the world in regenerative medicine discovery. Despite this significant accomplishment, our regenerative medicine treatments have been minimally evaluated in people of color. Most clinical trial participants are non-Hispanic European-Americans. Among researchers, disparities in training occur throughout the entire regenerative medicine research pipeline. Latinx/Hispanic- or African-Americans account for only a small number of research scientists and <2% of physicians conducting clinical trials. The population of southern California represents a melting pot that is culturally and racially diverse. A 2019 population estimate reported Los Angeles County to have a population of 10,039,107, which included 26% white, 48.6% Hispanic, 15% Asian, 9% African American, and 2% American Indian/Alaska Native/Pacific Islander, with similar demographics in neighboring counties. Located in southern California, our proposed Train, Educate, and Accelerate Mastery of Stem cell research (TEAMS) program recognizes our opportunity to enhance the scientific workforce by reducing the barriers to success for groups of people who face unique challenges in entering the regenerative medicine field. The benefits of diversifying the workforce include promoting innovation and global competitiveness and increasing the likelihood that biomedical advances will benefit our diverse population, including medically underserved groups. To promote the development of a diverse workforce that reflects our state and local communities, we will offer local high school students the chance to engage in science as a hands-on experience rather than as a lecture and textbook exercise. The TEAMS program will leverage our majority-minority community and our institution's diversity training programs and world-renowned

	regenerative medicine discovery resources. Trainees will gain a general understanding of a range of biomedical topics and expand their personal and professional development under the guidance of our dedicated faculty and staff. Carrying out experiments in a model system is not limited to simply applying a protocol to arrive at a particular endpoint, it is also necessary to understand both the ethical implications of the work and the potential impact it may have on patients. Thus, TEAMS trainees will also explore bioethical issues surrounding regenerative medicine, including representation and disparities. Our institution is nationally recognized for our clinical application of regenerative medicine in cancer and diabetes, and trainees will also interact with our clinicians and patient advocates working in the areas of bone marrow transplant, islet cell transplantation, and chimeric antigen receptor (CAR) T cell therapy. This opportunity will provide trainees with a unique perspective of the very real impact that regenerative medicine-based therapies have on the lives of patients. Our goal is to build a diverse regenerative medicine pipeline and address disparities in our community.
Funds Requested	$508,750
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All Grants Working Group (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: 13	• Yes. This program is established and highly effective in recruiting and nurturing high school students. • The answer to this question lies in the accomplishments of past members of the program. These have been outstanding, with matriculation into a very large number of outstanding programs for further education. • Based on the trajectory of past trainees, and on the research efforts of the program membership, this program seems very positive. The program includes both laboratory research and the opportunity to shadow clinicians and to meet with patient advocates.

	• The program recruits throughout the United States, which supports the identification of high-caliber applicants from many communities. The attention to Diversity, Equity and Inclusion (DEI) includes recruitment in local communities, emphasizing partnerships with local high schools and a feeder program with another institution. The application process is geared to identify students with a particular interest in regenerative medicine, and gives priority to local students from underrepresented groups. • The program recruits throughout the United States to find high-caliber applicants, and recruitment places special emphasis on underrepresented groups. There are also partnerships with local high schools and the institute's educational outreach programs. Individuals from underrepresented groups represent more than 35% of all the trainees in the umbrella program, which is the recruitment source for this SPARK program. • This program had about 30% trainees from underrepresented minorities in 2015. This number increased to 50% in 2019. • Yes. The program is appropriately focused on stem cell research. Mentors include 23 investigators with expertise in cancer stem cells, hematopoietic stem cells, tissue-specific stem cells, and pluripotent stem cells - thus providing a broad view of stem cell biology and regenerative medicine. The auxiliary education includes a robust focus on the translational and clinical impact of regenerative medicine. • Yes. The proposed program will include several summer research projects on different types of stem cells, such as cancer stem cells, blood stem cells, and human pluripotent stem cells. • The trainees will interact with the institute's clinicians and patient advocates and thus will gain a unique perspective of the real impact that regenerative medicine therapies have on the lives of patients. • This is an outstanding program with strong institutional support.
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 13	• Patient and healthcare engagement activities include shadowing clinicians and meeting patient advocates, as well as visits to blood banking, bone marrow transplantation, and pancreatic islet isolation facilities. These are on-point to foster commitment to the CIRM Mission. • Substantive efforts are made to provide trainees with appropriate patient and healthcare engagement activities in regenerative medicine, specifically, and through shadowing doctors in the clinic. This includes a significant focus on health disparities. • The array of strong mentors working in multiple aspects of stem cell biology and regenerative medicine is impressive. Each student should have access to a quality research experience. There is a strong online training program in advance of the 10-week research program. • This program is appropriately planned with some hands-on training in stem cells and also provides opportunities for the trainees to engage with patients. • There are many relevant activities, including weekly meetings in host laboratories, summer student seminars, public speaking opportunities, and workshops designed to provide exposure to various careers in regenerative medicine research. Students also will learn about cutting-edge research through the Distinguished Speakers lecture series. • This program includes Auxiliary Education: Introduction to methods, innovation, ethics, and translational impact of regenerative medicine, as well as research communication. This education comprises courses, seminars, group meetings, workshops, and core facility tours. • The program offers a weekly Career-Focused Training Workshop that should set a strong foundation for understanding research in the context of the broader community. • Feedback and monitoring of students seems well-considered. Each trainee will give a 15-minute oral presentation at the program's weekly seminar. Trainees also will meet weekly with a teaching assistant. • The program directors will be using institutional support to provide trainees with opportunities throughout the school year to work in research laboratories under the guidance of a mentor with expertise in regenerative medicine. • The proposal describes a thorough tracking program captured with a REDCap database. While the provided table lists a relatively high number of recent graduates for whom tracking data is incomplete, this may well be an anomaly attributable to the COVID pandemic. • Yes, this program has suitable mentorship. However, this program needs improvement in the procedures for tracking trainees. There are many past trainees in the table without known current positions.

	• Well designed, with a long track record.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 13	• Yes. The Program Directors seem to be strong scientists who also have excellent experience in education and leadership of summer training for STEM students. Both have direct involvement in stem cell research/regenerative medicine. • The program director is appropriate for managing this program and this institution will support extra training for this program. • This program has strong support from the institute and has access to research resources. • They recruited 23 potential laboratories focused on regenerative medicine research. These researchers explore a broad array of topics in regenerative medicine. • Trainees in the program will be preferentially recruited from under represented groups through regional recruitment strategies. In their 2019 cohort, 49% of students were from minority ethnic/racial groups, with more than 50% having socioeconomic needs. • This program will develop their recruitment plan in collaboration with other outreach programs at the institute. • Resources are excellent. Personnel appear well-qualified. There are strong partnerships with local high schools and a partner institute. • The institute has a 60-year history of summer programs. • Definitely achievable.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 13	• More than 60% of the alumni of this program currently remain in a science career pipeline, and many others have successfully gone on to higher education. Nearly 80% of past program members have reported attending college. • Track record of a previous CIRM program shows many students continuing in STEM fields at excellent colleges and universities. • The program has a strong track record of outreach and significant URM representation. • There is an excellent alumni tracking program in place. • Based on the trainees with a track record this program is successful. Many trainees stayed in STEM majors and went to good universities to pursue their bachelor's degree. However, there are also many trainees without a track record. • They could improve the tracking of alumni. • The program is set in the context of a larger, robust summer program (initiated in 1960) that appears to have an outstanding track record.
No: 0	*none*

Application #	EDUC3-13101
Title (as written by the applicant)	Mentored High School Summer Research Program
Public Abstract (as written by the applicant)	The CIRM SPARK program will be an intensive research experience for ten local high school students. This summer research training will be a prodigious addition to our existing high school outreach program, which has a track record of over five years of success in educating students from diverse cultural and socio-economic backgrounds, including classroom lectures, hosting field trips and an existing one-week summer research program. As a part of the SPARK program, the summer interns will participate in eight weeks of hypothesis-based mentored research in one of the fifteen labs in our institute, all focused on the use of stem cells for translational studies in regenerative medicine, with the hopes of accelerating delivery of stem cell-based therapies to patients with unmet needs. In addition to their research projects, students will receive a comprehensive research education. Students will spend at least one day learning about the inner workings of organizing/running a clinical trial and shadowing physicians/nurses in an Amyotrophic Lateral Sclerosis (ALS) clinic to interact with patients. During their eight weeks they will also visit various core facilities (comparative medicine, imaging, biomanufacturing center) to learn more about the research process and will receive attend faculty lectures. The students will be expected to attend their host labs' weekly journal clubs and lab meetings. They will also meet weekly in a group course to learn about different career paths in science and medicine, scientific reading, writing and presentations. Lastly, the students will attend a speaker series geared towards research interns and present posters of their summer research at Research Intern Day, both organized by our institution. Here the students will get to know other summer interns and present their data. Our vision is that the students involved in this summer research internship will learn the power of regenerative medicine and gain experience that will propel them forward to a successful scientific career. Additionally, through the use of social media, we hope that reports of this research also inform the citizens of California of the uses of stem cells for regenerative medicine and inspires other young people to become involved in research.
Statement of Benefit to California (as written by the applicant)	This research program will benefit the State of California and its citizens by 1) introducing high school students from diverse cultural and socio-economic backgrounds to the exciting world of regenerative medicine, 2) training them to become the next generation of scientists and 3) providing administrative and student community outreach via social media to inform all California citizens of the potential of stem cells and regenerative medicine. First, both our existing SPARK program and high school outreach program have a track record of over five and ten years, respectively, of success in educating students from diverse cultural and socio-economic backgrounds. We plan to continue with the SPARK summer program to recruit local high school students for summer internships from diverse backgrounds. Second, these summer internships will then be used to train ten local high school students to inspire them to become part of the next generation of research scientists with a particular interest in the potential of regenerative medicine. Lastly, through posting updates and blogs on CIRM's website, our institution's website and through other social media outlets such as Instagram and Facebook, this program will be a platform to educate the public of California at large about the use of stem cells for translational research and novel therapies for regenerative medicine.
Funds Requested	$508,750
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All Grants Working Group (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: 94

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	94
Standard Deviation	1
Highest	96
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: 13	• The applicants propose an intensive research experience for ten local high school students. The SPARK-funded program is an addition to the institution's existing high school outreach program, which has a track record of over five years of success educating students from diverse cultural and socio-economic backgrounds.
	• Mentored research in the program is focused on the use of stem cells for translational studies in regenerative medicine.
	• Mentors come from the institute plus affiliate departments and institutes to provide expertise in nine major programs: i) Brain; ii) Eye; iii) Lung; iv) Gut; v) Cardiovascular; vi) Blood; vii) Skeletal; viii) liver/ pancreas; ix) Cancer. Each of these nine programs includes ongoing research and technical support in pluripotent stem cells.
	• Accepted students had a balance of female/male, race, and socio-economic background.
	  ◦ Gender: Among 40 accepted students, 60% female, 40% male students.
	  ◦ Ethnicity: applicant cohort, 45% White, 28% Asian, 19% Hispanic or Latino, 9% Black or African American, and 7% were other races/or multiple races. In the accepted cohort, 38% White, 33% Asian, 18% Hispanic or Latino and 9% Black or African American, and 7% were other races/or multiple races.
	  ◦ Socio-economic background: Zip codes were used to estimated household income (U.S. Department of Housing and Urban Development (HUD). Of 127 applicants, 57% low, 36% moderate, and 6% high median income. For the accepted cohort, 60% low, 33% moderate, and 8% high.
	• The program offers excellent access to stem cell labs and science training; excellent peer mentor training and community outreach program; strong diversity of socio-economic backgrounds.
	• Significant and extensive exposure to stem cell biology and science in general.
	• Strong, well-designed program.

No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 13	• This training program has several outstanding components. It is a mix between lectures, hands-on visits and experiences, and engaged mentorship- all of which are extremely appropriate for high school students. • The program offers two types of mentorship- the research mentor, and the program director to keep students on track. • The program is very translational. Its curriculum includes an introductory day to organizing and running a clinical trial, experience shadowing physicians and nurses in an Amyotrophic Lateral Sclerosis (ALS) clinic to interact with patients, and interactions with a blood bank. Students will also participate in a mock clinical trial and design their own clinical trial.

	• The program has excellent training in stem cell biology, an excellent track record, and provides an excellent research experience to high school students. The training incorporates lab meetings, science seminars, stem cell biology, translational research, and production standards for commercial biologicals. • The program includes a variety of learning experiences- courses, tours, and special topics including biostatistics. • Students produce a report of their work for Research Intern Day and post a diary of their activities to the community blog. Both reports serve the dual purpose of highlighting the research for the community and enhancing student accountability for their engagement with the program. • The program posts updates on trainees' experiences on CIRM's website, the institution's website, Instagram, and Facebook. • For improvement: The applicants did not share a list of posters presented by past trainees- therefore it is not clear what past trainees actually did at the bench.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 13	• Summer interns will participate in eight weeks of hypothesis-based mentored research in one of fifteen labs at the institute. • Students will attend a speaker series geared towards research interns and present posters of their summer research at Research Intern Day. Students will also post a diary of hands-on activities. • Yes. This program is a logical extension of an established program with five years of success. • The larger program is established and thriving; this addition is highly feasible.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 13	• Yes, the program is consistently thriving, They are attracting more students from undeserved communities using paper advertisements, email outreach to all high schools in the area, and presentations in the schools. • 95% of past participants are currently enrolled at an accredited college or university. Roughly 90% of all participants are enrolled in a science-related major or plan to enroll in a science-related major after finishing high school. • The program has matriculated 40 trainees: 8 per year from 2016 to 2021 (excluding 2020 due to COVID-19). • All alumni have either graduated college, commenced their college education, or are seniors in high school. • The program provides constructive feedback to applicants who are not selected.
No: 0	*none*

Application #	EDUC3-13126
Title (as written by the applicant)	Summer Program To Accelerate Regenerative Medicine Knowledge (SPARK)
Public Abstract (as written by the applicant)	This proposal seeks to create a Summer Program To Accelerate Regenerative Medicine Knowledge (SPARK), which will provide an engaging educational experience for California high school students who come from socioeconomically disadvantaged backgrounds. Our program strives to create a future biomedical workforce in regenerative medicine which represents the diversity of the state of California. We will recruit 50 high school students (10 per year) from disadvantaged backgrounds who will participate in an 8-week regenerative medicine summer research fellowship. The core activity with the summer fellowship includes a mentored research experience where students will work in research labs within our network of regenerative medicine faculty. To complement the research lab experience our students will participate in a focused educational curriculum that will teach the fundamental concepts of regenerative medicine. Within this curriculum, we will integrate important concepts related to the intersection of regenerative medicine with ethics, health equity, and public health. Overall, this program strives to excite students about research, and help prepare them professionally for success as they proceed along the training pipeline towards careers in regenerative medicine. Along with the summer research experience, students will participate in a coordinated outreach effort which incorporates patients, families, and their local communities. Students will spend time shadowing physicians in clinic to help students appreciate the diseases and challenges our patients experience. Engaging family is crucial to student success, and we will incorporate student families throughout the summer program. To help connect our SPARK program with our local community we will have SPARK students teach elementary school students about fundamental concepts related to regenerative medicine. Together, these outreach efforts strive to create an impactful and lasting connection between our program and our local community.
Statement of Benefit to California (as written by the applicant)	The Summer Program To Accelerate Regenerative Medicine Knowledge (SPARK) seeks to provide stimulating research education opportunities for high school students in the state of California. This program focuses on students who come from low-income families or live in socioeconomically disadvantaged communities, who often do not have access to summer internship programs. Success with this program will help create a future biomedical research workforce that represents the diversity of California's population.
Funds Requested	$506,712
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All Grants Working Group (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	2
Highest	95
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	• Yes. This proposal seeks to create a Summer Program to Accelerate Regenerative Medicine Knowledge (SPARK), which will provide an engaging educational experience for California high school students who come from socioeconomically disadvantaged backgrounds. The program strives to create a future biomedical workforce in regenerative medicine which represents the diversity of the state of California. • The 23 listed mentors work in multiple aspects of stem cell research and regenerative medicine. It is expected that trainees will be fully immersed in the efforts at the institute to develop novel therapies for unmet medical needs. • Yes; the proposal describes an all-encompassing program with involvement of people from different stages in education pipeline and in different careers. • Having both a faculty mentor and more junior lab member mentor, as well as three SPARK staff members, gives the high school trainees a spectrum of mentors for guidance. • The program has a robust system for recruitment and for follow-up. This indicates a strong commitment to giving under-represented minority (URM) and socioeconomically disadvantaged high school students a chance. • This summer program seeks to impact the lives of high school students from socioeconomically underprivileged groups. • The program is designed to recruit students from disadvantaged backgrounds. • Excellent program. • High impact. • Students will be exposed and trained on 'cancer research'? Considering that the rest of the proposal is meritorious, the specific reference to cancer research in the Project Summary may be an error.
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 14	• The applicant has included an orientation boot camp for one week, mentored lab experience, and a regenerative medicine curriculum with knowledge-based tests and professional development activities. • All trainees will participate in a one-week boot camp to help prepare for the summer fellowship. This will include campus, clinic, hospital, and tours of the institute. Instruction will cover common laboratory techniques, research ethics, and lab safety procedures. Additionally, this curriculum will cover basic regenerative medicine scientific principles as well as soft skills required to navigate a research environment. • An initial bootcamp is followed by a curriculum going from concept to disease to approach and then tools. This should provide a good knowledge base. • Surveys and knowledge-based tests will be used to assess the efficacy of the curriculum. However it is unclear what value the tests will have since much would depend on former understanding. • Of note, the trainees will also be exposed to educational threads on topics such as ethics, health equity, and the public relation to regenerative medicine. This is a valuable effort. • Yes. Students will be placed in research labs based on the mentorship history of the principal investigator and the lab environment. Once placed, each trainee will have a go-to-person in charge of the day-to-day training.

	• Community outreach will be in conjunction with a partner organization. The trainees (and the medical school students involved in program) will teach elementary school-aged students about regenerative medicine, stem cells and gene therapy. • Professional development: The proposal includes a weekly lunchtime lecture series where trainees learn about different careers related to regenerative medicine, led by researchers and health professionals from the institute, as well as within the local community. • The applicant has looked to enroll and recruit the URM, economically-challenged student. • The plans for family involvement will add to success sustenance. • The program has a strong track record. • The application is extremely detailed; the applicant has even planned to transport trainees to the site via bus. • The application shows attention to detail.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 14	• The program is well-planned based on years of experience. • The Program Director has established working relationships with four inner city high schools. He also works with a nonprofit that works with teachers and students to close achievement gaps. • The proposal includes clear selection criteria: eligibility for free lunch program at school, neither parent graduated from college, in 10th or 11th grade. Each applicant will be ranked by their personal statement and a telephone interview. • Two medical students and one undergraduate will mentor each trainee; thus mentors will be relatively age-matched in facilitating patient engagement and outreach. • Trainees will be tracked for up to fifteen years via surveys, social media, phone and email. They will also be tracked via the National Student Clearinghouse. • Yes. The applicant has acknowledged the difficulty trainees may have traveling to the site, and this has been thoughtfully addressed. • The outcome benchmarks are ambitious.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 14	• The applicant has not previously received a SPARK award. The proposal describes an ongoing program at the institute that trains URM students in cancer research, to demonstrate their track record with research education programs and demonstrate feasibility of the current proposal. • Outstanding. The institute's high school cancer research program was in-person 2018 and 2019 but conducted virtually during the pandemic. Impressively, follow-up of the 2018-2019 students found 100% in college and 100% in science, technology, engineering and mathematics (STEM)-focused majors. • The track record for a similar program run by the same Program Director is impressive, which bodes well for this SPARK program. • The related program has a track record of success. The applicant is now expanding further into STEM topics. • The applicant has established a good track record and a good tracking system.
No: 0	*none*

Application #	EDUC3-13127
Title (as written by the applicant)	Stem Cell and Regenerative Medicine Summer Internships for High School Students from Under-Served Communities
Public Abstract (as written by the applicant)	This proposal is for a summer internship program that provides laboratory research experience in regenerative medicine and stem cell biology to high school students from populations that are traditionally under-represented in biomedical science careers. Rising seniors from under-served groups will be placed (8-12 students per year) in paid internships for the summer, conducting original research under the direction of established scientists and physician-scientists. Through mentored hands-on experimentation, the students will learn how basic research in stem cell biology can drive the discovery of new ways to detect and treat disease. In addition to the hands-on work in the labs, interns will learn to read and interpret the scientific literature, write a scientific abstract, and orally communicate their research at a formal symposium that caps the summer program. They will attend a daily didactic workshop in disease-focused stem cell concepts, and work with professional college counselors to build academic and professional skills to ensure that after their senior year they will matriculate to an undergraduate institution suited to preparing them for a career in science. Overall, this program is designed to increase the number of students from under-served backgrounds who pursue research careers, thus building a more diverse stem cell biology and regenerative medicine workforce of the future.
Statement of Benefit to California (as written by the applicant)	Our high school internship program was established with the goal of increasing diversity in the pipeline to biomedical science, and in particular stem cell biology careers. The program provides students from backgrounds that are under-represented in science and medicine with the opportunity to learn hands-on laboratory-based stem cell research and receive professional college preparation counseling. Through these efforts we aim to (1) encourage students to embark on the path to become scientists or physician-scientists with a focus on careers in regenerative medicine, (2) provide them with laboratory research experience that will both grow their interest in science and make them competitive for student research opportunities in college, and (3) assist them in gaining admission to outstanding colleges and universities that will prepare them for advanced study and potential careers in stem cell biology and regenerative medicine. Benefits to California include: 1. Increasing interest in regenerative medicine careers among students from backgrounds that are chronically under-represented in stem cell research. California is the most diverse state in the USA, with for example ~39% of the populace identifying as Latinx/Hispanic and another ~6% identifying as Black/African-American. This diversity of California's population is not, however, reflected in the scientific workforce. Empowering Latinx/Hispanic, Black/African-American, and other minority students in California to see themselves as future scientists (and giving them the tools to begin pursuing this goal) thus represents benefit for the state both in terms of expanding the available scientific workforce and in working towards removing structural barriers that prevent equitable opportunity for these students. 2. Developing and training a cohort of scientific mentors who are ready to promote diversity, equity, and inclusion in the scientific community in California. A challenge for efforts to remove barriers to participation in scientific fields is overcoming the inertia of the status quo/established culture of the scientific community. By engaging successful stem cell researchers in the process of mentoring would-be scientists from under-served communities, we hope to normalize the idea that removing these barriers and reaching out to these students is an important part of a practicing scientist's mission and citizenship. 3. Strengthening connections and understanding between California stem cell researchers and the community at large. The last few years have seen an erosion in public trust in scientific expertise in the United States, with disastrous public health consequences. Better communication and connection between the academy and the community is essential to reverse this trend. This goal will be served by generating cohorts of students who have seen stem cell research "from the inside."
Funds Requested	$508,750
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All Grants Working Group (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	2
Highest	95
Lowest	88
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	• Yes. The program is well-designed to provide students from under-represented groups experiences in stem cell and regenerative research, which will inspire many to pursue research and careers in medicine. It is hosted at an esteemed hospital that will provide opportunities for the trainees to gain experience serving their communities. • Yes. Since 2005 this internship program has impacted close to 200 under-represented minority high school students. The applicant has tracked trainees' college matriculation and professional trajectories. I think the results have been very impressive and speak to the success of this program and those involved. • The goal of the program is to remove barriers to participation in scientific fields by strengthening connections and understanding between California stem cell researchers and the community at large. • Yes. I'm impressed that the students engage with patients in a forum to discuss their research. It is a learning experience for both the trainees and for patients. How better to enable students working at the bench to understand the potential impact on life and disease, than meeting the patients? • The majority of past trainees have pursued a career in science, technology, engineering and/or mathematics (STEM). • The Program Director works full-time for the institute's summer programs. Both the Program Director and another program manager have committed sufficient percent time to the program. • Yes - the program specifically targets students from under-represented minorities. They can broaden their capture, as the institute serves a large area with diverse demographics. • The applicant is making a concerted effort to bring in applicants that they are not currently capturing. • Yes, the program aims to recruit diverse trainees from local schools through recruitment efforts in the region. • This a great program with a true dedication to recruitment and retention - and a significant minority student participation. • The application does not address how trainees are selected from the large applicant pool.
No:	*none*

0	
GWG Votes	**Is the program well planned and designed?**
Yes: 14	• A key plus to the program is that they select "star students" with a passion, not just students who are strong on paper. Kudos. • The program provides a mix of daily didactic workshops in disease-focused stem cell concepts with hands-on research in a mentor's laboratory. • The program offers an appropriate core curriculum with a one-week intensive laboratory skills "boot camp" session; a seven-week hands-on internship performing original research in a wet lab setting; workshops in biomedical principles with a focus on disease-oriented regenerative medicine research; and training in writing a scientific abstract and presenting a scientific talk. • The resources provided to support these students as they complete college applications is so important – the students need support through that transition and this program recognizes that. • The trainees have access to mentoring in preparing for standardized testing, college admissions, choosing a college, securing financial aid, and developing a career (via workshops with successful scientists and physicians). • The program is requesting funds to pay a student worker to track alumni progress and host various events to keep alumni engaged. This is a very innovative way to ensure engagement continues with alumni of the program. • This is a long-standing program with clear goals and objectives. • One possible way to augment the program is to publish a booklet including research abstracts each summer, along with the trainees' plans for college matriculation.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 14	• The program features >200 investigators in more than 50 discrete laboratories. The research in these laboratories spans pediatric problems including cancer (e.g., leukemia, lymphoma, sarcomas, brain tumors), cardiovascular diseases, metabolic diseases (e.g., diabetes, fatty liver), neurologic diseases (e.g., autism spectrum disorders), and inflammation and fibrosis (e.g., ulcerative colitis, Crohn's disease, necrotizing enterocolitis, idiopathic pulmonary fibrosis). • The program has highly competent staff with prior experience. The Program Director has trained high school interns since 2011 and played a key role in expanding opportunities for minority student access to internships at the institute. • Can the program add more under-represented minority mentors and faculty? • The major strengths of the program are investment in the students and robust alumni engagement. The integration of alumni into the program is unique and innovative. • Eligibility for the program will require that a student identify as a member of an under-served community, including racial and ethnic groups that are under-represented in STEM careers and stem cell research; students with disabilities; and students from low socioeconomic status backgrounds. • The applicant has been trying to capture a greater number of ethnicities and students with disabilities. • The applicant describes a robust recruitment plan at local high schools. • Trainees can bring their experiences back to their community schools to share with their peers via talks to their classmates. This will hopefully encourage future participation.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 14	• The alumni of the existing program have been tracked to their current enrollment in graduate or professional programs or their current positions as professionals. • The program has a great ambassador program. I love the fact that former trainees come back to engage with new student applicants. It will be worthwhile for the applicant institute to develop and provide more detailed plans for tracking trainee outcomes, successes, and achievements. • There is a limited track record considering the large body of trainees. • The program can improve in the tracking of their trainees.
No: 0	*none*

Application #	EDUC3-13234
Title (as written by the applicant)	Summer Training and Research Inspiration for Diverse Pipeline Engagement toward Advancing Stem Cell Treatment (STRIDE)
Public Abstract (as written by the applicant)	CIRM SPARK - STRIDE (Summer Training and Research Inspiration for Diverse Pipeline Engagement toward Advancing Stem Cell Treatment) program is a 5-week summer research and training program with an emphasis on diversity, inclusion, and equality, building on the strength and excellent records of our institution in recruiting, retaining, and training diverse and disadvantaged students. STRIDE program includes a diverse group of stem cell faculty from 3 areas (engineering, life science, and medicine) to provide hosting labs in 3 colleges, that is, College of Engineering, College of Natural & Agricultural Sciences, and School of Medicine. We include diverse graduate, medical, and undergraduate students to serve as teaching assistants (TAs) and mentors. We collaborate with the teams of excellent staff who direct and manage the existing outreach programs cross campus, such as Early Academic Outreach Programs (EAOP), School MESA Programs, Pre-college Programs, and School of Medicine Pipeline Programs. We have a diverse advisory committee for STRIDE program, including faculty, staff, outreach program directors, and diverse students representing different stages (undergraduate, graduate and medical students). Our diverse faculty and student mentors will provide research training relevant to stem cells and regenerative medicine in the areas of bioengineering, biomaterials, tissue engineering, regenerative medicine, therapeutics, neuroengineering, neurodegenerative diseases, epilepsy, neurophysiology, brain injury, stem cell biology and signaling pathway, bone diseases, developmental biology, cardiovascular diseases, diabetes, aging related diseases, toxicology, etc. STRIDE training will be interdisciplinary. STRIDE trainees will gain far visions in career and life journey by interacting directly with faculty mentors, student mentors including undergraduate, graduate and medical students, invited professional speakers including academic/industry leaders, policy makers, IP attorneys, medical doctors, nurses, entrepreneurs, patients and patient advocates. STRIDE program will also offer educational and enrichment activities, including short courses for research readiness, stem cell related research talks, workshops for communication skills, workshops for science to policy, career panels, mentoring sessions, discussions, community outreach activities, team building rope course, and how to use social media to enhance public awareness of medical needs and stem cell treatment. Our institution is a Hispanic Serving Institution with the two largest counties in California. The local area is one of the medically underserved areas with most diverse population in California. There is a critical need to build a pipeline of diverse stem cell workforce to serve this area and accelerate research and development of stem cell therapies to address the medical needs.
Statement of Benefit to California (as written by the applicant)	The institution is a research-intensive, federally designated Hispanic Serving Institution, with strength and excellence in recruiting and educating diverse and disadvantaged students. U.S. News & World Report has repeatedly ranked the institution as one of the top 10 universities in the United States for social mobility, and ranked the School of Medicine (SOM) among the top 10 in the country for diversity. Social mobility is a measure of the degree to which universities lift graduates into higher income brackets. National Science Foundation ranked the institution No. 3 in Hispanic STEM graduates in the nation. The institution has a significant positive impact on California that extends far beyond campus, from its economic driving force to its role in the community to the influence it casts on the future. The institution is the only public research university in the area, with pioneering research and diverse education programs that produce a significant impact both globally and locally. The institution fuels positive economic growth in the area and beyond. STRIDE (Summer Training and Research Inspiration for Diverse Pipeline Engagement toward Advancing Stem Cell Treatment) program is uniquely positioned with strengths of the institution to fulfill the CIRM SPARK program goals of inspiring, educating, and motivating high school students; broadening participation in stem cell, gene therapy and related research to diverse and disadvantaged high school students who might not otherwise have such opportunities; and accelerating stem cell treatments to patients with unmet medical needs. STRIDE program integrates multidisciplinary research projects with critical courses and educational enrichment activities to train and inspire diverse high school students to become part of the pipeline for undergraduate, graduate, medical students, and professionals in the areas of stem cell and regenerative medicine. STRIDE trainees will come from the local area, a disadvantaged region with great diversity and many families and communities with unmet medical needs. STRIDE program collaborates with many successful outreach programs at the institution to recruit diverse and socioeconomically challenged high school students, such as Early Academic Outreach Programs (EAOP), School MESA Programs, Pre-college Programs, and School of Medicine Pipeline Programs. STRIDE program builds the pipeline that provides well-trained diverse workforce to accelerate stem cell

	treatments to patients with unmet needs and attract biotech industries to the Inland Empire, a region historically with socioeconomic disadvantages. STRIDE program will collaborate with School of Medicine and Center for Health Disparities to help high school students learn about unmet medical needs and inspire them to think about future solutions to address healthcare disparities in the local area. STRIDE trainees are part of the pipeline that fuels the future economic growth in the local area and benefits the state of California in diversity of stem cell workforce.
Funds Requested	$509,000
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	89
Median	90
Standard Deviation	1
Highest	90
Lowest	87
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: 13	• They describe a robust engagement opportunity, including three colleges at the institution, each focused on a medical science area. • The weekly commitment to patient engagement activity involving a variety of activities seems well conceived. • Outreach to underserved areas of the local area through their Center for Health Disparities Research and their Center for Healthy Communities seems to appropriately position the program for successful recruitment. • Experienced leadership. • This is an attempt to set up a new program at the institution. Based on the track record at the institution, however, the answer is likely to be positive. • Excellent stem cell research on campus - high frequency of underrepresented minorities and socioeconomically disadvantaged students. • Good program with a highly diverse university that has a strong record in training URM students
No:	*none*

0	
GWG Votes	**Is the program well planned and designed?**
Yes: 13	• The program plan seems well conceived and includes a variety of appropriate experiences. • The Core Training Activities seem well articulated. • The plan is for a five-week program, as compared with 10 week programs in other applications. There are multiple appropriate faculty at this institution, which is federally designated as a Hispanic serving institution. • The five-week program is designed to prepare trainees for research activities in host laboratories. The five week program appears to be very well thought out. • Weekly courses planned, homework, framework powered by graduate and undergraduate students to encourage learning. • Detailed curriculum. • Community outreach provided. • They also have created Plan B virtual programs in case the pandemic prevents in-person training, and all of the training videos will be recorded and available. • Well-planned and designed. • Design is well planned. More details regarding what would be scheduled in the morning and afternoon workshops would be helpful. • There is no system in place to track trainee progress after program completion. The applicant does describe how they will go about creating such a system to track program trainees during and after their participation.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 13	• There appear to be well established programs and relationships in place to recruit an appropriate mix of program participants. • The cross-departmental collaboration is described by the applicant, and there appears to be institutional commitment to the success of the program. • The program would benefit from the rich history at the institution, including diverse and underrepresented students and helping them succeed. At this campus, more than 50% of the students are from underrepresented minority groups and/or socioeconomically challenged groups. • Strong history in promoting diversity. • The plan is to invite academic industry leaders, policymakers, IP attorneys, medical doctors, nurses, and entrepreneurs to speak during the program. Students also will be invited to speak. Patients and patient advocates will be invited to speak. • There are excellent training opportunities and special patient advocate events. • Patient outreach provided. • The program is achievable and practical. • A strength of this proposal is that the mentors are identified, though the amount of time that they will spend with trainees in not stated, so it is difficult to assess trainee access to their mentors. • Short program (5 weeks) - appears manageable. Time in research is not clear.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 12	• The applicant is one of the nation's most diverse campuses. There is also a strong dedication to building on this already strong history in promoting diversity, equity and inclusion. The institution has been a federally designated Hispanic Serving Institution for over 10 years. • Given the geographical location and the student body, it should have a great impact on underrepresented minority trainees. • The institution has never had one of these programs. But they have had similar programs and done well with them. • Excellent track record. • A tracking program is not in place - could use guidance from CIRM on necessary data to track for the program. • Tracking system is not well-developed. • Needs better tracking program.

No: 1	• This is a new program, so no such data exists. I encourage the applicant, if funded, to work closely with CIRM staff to address areas of deficiency or inexperience.

Application #	EDUC3-13123
Title (as written by the applicant)	Stem Cells & STEM Education - a Summer Internship Program for California High School Students
Public Abstract (as written by the applicant)	We propose a program that removes the barriers for disadvantaged California high school students to receive mentored, hands-on learning experiences in stem cell biology at a world-class research institute with an esteemed track-record of educating the next generation of scientists, including at the high school level and from under-represented minority (URM) and socioeconomically-challenged backgrounds. Access to out-of-classroom science enrichment experiences is severely limited for students from low-income and URM backgrounds. They typically experience a precipitous decline in interest in STEM (science, technology, education, math) careers for several reasons: a lack of self-confidence; little encouragement from their superiors or families; a dearth of role models; curricula that offer few hands-on activities. Conversely, entrance into STEM is highest in students who have participated in robust STEM learning experiences in primary or secondary school. When mentored research takes place within a structured peer-learning community, students develop heightened self-confidence and a deep sense of belonging that translates into lasting interest and engagement in STEM. To address these needs, our institute proposes a 5-year SPARK program that will fund 6-week internships for 57 URM students from low-income families. Our SPARK interns will work alongside our diverse, multidisciplinary community of scientists, trainees, and staff who are committed to conducting excellent, rigorous, cutting-edge studies targeting human disorders. Our institute's research enterprise – comprising biologists, chemists, engineers, and clinicians with extensive expertise in stem cell biology and allied disciplines – is dedicated to a mission well-articulated by CIRM: accelerating stem cell-based therapies to all patients of all backgrounds with unmet medical needs. Our SPARK program is fortunate in being able to avail itself and leverage the resources our institute already has in place for its innovative Graduate School (which is highly individualized and characterized by rapid immersion in research) as well as for our recently-funded CIRM EDUC4 Training Program which, itself, is a hub in the local educational network. In addition to benchwork, students will participate in a weekly didactic course facilitated by an expert in STEM education. Interns will learn to present their work to scientists, not just within our institute but also at regional science fairs. They will learn to educate lay people by speaking at science festivals and sitting on panels hosted by local high schools. To put a human face on the diseases they will be studying, interns will meet patients and their families. They will be exposed to multiple career options in the academic, private, and clinical sectors. By the end of their internship, students will not only develop a foundational knowledge of stem cells and their potential in medicine, but also gain a sense of the excitement of a STEM career, closing the gap to postsecondary success for a number of California youth.
Statement of Benefit to California (as written by the applicant)	Among California's greatest resources are (a) its Institutions which have impacted the world for generations in the fields of science, technology, education, and math (STEM), and (b) its young people. For a shamefully large percentage of California's youth, however, participating in California's leadership in STEM has been severely limited. These are the socio-economically disadvantaged students from under-represented minorities (URMs) and/or low-income regions. These students typically experience a precipitous decline in interest in STEM careers for several reasons: a lack of self-confidence; little encouragement from their superiors or families; a dearth of role models; curricula that offer few hands-on activities. Conversely, entrance into STEM is highest in students who have participated in robust STEM learning experiences in primary or secondary school. When mentored research takes place within a structured peer-learning community, students develop heightened self-confidence and a deep sense of belonging that translates into lasting interest and engagement in STEM. To address these needs, our institute – a research institute with a long track-record of excellence in targeting human disorders and a commitment to training the next generation of scientists of all backgrounds -- proposes a 5-year SPARK program that will fund 6-week internships for 57 URM students from low-income backgrounds. California will benefit from the SPARK trainees who complete our unique, intensive, multi-disciplinary, collaborative, internship program:

	1. Patients will benefit from improved therapies. Our program will enable interns to be more likely to pursue STEM careers, reinforcing, with even greater depth and diversity, California's pipeline of highly-skilled, rigorous stem cell and regenerative medicine scientists and clinicians, who will, in turn, 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. Increased revenue -- to the State and to companies in the State. Ultimately, these discoveries will be translated to the clinic and/or to the biotech and pharmaceutical sectors, resulting in licensing fees and royalties that will be a return on the State's investment, 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 to recruit – (a) to recruit exceptionally qualified young and/or "marquee" scientists to its universities and institutions: (b) ability to attract companies to the State because of the large pool of well-trained, qualified, and diverse scientists. Over time, the increased pool of talented and skilled trainees graduating from programs like SPARK will swell the ranks of scientists in California's biotechnology and/or pharmaceutical companies and in its health care facilities.
Funds Requested	$509,000
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All Grants Working Group (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	87
Median	85
Standard Deviation	3
Highest	92
Lowest	82
Count	15
(85-100): Exceptional merit and warrants funding, if funds are available	13
(1-84): Not recommended for funding	2

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	• Yes. This five year SPARK program seeks funding for a six week internship program, designed to expose 57 underrepresented minority (URM) high school students from low income and disadvantage backgrounds to human disorders. The institute has an outstanding track record in diverse multidisciplinary research. They plan to partner with an advocacy organization that is a

	statewide model for intersegmental, regional collaboration in math, engineering and science education. It's a perfect match. ● This program - which involves mentoring, exposure to diseases that encompass multiple organ systems, and bench research - will foster commitment among the trainees to continue in STEM studies and research. ● The program will recruit disadvantaged URM students who have little to no exposure to STEM. These participants may currently not be interested in STEM because they are not encouraged to pursue STEM, they have limited self-confidence, or they have absorbed personal insecurity from their families and peers. ● The training program is based on an established program that has provided training for ten cohorts of URM high school students. Tracking of former students has revealed that the program has been successful in its stated mission and likely to continue to have a positive impact on high school summer trainees. ● A list of the former trainees indicates that many ended up in graduate biomedical careers as well as in fields aligned with the mission of the SPARK program. It is clear that this program is indeed accelerating the CIRM mission. Patient engagement is well-documented and appears to be more than appropriate. ● This SPARK program has partnered with an advocacy organization that is a STEM program for disadvantaged and URM students. Trainee eligibility will focus on students that meet at least one of these criteria: URM group, low-income household, and/or neither parent holds a college degree. The two-tier selection process is conducted by the Program Directors and members of their partner advocacy organization. ● The program includes lectures from early-career URM scientists as role models. ● Yes, but I think the program overestimates the possible outcomes for a six week program. Can a six week program, run for five years, really lead to new and novel intellectual property, licenses and new industry relationships? As well as new jobs in California? Possibly, but the focus should be helping these kids succeed, get into college and have productive careers and jobs. That should be the measurable impact. ● This is a good program with updated recruitment efforts to increase the number of URM trainees. Their previous track record on recruitment of URM trainees is not good. ● The applicant specifically designates African Americans, Pacific Islanders, Latinos and Native Americans as selection targets. It is unclear why they do not mention other individuals of color. ● There is no mention of gender diversity, nor any mention of learning-challenged students nor students with disabilities.
No: 0	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 13	● Yes. The program complements bench research with formal and informal teaching - before and during the internship. This early exposure will stimulate interest in STEM fields while promoting critical thinking and higher-level engagement. ● Students will receive mentored, hands-on research experiences in stem cell biology at the institute in faculty labs. This exposure is combined with short courses on the fundamentals of stem cell biology. SPARK trainees will also learn about ethical and regulatory issues; disease modeling and drug discovery; clinical manifestations of disease (via bedside-to-bench tutorials and "grand rounds"- like sessions, enhancing patient engagement); and how to present and write science. ● This program will use CIRM's "Model Stem Cell Curriculum," and trainees will engage in collaborative learning activities. This learning strategy increases retention in STEM majors. ● The program has a good track record in patient engagement. The trainees will have opportunities to engage with patients directly. ● Trainees will also meet scientists whose research is relevant to their assigned topics in stem cell research. ● Mentorship is appropriate; the program provides both graduate student 'peer mentors' and faculty mentors.

No:
1
	● Mentorship is provided for this program, but I am concerned because the mentorship does not continue beyond the summer.
	  ● Specifically, there is no plan to help support these trainees get into a college or university;
	  ● No standardized testing preparation, tutoring, college and career planning, or financial aid assistance is provided;

	• Transitioning to college is a hard period for URM students and the program's support needs to continue.
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 14	• They have an excellent track record. The institution has impacted the world for generations in the field of STEM. They also have a long history of excellence in targeting human disorders and a commitment to training the next generation of scientists of all backgrounds. • This is an experienced team with significant (more than 10 years) training experience. They have all they need to implement the training program. • Letters of support are strong and indicate that the team has support not only from their institution but also from their local partners. The Program Director is well-qualified and experienced in running training programs. • Yes. The applicant has a solid track record and strong letters of support. • The personnel are well-qualified, as is the partner advocacy organization staff. • Yes; their recruitment is well spelled-out. They have planned appropriate trainee eligibility criteria, selection process, and trainee placement. • The program has mentors, researchers, partner high schools, and the resources to conduct the summer program. It lacks the resources for sustainability of impact beyond six weeks. • Enforcement plans for their request for financial information from trainee applicants are not clear.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 12	• Positive outcomes in the applicant's track record may reflect the recruitment process, which, in the past, has been biased against under-served and disadvantaged communities. • This is an established program; going forward they are making new efforts to recruit URM groups. Prior recruitment of underrepresented minorities was not satisfactory.
No: 2	• The track record and outcomes presented are suitable. Unfortunately, these types of programs do not achieve 100% follow-up after trainees complete the program. • The track record of recruiting URM trainees could be improved.

Application #	EDUC3-13168
Title (as written by the applicant)	Stem Cell and Regenerative Medicine - High School Summer Research Internship
Public Abstract (as written by the applicant)	The proposed research internship will strengthen the future of stem cell research in California by providing California high school students the exciting opportunity to experience hands-on research in various areas within stem cell biology and regenerative medicine. The internship aims to recruit a diverse group of participants from under-represented ethnicities and/or low socioeconomic backgrounds. Participating students will be mentored directly by graduate students, post-doctoral fellows, and faculty within various stem cell related research labs. During the first part of the research internship, there will be an overview of the program, review of biology basics, an introduction to the stem cell field, and a research bootcamp on lab skills and techniques. Students will also be taught foundational concepts of the stem cell field through the opportunity to attend a lecture series course in stem cell biology taught by graduate students. Additional lectures will be taught by faculty and will include learning practical skills such as how to read a journal article, write an abstract and design a research poster. Students will attend talks by speakers from diverse backgrounds who will also share their educational pathway and life story and will also hear talks about various public health issues and diseases that disproportionately affect under-represented communities to increase awareness. In addition, students will have the opportunity to attend special seminars regarding the college application process and graduate school/medical school educational paths by current undergraduate, MD professional and PhD graduate students to better prepare the trainees for the future. In addition, students will participate in some patient engagement and community service activities to enrich the internship experience. The student interns will have several opportunities to present their research projects including presentation at lab meetings as well as presentation of their research poster at an end of summer poster session which is open to the community. The goal of the internship is for the students to be well trained in essential laboratory techniques and to motivate them to reinforce their excitement for stem cell and regenerative medicine research in the future. Another goal is that the participating students will disseminate their excitement for stem cell and regenerative medicine to their families, classmates in high school, and local communities especially through the end of summer poster session. The discoveries that these students will contribute to in their labs will further help to promote stem cell research in California and throughout the world. The ultimate goal of our proposed summer internship program is to train a diverse group of students who will be the next generation of future regenerative medicine and stem cell scientists which is critically needed.
Statement of Benefit to California (as written by the applicant)	There is not only a great need to increase the pipeline of students entering the biomedical research field, but also a compelling need to promote ethnic and socioeconomic diversity in the biomedical and life science workforce. Providing California high school students an opportunity to participate in this new field of stem cell research will allow them to explore biomedical research as a possible career and to create a pipeline of future Californians to serve as regenerative medicine and stem cell biologists. Even before the Gold Rush, the State of California was considered a place to seek adventure and to make important discoveries. The regenerative medicine and stem cell field requires visionary leaders and organizations such as CIRM to fund them and to promote new ideas and discoveries. There is no better way to promote science, math and engineering education in California than by giving California students the opportunity to participate in hands-on research at the University level. These young trainees will benefit other Californians by making important discoveries that will improve the health of other Californians – and for that matter the whole world.
Funds Requested	$508,750
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All Grants Working Group (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	95
Lowest	75
Count	15
(85-100): Exceptional merit and warrants funding, if funds are available	13
(1-84): Not recommended for funding	2

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: 12	• The institute has a deep cadre of outstanding scientists and physicians working in stem cell biology and regenerative medicine. There is no doubt that trainees will have the opportunity to participate in laboratories doing significant stem cell research. The SPARK program has been tacked onto the longstanding, excellent summer research program at the institute. • Unfortunately, the application does not provide specifics on which of the institute's outstanding stem cell scientists will serve as mentors or whether they will interact directly with trainees. The stem cell group within the program will be led by two teaching assistants. These graduate students are not identified, even for the first year of the program. How are they chosen? Who will supervise them? • There also is no mention of a known stem cell scientist involved in the administration of the program. The Program Director, who founded the summer program 20 years ago, does not seem to have any direct involvement with stem cell research and is committing only 2% effort (at least with respect to salary) to the SPARK program. The absence of faculty-level leadership specific to the SPARK program is a major concern. • The program will have a long-lasting impact in training the next generation of scientists and physicians in regenerative medicine. • The calculated impact on under-represented communities is not well articulated with sufficient detail as to how the population of trainees meets diversity, equity, and inclusion (DEI) objectives. • The patient engagement activities could be stronger. Community outreach and engagement seems to be limited to presentations and discussions rather than more direct options – this is more didactic than interactive. • There are several activities listed that will familiarize trainees with current cell therapy treatments such as 1) a 'be the match' program; 2) roundtable discussions with donors and patients; 3) special faculty and clinician talks; 4) bone marrow registry drive; and 5) potential visit to the apheresis center at the institute. • It is encouraged that trainees become familiar with current unmet medical needs; this could be accomplished in the talks given by faculty and clinicians. • Historically this training program has been committed to train students from socio-economically challenged and under-represented minority communities. The applicant proposes to increase the percentage of trainees from these groups in the program. • The institute has a state-of-the-art collection of stem cell laboratories. • A major strength is the excellence of the institute in stem cell science.

	• Because of the science and scientists at the institute, this program will have great impact. However, the application lacks detail. • Yes. However, the applicant's long track record of success may have resulted in their submission of a proposal that lacks specificity in key areas. • It is disappointing that the proposal was not written in a more competitive way, e.g., with a better description of potential mentors.
No: 1	*none*
GWG Votes	**Is the program well planned and designed?**
Yes: 9	• The program provides good educational training including stem cell biology, talks on careers and healthcare disparities, and preparation for college admissions. • The program is well organized. A Teaching Assistant (TA) or a postdoctoral fellow will be responsible for tailoring a curriculum for the trainees. Trainees will be mentored by them and supervised daily. Mentors will be given a stipend for their work. • The program is well organized. Trainees are given the opportunity to select three different laboratories and are placed in one of the three by the program administrators. • More details of specific mentorship opportunities, and more evidence of faculty engagement, would be helpful. • Overall, the mentoring and supervision of trainees appears inconsistent and poorly monitored; some may have minimal interaction with their lab head. This may particularly hurt students entering the program from disadvantaged backgrounds. • It is unclear how much of the trainees' activity will be in stem cell research given the medical disciplines described in the proposal. • Auxiliary educational activities are well thought out. They include orientation and training lectures including basic research bootcamp, stem cell lectures, social events, and a poster session. • Key details are missing from the stem cell-focused component of the auxiliary educational activities. Who will provide the lectures? How many will be given? Will trainees' participation and learning be monitored? • The applicant plans a symposium in the final week of the program, but no specific faculty members or topics are named. • The tracking system is adequate but not outstanding. • I am concerned about the limited patient engagement. • The Program Director might be over-committed. • Outreach plans are not well-defined.
No: 4	• The program offers a fine quality of labs for trainees to participate in, but the trainees' level of involvement in the research is not clear. • Graduate students and postdoctoral fellows serve as daily mentors. • The program offers little exposure to clinical medicine, especially clinical medicine at the cutting edge. • The plans for auxiliary education are poorly defined and missing details. • There were few details in the application.
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 13	• The institute has 23 years of experience running their summer research program; it has trained 900 students; of those, 87 trainees have been trained specifically in stem cell research sponsored by CIRM. • While there are likely to be fantastic opportunities, a description of these is missing along with information about engaged faculty mentors. • The lab resources and quality of research programs are known to be outstanding, although this is not documented in the application. • Excellent program that is achievable and practical. • The named leadership for the SPARK program does not include someone with significant experience or a broad perspective in stem cell research and regenerative medicine. This is a major weakness. • The program has an experienced Program Director, supported by a finance specialist and a program manager. • The limited amount of allocated time for trainee recruitment and management of the program seems unrealistic.

	• The Program Director has just a 2% time commitment to the program. The program is run by two Teaching Assistant graduate students who will match trainees to faculty - this is a significant weakness. • The training program is achievable. Pairing each trainee with a mentor that will supervise them daily gives credit to the notion that all proposed goals will be executed as stated. • Patient interactions are not well defined. • The program has attracted trainees from low socioeconomic backgrounds. Their previous CIRM programs' enrollment have been somewhat diverse; the distribution roughly reflects the catchment area. The application includes plans for improvement of DEI. • The SPARK program is advertised widely - to 100 high schools - and targets schools in localities with socioeconomic challenges. The program also partners with a summer program for low-income students to increase diversity in the pool of applicants. • Applicants are scored in five areas: academic background, science interest, character, motivation, and leadership. • If past performance can be used to predict the number of future applicants, it is worth considering that over the last 5 years, this program had in average 1019 applicants per year; 50 to 60 were admitted.
No: 0	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 12	• Certainly, the college admission rates reported are impressive. It is difficult to assess the extent to which the pool of trainees selected influences this outcome - would these trainees have attended college and pursued STEM fields had they not participated in the program? • The track record of the institute summer program shows that trainees do very well in gaining admission to first-rate universities, and that a high percentage remain engaged in STEM. This includes trainees in CIRM-funded programs. • The application claims that a very high fraction of the trainees come from diverse cultural and socio-economically challenged backgrounds. Anecdotal stories from a few trainees support this, and several members of the Grants Working Group (GWG) stated that it is consistent with their own first-hand knowledge. However, supporting data in the body of the application is thin. • Excellent outcomes for trainees: entry into top universities, and many progress to graduate school. • The track record is outstanding.
No: 1	• This is a 20+ year program but tracking data on trainees from under-represented groups are missing. A definition for these groups was not specified. Including this data will strengthen the application.

Application #	EDUC3-13153
Title (as written by the applicant)	Internship at a Cutting Edge CIRM-funded Stem Cell Research Facility
Public Abstract (as written by the applicant)	The CIRM Accelerate Regenerative Medicine Knowledge (SPARK) Program is a motivating, stimulating, and rewarding experience encouraging young people from the State of California to enter the field of stem cell biology and research. This has been proven in our Stem Cell Program by ten years of summer internships, starting with a pilot program conducted with four high school students in the summer of 2011 and then expanded to ten students at our institute for four additional years and re-funded for another five years, allowing highly motivated and talented students from regional high schools a unique opportunity to develop skills in stem cell biology and research. This opportunity will be available again through the new CIRM SPARK internship program. At our institute, as previously, participants are selected from the winners of a competitive award program wherein high school students are asked to design web articles with added creative media components, in the field of biotechnology. Through the competition, students gain skills in research and creative scientific writing, while achieving recognition from peers, educators, and members of the biotechnology community. This challenge attracts a pool of students from regional high schools who are highly motivated and is targeted toward high schools with high levels of diversity. Ten winners of the challenge are chosen for an internship in our stem cell program. Guided by a mentor that most closely matches the trainees' interests, they intern in one of our laboratories involved in developing novel stem cell treatments for diseases that affect the heart, brain, liver, kidney, bladder, bone, skin, eye, and other organs. Our state-of-the-art Good Manufacturing Practice (GMP) Facility is an important part of this internship, which is a highly unique opportunity, as this facility manufactures stem cells for clinical applications. Students will participate in a theoretical and practical class in stem cell biology and manufacturing practices, earn a certificate of GMP training, and will experience clinical activities in our medical school's student-run clinics. The activities in the clinics will expose the trainees to the needs of medically under-served communities and will allow them to contemplate the application of stem cell treatments in diseases not treatable by conventional medicine. The interns will prepare and present, in front of their peers and CIRM officers, a poster or oral presentation about their project. This internship program will benefit the State of California greatly. Excellent researchers and highly skilled biotechnology laboratory personnel will be needed in the near and extended future to produce stem cell treatments in California, which are already being moved into the clinic by CIRM-funded stem cell research laboratories. These young people are the future of California's health and economy.
Statement of Benefit to California (as written by the applicant)	The CIRM Creativity Program, followed by the SPARK program, has provided ten years of summer internships at our institute for high school students from diverse backgrounds throughout Northern California. The summer spent at a cutting-edge stem cell research facility was not only a highly educational experience for the trainees, but also helped them shape their intentions for a future career in science, particularly biological science, and stem cell research in the State of California. Our previous experience with this internship and the new SPARK program planned for the coming years, highlight the following areas of benefit to the State of California: Highly motivated and talented students are chosen from a large pool of applicants who may become California's future leaders in biotechnology and stem cell biology. The applicants are selected through our institute's Teen Biotech Challenge Program, which is already benefiting the state, as it develops many students' interest in a career in biotechnology. High school students write scientific web articles with associated media content about the field of biotechnology, and the merits of these articles are judged by faculty members and biotechnology leaders in the field. This program attracts a pool of students from Northern California high schools who are interested in biotechnology and are deeply motivated; additionally, it is specifically targeted toward high schools with high levels of diversity. For the SPARK internship program, ten of the best students from the challenge are selected. Selection criteria are based on their specific field of interest, the quality of their work, and their motivation. The success of our ten previous summer internships proves that this method of selection provides a student pool that is diverse, profoundly motivated, and well qualified, with a great chance of succeeding in the summer program and also later in their careers. Ethnic diversity of the selected trainees is another factor considered during selection, appropriately reflecting the ethnic composition of the state of California. Interested and motivated high school students are of

	highly diverse backgrounds and may also be of under-served status; they are shown a career path that may not have been available to them otherwise and are often the first in their family to attend college, aided by their experience in the internship and our assistance with applying for awards and scholarships. A pool of excellent researchers and highly skilled biotechnology laboratory personnel will be needed in the near and extended future to manufacture stem cell treatments in the state of California; these treatments are currently being developed and moved into the clinic by CIRM-funded stem cell research laboratories. These young people are the future of California's health and economy and present the best possible investment for our state.
Funds Requested	$508,750
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All Grants Working Group (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	95
Lowest	80
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: 13	• The applicant has ten years of experience hosting this summer internship program. • This program provides excellent access to stem cell labs and science training and excellent peer mentor training. The institute has 40 years of experience operating student-run clinics in adjacent inner-city neighborhoods - providing free health care to uninsured, low-income, and other under-served populations. • The program has the potential to enrich opportunities for economically disadvantaged students. • This is a great program with a big flaw in the selection process. Their track record of 12% under-represented minority trainees is not good enough. They must change the application process to increase the percent of under-represented minority trainees.
No: 0	*none*

GWG Votes	Is the program well planned and designed?
Yes: 13	• All the necessary components are in place, with the exception of a more inclusive recruiting process. Perhaps the preparation techniques used by the most successful high schools in the area can be shared widely among local high schools, and thereby promote inclusion of a more diverse SPARK trainee applicant pool. • Other than the recruitment process, the program is excellent. Recruitment is biased against under-represented and socioeconomically disadvantaged high school students, the intended beneficiaries of the CIRM SPARK program. • The program provides a strong environment for exposure to stem cell science. • Excellent program; well designed.
No: 0	*none*
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 12	• Yes. The program has been running for about ten years and has all the elements in place to continue successfully training high school students. • Yes. The applicant describes a logical extension of a successful program from the past ten years. • The applicant has reached out to several local high schools to recruit students from socio-economically challenged backgrounds. • Ethnic diversity and special emphasis on a socio-economically challenged background of the selected students are factors considered during selection. The applicants are advertising a new informational Zoom webinar for teachers, students, and parents. • 12% or fewer trainees are from under-represented minority groups; this is low and is not in line with mission of this funding initiative. • The issue of limited diversity in the program is not addressed or acknowledged.
No: 1	• The program's recruitment process going forward is unclear.
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 12	• The program has tracked 80% of its alumni. Nearly all attend college in biotechnology-related fields. The applicant does not provide a plan to improve retention of alumni in their tracking. • 73% of past trainees have matriculated to college, 71% graduated college, and nearly all are pursuing careers in science. • Some alumni return to the institute as teaching assistants during the summer.
No: 1	• The table of former trainees shows a lack of diversity. The trainees do not represent the proportions of ethnic minorities in the state. This is partly due to the selection process. Applicants should be able to provide demographic information – i.e., they should be given a checklist to select under-represented minority or financially disadvantaged status. Having had only 12 under-represented minority trainees is a poor track record in my opinion. Do students from more technologically advanced schools have a better chance of being selected?

Application #	EDUC3-13129
Title (as written by the applicant)	Exposing Students to Regenerative Medicine (ExStRM)
Public Abstract (as written by the applicant)	Although there has been an increase in the research training opportunities available to high school students, there is still a need to equip youth with the scientific skill set to critically understand, explore, and engage with the community, and to motivate under-represented minority students to become interested in a research career. Aligned with the overarching goal of CIRM, our program is designed to immerse trainees in an eight-week exposure to concepts and experiences that will spark interest and an understanding of regenerative medicine and its impact on communities in our region. To provide a comprehensive and enriching experience, our program provides trainees with workshops and other extracurricular activities within the institute's existing high school summer program. The Program Director, Co-Director and Program Coordinator also serve as leaders for the institute's existing high school summer program. They have experience and history working together collaboratively to implement innovative programs to provide hands-on research training and education to students from under-represented minority groups. Students in the program will conduct research under the mentorship and supervision of renowned research faculty with expertise in regenerative medicine research using the latest and innovative stem cell techniques. Trainees will participate in patient and healthcare engagement activities such as blood and bone marrow donor drives, and community outreach activities to share their research experience using social media outlets such as blogs. In addition, trainees will participate in workshops and seminars that will provide them with the fundamentals in conducting regenerative medicine and presenting their research projects. The program's overarching goal is to increase the number of under-represented minority students (under-represented minority) prepared to pursue careers in regenerative medicine which will improve unmet medical needs. The Specific Aims are as follows: Aim 1: Provide mentored support and leverage regenerative medicine research resources of existing research training programs at the host institute to propel under-represented minority high school students in their trajectory as regenerative medicine research scientists. Aim 2: Engage trainees in community outreach and patient engagement activities which will enhance their understanding of regenerative medicine. Aim 3: Implement an evaluation and monitoring plan to continually assess and improve the effectiveness of the program, emphasizing: i) recruitment and retention of promising under-represented minority high school students to graduate from high school and major in a science related degree with the goal of pursuing graduate studies in stem cell or regenerative medicine, ii) trainee-led dissemination of community-driven scientific results.
Statement of Benefit to California (as written by the applicant)	This proposed program will benefit the State of California and its citizens by increasing their understanding and knowledge of the importance of regenerative medicine. This program will also aid in developing a diverse biomedical workforce with highly developed quantitative, analytical, and problem-solving skills who are well trained and knowledgeable concerning health disparities in regenerative medicine in their California communities. This program will further the educational and scientific careers of high school students from backgrounds under-represented in the sciences. It will both diversify and build the science workforce in California as well as increase the knowledge of regenerative medicine and stem cell research. Diversifying the scientific field is of critical importance to the state of California because a more diverse biomedical workforce has been repeatedly cited as a mechanism for addressing disparities in health and healthcare and there are shortages of under-represented individuals in the science workforce in California. Exposing California high school students to this new field of regenerative medicine and stem cell research will allow them to explore biomedical research as a possible career, and to create a pipeline of future Californians to serve as stem cell biologists, genetic therapy, or regenerative medicine researchers.
Funds Requested	$499,500
GWG Recommendation	(85-100): Exceptional merit and warrants funding, if funds are available
Process Vote	All Grants Working Group (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	85
Median	85
Standard Deviation	7
Highest	95
Lowest	74
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: 12	• Yes. The program is likely to foster commitment among trainees to accelerate stem cell-based therapies to patients with unmet needs by providing them with experiences to serve the communities of their origins. The trainees will engage with patients, become trained in appropriate methods of conducting research, and participate in community outreach. These experiences will provide comprehensive experiences that will expose the trainees to careers in biomedicine. • Yes. The institute serves a majority under-represented population including African Americans and LatinX students. The high school students in the community are also ethnically diverse, and largely under-represented in sciences and socio-economically challenged. • The institute is uniquely designated as an Historically Black and Historically Hispanic serving institute. • Yes, but this program currently does not have enough mentors. • It is difficult to determine from the application if trainees will have a positive experience regarding stem cell research. • There are few details in the proposal discussing what will occur when the trainees are in the program. • It is stated that trainees will learn about various diseases, but no details are provided on how.
No: 2	• The stem cell expertise among the mentor group is not clear. • This is a unique institute that serves under-represented minorities and has potential for great impact, but at present there is no track record to determine the program's potential.
GWG Votes	**Is the program well planned and designed?**
Yes: 7	• Yes. The program details a summer experience for trainees in regenerative medicine and provides opportunities for trainees to do community outreach. • The application is strong in the sections for diversity, benefit to California, auxiliary education, and patient engagement activities. The application is weaker regarding actual stem cell research training. The goals, as stated in the application, are laudable - but the applicant should describe the research mentors and fields of research. • How many trainees could be placed in stem cell research labs and mentored? Perhaps it would be best to start the program with a few trainees in the first summer, develop a strong research and

	mentoring program, and expand to more trainees in two to five years. If possible, the applicant should engage with current SPARK trainee institutes to discuss best practices. ● The program is well-planned. The schedule of activities is excellent. However, integration of more stem cell and regenerative medicine expertise is needed. ● The stem cell research component could be better described.
No: 7	● The applicant has listed five mentors, but one is a post-doctoral fellow and one is an adjunct professor. The program needs to have dedicated mentors with established academic success as role models for the trainees. ● It is unclear if there are enough mentors with stem cell or gene therapy expertise. ● The applicant has not yet chosen the local high schools where they will recruit trainees but plans to search school web sites to find high schools with high usage of free lunch. There is no description of contingency plans if a school does not have a web site or that information is not available on the site. ● This program could be impactful.
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 11	● Yes. The program has an experienced director with many years of experience providing summer program opportunities for high school students. ● A ten-week program is practical. Mentorship can be achieved if each mentor trains two students, or if more mentors are recruited. ● The major question is: how many trainees can be placed in stem cell research labs and mentored effectively?
No: 3	● The application provides insufficient information on what the trainees will accomplish during their summer experience. ● The major issue is that the program will enroll ten trainees but only five mentors have been identified to date. ● The application does not include a description of how trainees will be matched with mentors. ● Ten trainees per year may be over-ambitious for this program. The maximum number of summer trainees the institute has had in any one year over the past decade is ten. ● It is unclear if the requested SPARK grant would fund ten more trainees per summer, or if the applicant is requesting funding for the current ten trainees per summer.
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 11	● The larger program has an excellent track record. Apparently, this is the applicant's first time applying for SPARK funding. ● The institute has a similar program in place that is not focused on regenerative medicine. ● This application would benefit from the following actions: 1) define the precise educational activities including an introduction to bench research, introduction to clinical trials, introduction to stem cells, lab safety; 2) identify mentors with published research and funding in stem cell or gene therapy; and 3) put a tracking method and support system in place for alumni of the program. ● Using the platform of the institute's existing high school mentoring program, this program could be nurtured to achieve the desired goals of the SPARK funding initiative. ● The institute's ongoing summer program has an excellent track record of matriculation to college: 99% of 90 trainees over the past ten years.
No: 3	● Because this is a new program with few mentors, I recommend that CIRM fund five student slots.

Application #	EDUC3-13247
Title (as written by the applicant)	High School Summer Fellows in Biomedical Research
Public Abstract (as written by the applicant)	At our institution, we are committed to the education and training of the next generation of leaders in science, research, entrepreneurship, and beyond. It is our ongoing mission to bring cutting edge educational experiences to all students, of all races, ethnicities, gender or socio-economic status. Our institution is a leading non-profit biomedical research institute responsible for carrying out hundreds of research projects conducted by over 100 clinicians and research scientists. While its discoveries have undeniably benefitted tens of millions of individuals worldwide, the target population remains the ethnically diverse, low-income children and adults, numbering approximately two million within the area served. The High School Summer Fellows Program, into which the CIRM High School Summer Fellows in Biomedical Research will be incorporated, is designed to provide an environment, through direct exposure in a two month-experience in a research lab and virtual curriculum, to consider careers in the field of biomedical science. During the course of the summer period, trainees will partner with other high school, undergraduate, and graduate students, as they explore the area of stem-cell research and its translation to clinical application, better known as "bench to bedside", as well as the field's overall potential impact on biomedical innovation. Successful high school applicants will participate in a cutting-edge curriculum consisting of over 30 lectures given by world-renowned investigators, in-depth focus group assignments and special seminars. These stem-cell focused research projects will be conducted in laboratories on our campus, as well as other nearby institutions. At the end of the summer period, all students participate in a culmination ceremony, consisting of project poster presentations, as well as the presentation of focus group summaries, to peers, family, and the research community. The institution's President and CEO, as well as other local dignitaries, preside at the event. Certificates of Achievement will be provided, and potentially letters of recommendation from our investigators to further their further pursuits in research and/or medicine.
Statement of Benefit to California (as written by the applicant)	With the institution's goal of educating the non-scientific general public on the clinical applications of stem cell research and its benefits, including the ethical, legal and social issues involved, our proposal advances the central mission of CIRM. As personal beliefs on Stem Cell research are highly variable, many of these are based on incomplete and often inaccurate information. In an effort to continue to educate and broaden awareness, we would welcome the opportunity to continue to develop a program with a Stem Cell focus under SPARK. A CIRM SPARK Award here would allow us to provide a unique and focused opportunity for California high school students in the area of stem cell research and its application as a therapeutic in combating disease, leading to improving the health of Californians. The program aims to provide an opportunity for basic understanding of stem cell research, acquiring “hands-on” laboratory techniques as students undertake a mentor- based research project. It is envisioned that the training received through this program will kindle interest in young students, enhance awareness of stem cell-based biomedical research efforts and provide a new perspective on the development of therapeutic treatment. The ultimate goal of the program is to inspire, educate and motivate high school students in laying the foundation for potential future leaders in use of stem cells for translational studies in stem cell regenerative medicine. Our diverse community constituents include Latinos, African-Americans, as well as a large Pacific-Islander community with whom we closely partner, along with other underrepresented populations. In the area of science and education, early exposure is key and critical to sparking potential interest in the field, and therefore creating the possibility of forging future aligned career pathways. As we are uniquely positioned in one of the most ethnically diverse areas of our local community, our community partners and constituents would enthusiastically support the Institute's efforts in this arena. We regularly have a high number of inquiries and interest in internship opportunities here at the Institute; far more than we , as a non-profit, are able to support. Additional resources garnered for the purpose of supporting students, designing and implementing programs to benefit their educational exposure and experience, would be welcomed.
Funds Requested	$508,750

GWG Recommendation	(1-84): Not recommended for funding
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: 80

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	77
Median	80
Standard Deviation	5
Highest	85
Lowest	65
Count	15
(85-100): Exceptional merit and warrants funding, if funds are available	1
(1-84): Not recommended for funding	14

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: 8	• This could be a great program as there are excellent scientific opportunities. • This institution has a long track record on outreach. • An existing 45 year program of mentoring high school students shows that a majority who go to college will undertake science majors. • Could be improved by enhancing DEI recruitment efforts. • Eight week exposure to research in this program would have impact on the interns, but it is unclear that any more value regarding stem cells would be gained. • It has the necessary potential, but past records don't enable us to see how close they are to the potential being realized. Past records are sparse, and recruitment does not appear to be particularly underrepresented minority (URM) focused.
No: 5	• Not quite responsive to the CIRM mission.
GWG Votes	**Is the program well planned and designed?**
Yes: 6	• In scientific respects, this is mostly yes. There are many excellent scientists, and this would be part of a larger program. • Strengths include: a variety of exposures to scientific areas, variety of training methods, good basic introductory coursework on lab safety. • Weaknesses include: patient health care engagement is not well defined, URM seems underwhelming and outreach to another local institution is not well-defined but holds great potential, tracking is not robust.

	• The poor information on past performance, the lack of specificity on how to improve URM recruitment and similar matters undermine the application. • There is very minimal patient engagement. • The program is OK but not great.
No: 7	• Even though the program has been going on for years, there is little detail on the actual program. • The recruitment process is vague and the criteria for selection is also undefined. • The applicant should more clearly describe partnerships with other institutions.
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 8	• Yes, achievable but can be improved. • The institution can clearly run a science program. • The past experience with summer fellows program show it would work, however, it is unclear how the mission of CIRM will be incorporated. • Application could be strengthened if URM and disadvantaged students, first time college students were recruited more intensively to meet the goals of the CIRM program. • It is important to address URM; partnership with a local institution would be very strong here. • The applicant has didactic programs that are established but their specifics are missing. The application could be strengthened with more details of the didactics. • Application could be strengthened if the method of participant selection is defined.
No: 5	*none*
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 8	• Yes, but can be improved. • Need to strengthen track record because it is not clear what the impact of this program is overall. • There is little follow-up with little information on the former interns. The data given has only 3/14 from 2017, 6/22 from 2018 and 0/12 from 2019. • Representation of the URM in the selected interns did not reflect the applicant pool. • The data pre-pandemic is limited but only 19% were first-generation college bound.
No: 5	• Not optimal track record keeping. • This is hard to tell because past information is deficient.

Application #	EDUC3-13236
Title (as written by the applicant)	Stem Cell Summer Academy for High School Students
Public Abstract (as written by the applicant)	The Stem Cell Academy will include six participants who have a specific interest in stem cell research and regenerative medicine. The program creates a dynamic and stimulating educational and research environment and inspires its participants to choose STEM careers. It consists of an enriched summer research experience, a mentorship with research faculty and scientists, and coursework to establish a framework for understanding the scientific and ethical complexities of stem cell and biomedical research. The objectives of the program parallel the CIRM goals articulated in the solicitation. We seek to: (1) increase the scientific knowledge of interns; (2) increase scientific communication skills of interns; (3) teach them to think critically about the theory and application of biomedical research; and (4) encourage a diverse population of students to pursue careers in STEM fields. More than fifteen faculty members, with stem cell, regenerative medicine, or developmental biology research programs, have agreed to host these interns in their lab. By providing this experience we hope to create a feeder pipeline and encourage talented students to pursue careers in stem cell research. However, those who do not become researchers will benefit by applying learned perspectives and honed professional skills to their future educational endeavors and societal responsibilities.
Statement of Benefit to California (as written by the applicant)	To compete in today's global, high-tech economy, the United States is becoming more dependent on workers and leaders prepared in STEM fields; however, national studies indicate that too few American students have the requisite knowledge and skills in science and mathematics to participate fully in today's economy. We are falling behind in the global race for scientific human capital development. Since the turn of the century, China has experienced a revolution in education. It has outstripped both the US and Europe in the number of STEM graduates. The US is now third place in the number of STEM graduates in 2016, and the gap behind India and China is widening. The COVID-19 pandemic is only exacerbating this issue and the inequities in our education system. The institution has a history of training diverse students and scientific investigators, and therefore, is in a unique position to develop and implement programs that increase student curiosity and fill the achievement gap. The faculty and administration have worked collaboratively to develop a top-notch, intellectually focused educational experiences for high school students. By leveraging existing relationships, and our deep connection to the local minority community and the national scientific community, our institute is a unique place for developing and educating students for the STEM fields and helping the US regain its competitiveness.
Funds Requested	$304,790
GWG Recommendation	(1-84): Not recommended for funding
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: 75

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	74
Median	75
Standard Deviation	4
Highest	80
Lowest	70
Count	15

(85-100): Exceptional merit and warrants funding, if funds are available	0
(1-84): Not recommended for funding	15

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: 7	• Good research opportunities. • There is impact on science and scientific careers but not as high on stem cell focus. • Engagement activities could be stronger. Focus on health disparities is good but plans for patient engagement are not clear, mostly didactic experience rather than direct contact. Plans for engagement are somewhat indirect compared to some other applications. • Can be improved.
No: 7	• Stem cell program seems subsumed within the overall Summer Intern Program, including participation in a final oral presentation at a Summer Intern Symposium. Overall, seems to be a strong program in learning about the scientific method, critical analysis, engaging in scientific discourse, reading literature. • The application does not provide clear evidence of an orientation to foster a commitment to the CIRM Mission. Participation in the stem cell seminar series could be valuable in raising awareness of stem cell research. This is stated to be part of the "Stem Cell Academy" - but it is not clear if this is more than a single day event, and overall impact may be minimal. • Application gives information on 5 potential mentors who claim some level of direct research interest in stem cells, and one more who clearly is a chemist. However, it is not clear that there is a critical mass of faculty involved in the Stem Cell Academy to mentor all potential trainees and provide supportive educational activities focused in the field of CIRM's interest. • Need more information on the mentors, their ability to mentor, and their qualifications. Continued contact is important. • There is no mention of continued intervention with the students, no college support etc. • Leaders are not active in the stem cell research field, no evidence for real patient engagement activities. • Could have impact if they improve their patient and community outreach. Hold science fairs and patient advocacy events with the students and patients (end stakeholders). • Does not seem to be a good fit for SPARK. • CIRM mission not met.
GWG Votes	**Is the program well planned and designed?**
Yes: 4	• Established program.
No: 10	• Good list of mentor laboratories with fairly diverse opportunities across the stem cell field. • Few stem cell relevant laboratory experiences. • Seems to be a more general summer program rather than a CIRM effort. • The Stem Cell Academy is not well defined, too much focus on "boot camps" with little personal interaction. • There is little in the application to indicate that either the laboratory experience or other educational activities will have a strong focus on stem/progenitor cell lab research, translation or therapy development. While some trainees may indeed get such an experience, neither the list of mentors nor auxiliary educational activities indicate that it will be generally available or that there will be much sharing of experience among the CIRM-funded trainees. • Diversity, Program Enrollment, and Community Engagement plans were not well developed. • Light on mentors, no community engagement with in-person interactions, and continued mentor/student planning.

	• Outcomes are vague, outreach is vague, and little direct patient engagement. A lot of focus and details on Boot Camp, perhaps too much granular detail and not enough info around the larger picture of executing to achieve and improve success for these students. • The Patient Engagement Activities are generic to issues of biomedical research in a diverse society, but do not seem to engage issues around stem cells or regenerative medicine. There seems no direct engagement with caregivers or patients that is specifically relevant to the CIRM Mission. • Auxiliary training is satisfactory but could be stronger, other applications go beyond a bootcamp experience. • The program leadership, as described, does not include anyone with stem cell or regenerative medicine expertise. • The program director appears to have more duties and responsibilities than 3% effort.
GWG Votes	**Is the program proposal practical and achievable?**
Yes: 11	• Opportunity with 15 faculty in diverse areas of science related to stem cell research. • Previous known success. • Program Director has extensive experience in implementing engagement of underserved groups in STEM. • One key personnel slot devoted solely to recruitment, which should help with outreach to local high schools. • Independent assessor appointed to track outcomes. Graduate school has mechanisms for following alumni. • Yes, achievable but no resources and or thought into how to sustain these students into college and beyond.
No: 3	• Potential mentors are not clearly defined. • Few mentors are in the stem cell field. • The involvement of established leaders in stem cell biology or regenerative medicine, or sufficient mentors with a strong focus on these fields in the program is not well documented. • There is no direct connection reported to a medical facility, or access to patients/caregivers who need stem cell/regenerative medicine therapies. • The application describes a workshop on public health issues, health disparities, and related topics, along with "team science and community-engaged research." They also will participate in an event in which they "interact with community stakeholders who are directly impacted by research or who impact its funding," taking place at a stem cell seminar series. While worthwhile, it is hard to link these events directly to the impact of stem cell biology or regenerative medicine. • Weekly seminars and professional development workshops appear oriented to the overall summer program with no particular focus on stem cells/regenerative medicine. • Nothing in the Auxiliary Educational Activities or Community Education/Social Media Activities described in the application indicates that there is a specific plan to support goals of the program specific to the CIRM Mission. • Unrealistic low reimbursement for program director.
GWG Votes	**Has the track record and outcomes of a prior training program demonstrated success?**
Yes: 8	• High school trainees funded by CIRM were in the summer program at the institution previously. The table provided indicates all went on to college, many to highly ranked institutions. Overall, college placement for summer trainees seems excellent. No additional follow-up is provided. Tracking of future career progression and involvement in STEM activities would be advisable. • Prior CIRM-funded high school students have done very well with university placements. • The summer program does have a track record of attracting relatively diverse participants; in 2021 1/3 of participants were African American, Hispanic/Latin, Native Hawaiian or American Indian. In 2020 they created a Diversity Advisory Committee led by the program director of the proposed SPARK program. There is a promise to strengthen recruitment and engagement of trainees from diverse ethnic and economic backgrounds, but specifics are lacking.
No: 6	• Previously funded CIRM program has not been renewed, no tracking and additional follow up. • There is no real track record. They look at surveys and tracking with a database. • Tracking is less optimal. • Not represented consistently. • Diversity committee has not defined a specific program. • Could be more inclusive of minority trainees.