Scientist & Postdoctoral Positions Available

Experimental Studies of Ultraconservation and Gene Regulation by Nonsense-Mediated mRNA Decay Induced by Alternative Splicing

Research Group of Steven Brenner
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Project background
Nonsense-mediated mRNA decay (NMD) is a cellular RNA surveillance system that recognizes transcripts with premature termination codons and degrades them. Several years ago, we discovered large numbers of natural alternative splice forms that appear to be targets for NMD, and we speculated that they might indicate a mode of gene regulation. This is confirmed by our finding that all members of the SR family of splice regulators have an unproductive alternative mRNA isoform targeted for NMD. Strikingly, the splice pattern for each is conserved in mouse and always associated with an ultraconserved or highly-conserved region of 100 or more nucleotides of perfect identity between human and mouse. Remarkably, the unproductive splicing and exceptionally conserved sequences seem to have evolved independently in nearly every one of the genes, suggesting that this is a facile mode of regulation.

Project description
Our computational experimental studies have identified thousands of human alternative isoforms that are likely targets of NMD, some of which are associated with ultraconserved elements. This position is for an experimental researcher to understand:
1) The functional significance of alternative splicing coupled to NMD
2) The functional significance and evolutionary mechanisms that underlie ultraconserved elements

This project will use a variety of RNA molecular biology technologies, as well as newer approaches including RNA-Seq high-throughput sequencing, microfluidic massively-parallel quantitative real time PCR, and Sangamo genome editing.

Position requirements
Candidate should preferably have a Ph.D. in molecular biology or related field with a strong publication record and strong professional references. The ideal candidate will be an expert experimentalist in some area of RNA biology and capable of learning new technologies. As this position will involve writing research papers and working closely with both experimentalists and computational biologists, communication skills and the demonstrated ability to work independently will be weighted heavily. Travel required.

The Berkeley academic environment
The Brenner lab is an interdisciplinary research group, at the University of California, Berkeley, one of the world’s premiere research universities. We are associated with the Department of Plant and Microbial Biology, the Department of Molecular and Cell Biology, the Department of Bioengineering, the Biophysics Graduate Group, and Lawrence Berkeley National Lab. Donald Rio and his group are close collaborators for this project.

Interested applicants should have statement of interest, CV, transcript, and letters of reference sent to jobs@compbio.berkeley.edu

For more information, see http://compbio.berkeley.edu/