



## REPU: Training the Next Generation of Peruvian Scientists

For a long time, scientific development in Peru was not a priority. Fortunately, the landscape is changing. The Peruvian government is boosting the budget of the Technology and Science National Council, the Peruvian equivalent of the U.S. National Science Foundation.<sup>1</sup> However, Peru still scores low on most scientific capacity indexes due to low historical governmental support for science, a lack of scientific networks inside and outside the country, and minimal production of scientists with graduate or post-graduate training. Although government commitment is critical to overcome the complex issues facing Peruvian science, sometimes help can come from unexpected places. One ongoing science outreach effort, the Research Experience for Peruvian Undergraduates (REPU) program, is generating a substantial and sustainable change in the Peruvian scientific scene.

REPU seeks to advance the training of the next generation of Peruvian scientists. Specifically, REPU complements Peruvian undergraduate scientific education by setting up 10-week research-intensive internships at laboratories in the United States and Europe. The program brings motivated and outstanding Peruvian undergraduates to complete internships in the biomedical sciences, chemistry, and engineering fields. Its main goal is to help build scientific capacity in Peru by creating a long-lasting network of young, well-connected scientists who are committed to helping Peruvian science.



Kenyi Saito-Diaz



Sofia Espinoza Sanchez

### Early Years

REPU was launched in 2007 by Abel Alcázar-Roman (then a graduate student at Vanderbilt University) and Mev Domínguez (then a graduate student at A. C. Camargo Hospital).

Their initial idea was simple: to bring a Peruvian biology undergraduate to do a research internship abroad. REPU received 16 applications that year, and in 2008, Kenyi Saito-Diaz was invited to work in Daniela Drummond-Barbosa's laboratory at Vanderbilt University. He studied stem cell development in *Drosophila* egg chambers. The response to the program from both the student and the host laboratory were enthusiastic. This first internship revealed that Peruvian students were interested in this kind of research opportunity, and that the U.S. scientific community was willing to help. In 2009, Alcázar-Román moved to Yale University to complete a postdoctoral fellowship, and the REPU program moved with him. He invited Sofia Espinoza to the Christian Tschudi and Elissabetta Ullu laboratory to work on small noncoding RNA. These two experiences helped REPU to build a reputation, which would help in the years to come.

In 2010, four students were selected to work in labs studying protein quality control, autophagy, ribosome biogenesis, and calcium signaling. New activities were added, including a weekly journal club, research-in-progress talks, and the REPU Seminar. Journal clubs allowed the participants to sharpen their reading skills and discuss primary scientific literature. The research-in-progress talks gave students an opportunity to discuss their research, focusing on their working hypothesis and the experiments they proposed to test it. Finally, the

REPU Seminar was conceived as a meeting open to the public, where participants presented their research at the end of the internship.

## Expansion

After these successful experiences, the program grew significantly. The number of REPU applicants grew from a few dozen to more than a hundred a year. In the past 7 years, REPU has implemented several changes. Now REPU sets up 10-week research-intensive internships at laboratories in the United States and Europe (Yale University, Vanderbilt University, Purdue University, and Universidad de Navarra). So far, 25 Peruvian undergraduates have participated in REPU-sponsored internships. Due to the success in recruiting students from the biomedical sciences, in 2013 REPU expanded to the fields of chemistry and nano-technology. REPU also plans to expand to physics in the near future.

## The REPU Experience and Its Impact

The skills that students acquire through participating in REPU are fundamental for their future plans and help them define their scientific interests. As James Cabrera (REPU 2014) says, “The REPU experience... gave me the opportunity to improve by learning from experienced scientists. Also, as a consequence of my participation in the program, I am going to come back to Yale University as a post-bac research associate at the Timothy Newhouse laboratory.” Indeed, several students have been invited to stay as research associates in their host laboratories after the program.

The REPU experience also encourages participants to continue their scientific training by applying to summer internships or pursuing graduate training. For instance, Omar Julca and Eliana Torres, two REPU alumni, were the first Peruvian students to be accepted in the Vienna Biocenter Summer School, and Maria Jesus Olarte participated in the Ludwig Maximilian University Summer School in Munich. Additionally, REPU alumni have had a 100% acceptance rate in graduate school programs and have chosen to pursue post-graduate studies at some of the best graduate programs and universities around the globe, including Yale, Vanderbilt, Stanford, Harvard, Baylor,

Columbia, and the University of Connecticut in the United States, as well as Lund University in Sweden. The high quality of their work and their motivation also make them outstanding students, and they leave a positive impression on the PIs at their host laboratories.

REPU hopes that its participants will be leaders in the Peruvian scientific community and help push the development of science in Peru. REPU alumni have shown serious commitment to the advancement of Peruvian science, most visibly by giving talks about their experience at Peruvian universities, high schools, and even the best scientific institutions in Peru, encouraging fellow students to participate not only in REPU but in other training opportunities as well. Students' networks are also growing outside Peru. In fact several former students currently participate in globally recognized scientific forums. For instance, two of our alumni will be part of the 64th Lindau Nobel Laureate Meeting as Young Scientists, and one has participated in the Clinton Global Initiative University. Moreover, our alumni are involved in other science outreach efforts as members of the ASCB Committee for Postdocs and Students and iBioAmbassadors for iBiology.org. Our students contribute not only to Peruvian science, but to science in general.

Every year the program grows and improves with combined efforts from the current board and alumnae. Former REPU students continue to contribute to the program's development when they enroll in graduate school. REPU's first two students are the current program directors: We anticipate that this model of replacing current leaders with former participants will make the program sustainable into the future. We would even venture to say that this format could be reproduced in other countries that face similar difficulties with lack of funding and researchers, such as Bolivia and Ecuador.

## Conclusions and Future Directions

Since 2008, the REPU program has grown substantially. Currently, there are 32 active members and many more are interested in expanding the program. In the next years, REPU will seek to expand to new branches of sciences like physics. Also, REPU will start another branch in Canada, further aiding in the training of Peruvian scientists as well as

expanding its student network. In tandem with the development of REPU, the Peruvian government has begun to pay more attention to the development of science as an engine to push national growth, and REPU alumni are becoming the best candidates to lead this change. ■

—*Kenyi Saito-Diaz, Vanderbilt University, and Sofia Espinoza Sanchez, Yale University*

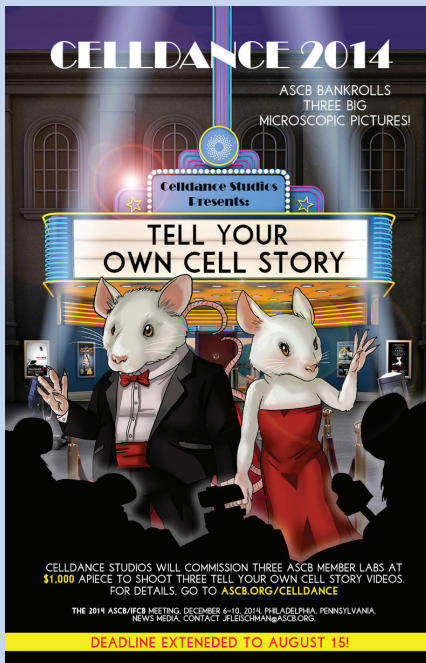
## References

<sup>1</sup>Portillo Z (12 January 2012). Peru to boost science-industry links. *Nature News*. [www.nature.com/news/peru-to-boost-science-industry-links-1.9798](http://www.nature.com/news/peru-to-boost-science-industry-links-1.9798).

## Note

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# Celldance Extends “Tell Your Own Cell Story” Video Proposal Deadline



Microscopic movie moguls have two more weeks to submit their “Tell Your Own Cell Story” proposal to ASCB’s Public Information Committee (PIC), which will commission three live cell imaging videos at \$1,000 each to be shot on location in the labs of ASCB members. The new deadline is August 15.

“In a very modest way, we are looking to underwrite cell biology films that balance an accessible narrative, rock-solid science, and awesome imagery,” says PIC Chair Simon Atkinson, explaining PIC’s new role as a microscopic motion picture producer.

The three video productions are aimed at classrooms and the whole world, Atkinson says. The ASCB-commissioned labs will deliver a rough-cut of their video to Celldance Studios (a PIC subcommittee chaired by Duane Compton), which will provide post-production services before unveiling the cell story videos at a special live online press conference and at the 2014 ASCB/IFCB Meeting in Philadelphia.

Celldance Studios will directly solicit Tell Your Own Cell Story proposals from ASCB member labs known for their high-quality imaging. “In addition, we are also seeking self-nominated proposals from ASCB member labs,” says Atkinson. “By going directly to ASCB member labs known for their high quality video microscopy, we hope to commission films from some of the leading microscopists working today. By leaving it open to any ASCB member lab to pitch us a proposal, we hope to keep an eye out for new talent.”

The extended deadline for pitching your Tell Your Own Cell Story video proposal to Celldance Studios is August 15. Once commissioned, each of the three ASCB member labs will be expected to deliver a rough-cut video by October 31.

To pitch your cell story video, send Celldance Studios a short description (800 words tops) or simple storyboard describing the cell story you wish to tell on video. Give the organizers a brief description of your imaging methods, and, if possible, include a link to a sample clip of your lab’s video work. (The video clip does not have to be about the proposed cell story but should showcase your lab’s technical prowess.) Send your pitch or direct your questions to PIC liaison and ASCB Senior Science Writer John Fleischman ([jfleischman@ascb.org](mailto:jfleischman@ascb.org)).

For complete information and more details on Tell Your Own Cell Story and the Celldance Studios 2014 Commissions, go to [www.ascb.org/celldance](http://www.ascb.org/celldance). ■

—*John Fleischman*