Collaboration: From Worms to Blood Stem Cells

By Dan Fost

The simple worm piqued the budding young scientist’s interest in developmental biology. I loved it, he says.

Robert Blelloch, MD, PhD, followed that passion through fellowships and into work with blood stem cells. It was so exciting to see how many different ways blood stem cells were being used to treat patients, he says.

Stem cells also proved to be his route into UCSF, where, although his specialty was pathology, he ended up with an appointment in urology as well, tackling prostate cancer. That’s life at UCSF, where it seems that nearly every department works with every other department.

Nothing happens here through a single program, Blelloch says, seated at his desk in the new Ray and Dagmar Dolby Regeneration Medicine Building. Every principal investigator in this building has a second appointment in another department, he says.

Blelloch works with colleagues in many different fields:
- He published a paper with the bioinformatics group at UCSF's Helen Diller Family Comprehensive Cancer Center, profiling small RNAs. "One of the biggest growth areas in cancer research is being able to follow a patient's disease," he says. "Is the disease progressing? Do we treat it aggressively or not?" The scientists developed an assay to look for signatures of small RNAs in the blood that indicate disease severity and response to treatment, and they're looking to study it in patients.

- He is publishing a paper with Marco Conti, MD, director of UCSF's Center for Reproductive Sciences, studying how certain genes disrupt the development of the oocyte, or unfertilized egg, which should provide insights into infertility.

- He has a paper in the works with Arturo Alvarez-Buylla, PhD, an investigator in UCSF's Brain Tumor Research Center, on efforts to follow stem cells that give rise to neurons in the hippocampus, a part of the brain important in learning and memory. In experiments with mice, they've found that "as the mouse ages, the number of cells expressing a specific marker and with stem cell properties decreases dramatically," Blelloch says. "Can we reinvigorate those aging cells to produce neurons again? If yes, it would have potential applications for treating the aging brain and neurodegenerative diseases such as Alzheimer's?"

"These collaborations make a point that stem cells can teach us a lot about many diseases," Blelloch says. "For example, you could argue that cancer is basically a bad stem cell. Understanding what makes a bad stem cell? and what a bad stem cell does? gives us a lot of ideas of how to follow and treat cancer."

Blelloch sees tremendous benefits in having his research lab so close to UCSF's world-class medical center. "We can maintain a basic science group of faculty with the desire to take that basic science as quickly as possible to the clinic," he says.

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