



MEMORANDUM

Date: January 21, 2009

From: Alan Trounson, PhD
CIRM President

To: Independent Citizen's Oversight Committee

Subject: Extraordinary Petition for Application TG2-01167

Enclosed is a letter from Dr. Prue Talbot, of the University of California Riverside, an applicant for funding under RFA 08-03, CIRM Research Training Program II. This letter was received at CIRM at least five working days prior to the January ICOC meeting, and we are forwarding it pursuant to the ICOC Policy Governing Extraordinary Petitions for ICOC Consideration of Applications for Funding.

As required by that policy, I have reviewed the petition (referencing reviewer comments and the submitted application as necessary) in consultation with Dr. Csete and the scientific staff, and concluded that the petition does not present compelling evidence that should alter the recommendation or score of the Grants Working Group (GWG).

We appreciate the arguments presented by Dr. Talbot on strengths of this proposal. Reviewers agreed that the institution's designation as a Hispanic Serving Institution provides an important opportunity for the recruitment and training of underrepresented minorities and this point was highlighted and accounted for in the score and final recommendation. However, this important strength was balanced by the reviewers' assessment of the overall quality and design of the training program. When compared to other competing proposals, this application did not convince reviewers that the training opportunities would provide sufficient depth and breath to trainees. It is also important to note that the existing training of students in stem cell biology referenced in the letter was not articulated in the application despite the opportunity to do so.

The applicant's letter also indicates that their application for the Training Grant Program in 2005 received a higher score and recommendation than for this review. We believe that there are many factors that might contribute to this difference including among others a general strengthening of competing programs in the last 3 years, a different composition of reviewers, and a different (although similar) proposal from the applicant. Reviewers based their recommendation on the proposal that was presented to them for the current competition and not the previous.

CIRM staff will be prepared to provide further analysis, should that be requested by any member of the committee.



Redactions, if any, have been made pursuant to the policy, in consultation with the author(s) of the letter. An unredacted version will be available for review in closed session.

The enclosed letter represents the views of its author(s). CIRM assumes no responsibility for its accuracy.

In addition, a copy of the CIRM Review Summary for this application is provided for reference.

1-22-2009

Dear ICOC Committee Members:

I am writing in regard to our CIRM Training Grant application # TG2-01167- (Training Program in Stem Cell Biology – a Multidisciplinary Approach at University of California Riverside) and wish to bring two issues to your attention. First, I ask the committee to consider our proposal for funding based on programmatic reasons; we have an exceptional and historic track record of serving under-represented minority students in the state, we are the most research intensive university in the US to be designated as a Hispanic Serving Institution by the Federal Department of Education, and we will offer an excellent opportunity for bringing these communities into high quality stem cell and interdisciplinary research. Second, I ask your help in explaining the reviewers' comments and the unexpectedly low score they gave to this proposal as compared to their review of the prior training grant proposal we submitted to the Grants Working Group in 2004 which was evaluated as 'highly meritorious and recommended for funding' (T3-00005 Integrative Training in Stem Cell Biology at UCR).

CIRM places high value on educating diverse members of our society and thereby "empowering all Californians to contribute their ideas and insights to increase chances for success and to ensure that all Californians can benefit from stem cell research". Our campus, which has the most diverse student body in the UC system with more than 25% Hispanic students thus qualifying for designation as an Hispanic Serving Institution by the Federal Department of Education, can play a key role in helping CIRM achieve this goal by assuring that training in stem cell biology reaches underrepresented minorities and women. We have 19,401 students (including 2,214 graduate students) of whom about half are women and a full third are under-represented minorities (African-American, Hispanic, and Native American). We were ranked 3rd nationally in ethnic diversity by U.S News and World Report (2007) and have a long and consistently strong record of recruiting, retaining and graduating minority students and women. For our current GAANN Training Grant in Chemical Engineering (Dr. V. Rodgers PI), 75% of the Trainees are from underrepresented minorities and 50% are women. Our graduate programs typically have significant numbers of minority students and women (e.g. Cell, Molecular and Developmental Biology has 29% minority students and 50% women). We provide education to a rapidly growing and under-served region of our state and would be able to provide CIRM Scholarships to a cadre of excellent minority students drawn from our highly diverse student body. Even without any advertizing, we very quickly were able to identify a potential CIRM Scholarship applicant pool of 35 students of which 47% were women and at least 24% were minorities. These percentages would very likely increase once Scholarships were announced and formal recruitment started. In summary, funding our proposal will provide educational opportunities for significant numbers of students from underrepresented groups and



will help bring stem cell research to the Inland Empire (a significantly underserved region of our state) in direct support of CIRM's goal for diversification.

Secondly, we are very confused and surprised by the reviewers' comments on our current Training Grant proposal (#TG2-01167). When we submitted a proposal (T3-00005) in response to CIRM's first Training Grant RFA in 2004, we received a score of 70 and an evaluation of "highly meritorious recommended for funding" (reviews are attached). Although we were extremely disappointed that the ICOC decided not to take this recommendation and fund this proposal in 2004, we proceeded as though we had been funded and began training students in stem cell biology using our own resources (see below for details). During the past three years, we continued to grow and improve our stem cell program which enabled us to submit in 2008 what we thought to be a much stronger proposal than the one recommended for funding in 2004.

The following points, which were included in our 2008 Training Grant proposal, summarize how our stem cell program has grown in the past 3 years. Many of these points specifically address suggestions made by the reviewers of our first proposal. We have:

- recruited two new stem cell faculty (Drs. Noboru Sato from the National Institute for Environmental Health Sciences and Nicole zur Nieden from the Fraunhofer Institute for Cell Therapy & Immunology). We now have a total of 9 UCR faculty plus two new adjunct faculty actively engaged in stem cell biology
- nine of our faculty have become engaged in new stem cell projects, three of which are funded by CIRM [RS1-00289-1, RS1- 00477-1, RN1-0053801]
- established a Stem Cell Core Facility with CIRM funding (CL1-00508-1)
- created a Stem Cell Center that oversees all stem cell activities on campus including research, courses, outreach – <http://www.stemcells.ucr.edu>
- increased faculty and student participation in national and international stem cell meetings
- increased publications on stem cell biology (e.g. this year, Dr. Sato and Dr. Talbot had stem cell publications in PLoS ONE and Human Reproduction, respectively)
- established a successful graduate course in Stem Cell Biology and Disease and a very popular graduate course in the Bioethics of Stem Cell Biology. Both have been taught for the past 3 years.
- developed 4 new stem cell courses that will begin next year – these include a hands on laboratory course in Culturing Human Embryonic Stem Cells, a Seminar for presentation of data by students, a Seminar for presentations by outside speakers, and a graduate course in Stem Cell Biology Applications and Technology jointly taught by life science and engineering faculty.
- interfaced with several biotech companies working with stem cells
- trained 11 graduate students and 3 postdocs in stem cell laboratories.
- held joint stem cell meetings with our sister campus UCI



Given the many measures that strengthen and improve our stem cell program we were shocked to find that our score dropped 19 points to 51 and our evaluation became 'not recommended for funding'. The discrepancy between the two reviews is very difficult to understand, and I hope that you will be able to provide some clarity and help us understand the standards used by the CIRM Grants Working Group for Training Programs.

In summary, by all objective criteria, our proposal is better now than it was when we submitted our first training grant in 2004. We do not understand how our evaluations could have dropped given our improvement in every category and our strong "highly meritorious recommended for funding" review on the first proposal from which the current proposal evolved. We hope that you can clarify this situation for us and consider the information provided herein in your deliberations on January 29th. We recognize the formality of the review process, but disservice will be done to many qualified underrepresented students who may not have opportunities to train in this field for reasons that are difficult to understand. We would like you to give special consideration to our proposal for funding in keeping with CIRM's programmatic goals for reaching the under-represented and under-served citizens of our state, and ask for some level of funding. We hope that a positive outcome will be possible and that deserving underrepresented students will be able to be partners in stem cell biology as this scientifically and economically important field emerges in our state.

I greatly appreciate your time and thought in considering this request.

Respectfully yours,



Prue Talbot
Professor of Cell Biology
Director, UCR Stem Cell Center



TG2-01167: Training Program in Stem Cell Biology - a Multidisciplinary Approach at [REDACTED]

Program Type II - Intermediate training programs

Recommendation: Not recommended for funding
First Year Funds Requested: \$615,431

Scientific Score:
Total Funds Requested: \$1,898,813

Public Abstract (provided by applicant)

Our program's primary objective is to train and prepare pre- and post-doctoral fellows to become excellent scientists and leaders in stem cell research that are able to integrate multiple approaches from different disciplines in this emerging field. A secondary goal is to recruit and educate a diverse work force in stem cell biology to ensure that under-represented minorities and women in California will participate fully in this segment of the biomedical enterprise. We are the largest academic and research institution serving the state's [REDACTED]; as a designated a Hispanic Serving Institution, we have an excellent record of recruiting, training and graduating minority students and women. Our new medical school begins faculty recruitment in 2009; as the first new medical school in the nation in this century, we plan to integrate stem cell biology into the medical school curriculum. This Level II application requests funding for 6 pre-doctoral and 4 post-doctoral CIRM Scholars per year. Our program consists of intramural coursework and activities enriched by extramural partnerships with neighboring academic and biotech institutions. Training begins with three graduate core courses, required of all CIRM Scholars, in Stem Cell Biology and Disease, Stem Cell Biology-Technology and Applications, and Bioethics of Stem Cell Biology. Scholars can select other courses including a wet-lab in Human Embryonic Stem Cell Culture (also open to CIRM Bridges students), taught in our newly constructed, CIRM-funded Shared Stem Cell Core Facility, a course in Advanced Topics in Stem Cell Biology, and an upper division course in Human Embryology. CIRM Scholars will participate in joint lab meetings with members from all of our stem cell labs and in seminars given by invited speakers from other institutions. A special feature of our program is that it is designed to foster a high degree of interaction among life scientists and engineers. Faculty from the life sciences, chemistry and engineering will be teaching the required course in Stem Cell Biology-Technology and Applications. CIRM Scholars will have the opportunity to be embedded in both life science and engineering labs, training them at an early stage for future interdisciplinary collaborations. Thus, CIRM Scholars will be able to conduct research on a range of stem cell projects including basic studies on signal transduction, differentiation, regeneration and disease to problems in translation including bulk production of cells, biosensors, and monitoring of environmental toxicants. Our program is enhanced by extramural opportunities including 3 month-long internships at local biotech companies and presentations at national and international stem cell meetings. With participating faculty from 12 graduate programs in four colleges at our institution, we have formed a well-integrated, interdisciplinary group of stem cell researchers, many of whom have won awards for outstanding research and teaching.

Statement of Benefit to California (provided by applicant)

The passage of Proposition 71 by the citizens of California clearly demonstrated the importance of stem cell research to our state. In order to develop stem cell-based therapies, it is essential to train a new workforce of scientists to address basic and translational questions regarding stem cell biology. Our proposed training program will benefit the people and the state of California by providing high-quality scientific and ethical training in stem-cell research to PhD graduate students and postdoctoral fellows who upon completing our program as CIRM Scholars will be well prepared to develop careers in this rapidly emerging field. Our CIRM Scholars will be trained in an integrated program that bridges the life sciences and engineering and will be especially well suited to participate in interdisciplinary projects and contribute to the leadership and workforce in the field of stem cell biology and its translation to stem cell-based therapies. Because CIRM Scholars in our program will be exposed to basic science, technology, and

applications of stem cell biology, our trainees will be highly qualified to address basic research questions and transform such information into clinical applications that will aid in the treatment of disease. Training in our program will prepare CIRM Scholars to fill diverse positions in academia, industry and government in the state of California. Our university, which is located in one of the most ethnically diverse and fastest growing regions of California, has a history of making strong contributions to our local citizens by training under represented minorities and women. One goal of our CIRM training program is to continue this tradition, and through courses, research, and enrichment activities, we will be able to open career opportunities for minorities and women in this important emerging area of the biomedical enterprise. Our program also offers outreach activities to other campuses, biotech companies, and local community groups that will provide additional value to the citizens at all levels in our area. In addition, by interfacing our program with our new medical school that will begin recruiting faculty in 2009, we will be in a position to bring unique enrichment and training opportunities to our CIRM Scholars and facilitate development of projects dealing with stem cell-based therapies within the newest medical school in California.

Review

This application proposes a Type II training program that would offer 6 predoctoral and 4 postdoctoral slots per year. All trainees are expected to take the required courses in Stem Cell Biology and Disease and Bioethics of Stem Cell Biology, in addition to other courses in stem cell biology-- Technology and Applications, Seminars in Stem Cell Biology, and a joint lab meeting in Stem Cell Biology. Trainees can choose to take optional courses including a one-week training course in human embryonic stem cells in the CIRM Shared Facility, and a human embryology course. An annual workshop with a neighboring institution that includes speakers and poster sessions is also part of the training program. The training also includes a 3-month internship at a local biotechnology company.

The proposed training program was regarded as a good opportunity for trainees to engage in high quality research relevant to stem cell biology. The proposed coursework appears reasonable, and the instructors are highly regarded as educators especially at the undergraduate level. However, the reviewers felt that the description of course work was minimal and lacking detail. Reviewers were interested in better understanding how the applicants would integrate training with existing teaching programs and this was not adequately addressed. A reviewer specifically noted that the curriculum does not leverage the potential for interdisciplinary training or interactions. The reviewer considered the absence of an integrated curriculum that includes designed opportunities to bring together diverse disciplines a serious flaw in the proposal. The size of the applicant pool of graduate students and postdoctoral fellows who would be eligible for this program was also not made clear to reviewers.

The Program Director was noted to have a good record of training students and teaching. The director's research, education, and administrative experience make him/her well qualified to direct the proposed program. The director's record of external funding is not particularly strong, however, raising some concerns about sustainability of the planned programmatic efforts. The program also proposes an Associate Director who is a recently hired stem cell biologist. The advisory committee consists of well-qualified scientists who are participants in the program. Thus, the committee composition does not afford the necessary external, unbiased voice that would be optimal in an advisory committee to provide feedback on the program.

The faculty mentors have solid records of training undergraduate and graduate students, as well as postdoctoral fellows. They have uniformly excellent publication records, as well as good track records in obtaining external funding to support their research programs. There are 12 mentors already involved in stem cell research with a range of expertise from oogenesis to small organic molecules to toxicology to bioengineering of scaffolds. Two of these are from neighboring institutions. An additional 9 mentors are described as entering stem cell research. However, reviewers noted that most of the mentors are engaged in research that is peripherally related to stem cell research and most appear to be new to the

discipline. Therefore, reviewers felt that the program offered relatively little breadth or depth in stem cell research.

Reviewers also felt that there are relatively few examples of successful training programs currently at the applicant institution that target predoctoral and postdoctoral trainees, as many are geared to undergraduate students. A program in chemical genomics is one example provided in the proposal narrative that has been quite successful in developing interdisciplinary courses and research projects among the participants. Reviewers highlighted that the institution serves a large Hispanic population, and thus the potential for increasing access to stem cell biology to a diverse population is strong. Reviewers would have liked to see more detailed data on the demography of the participants in any of the graduate programs, but were confident that the institution would be successful in recruiting under-represented graduate students and postdoctoral fellows to this program. The institution appears committed to fostering stem cell research on their campus. In addition to the new stem cell core facility, two hires in stem cell biology were recently made and there is some indication that hiring for a new medical school may include a significant number of stem cell researchers.

Overall, the proposed program has great potential to increase the participation of under-represented minority students, particularly Hispanic students, in stem cell research. The current proposal represents an adequate training plan, but is limited by the lack of depth and breadth in stem cell biology. In addition, the potential for interdisciplinary training is not well developed.

The following Working Group members had a conflict of interest with this application:

Brivanlou, Ali