

SCISOC SPOTLIGHT

BY THE CAMBRIDGE UNIVERSITY SCIENTIFIC SOCIETY

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RESEARCH FOCUS:

RNA MOLECULAR
BIOLOGY

My lab focuses on the **molecular mechanisms and consequences of alternative pre-mRNA splicing (AS)**. AS is a mechanism that allows individual genes to produce more than one mRNA - often encoding functionally distinct protein isoforms. The majority of human genes undergo AS and **its misregulation can lead to diseases, such as myotonic dystrophy**. In my group we investigate the regulation of AS in vascular smooth muscle cells, which line blood vessels. These cells are not terminally differentiated and can alter their phenotype from a differentiated contractile phenotype to a more motile, proliferative phenotype. This **phenotypic change is a result of a gene expression programme**, part of which is programme of regulated changes in AS. **We are particularly interested in the molecular mechanisms that drive this AS programme**, involving the action of various RNA binding proteins. We are also interested in the consequences of the AS programme, which affects numerous components of the actomyosin and cell adhesion machineries as well as other splicing and transcription factors.

WHY RESEARCH?

I just carried on doing what interested me. At the end of my BSc in Biochemistry it seemed clear that a career that would remain close to the molecular biosciences I'd been learning about would involve a PhD first. That hardly seemed like a decision. I'd enjoyed undergraduate lectures on the biochemistry of muscle contraction and I carried out PhD research on proteins that confer Ca²⁺ regulation to the actomyosin interaction. This work involved lot of protein purification and characterisation and I decided that I should next learn some molecular biology. This was a big decision point; undertaking postdoctoral research in the USA was the best course of action scientifically, but I didn't really like the idea of going to live there. However, after arriving in Boston there was no looking back; it was the most fantastic place in which to live and do science. I worked for 6 years in Harvard Medical School and very nearly didn't move back to the UK, but a job came up in Cambridge at the right time.



"Experiments don't always work out how you expected the first time. So you need to be resilient and tenacious."

ONE PIECE OF ADVICE...

But the pay-off is the buzz you get when an experiment tells you something that no one else has ever known before. Be open-minded about the research questions that interest you; go to research seminars that have no relation to your own interests - you're more likely to get new ideas. Be open minded about career possibilities. I feel incredibly privileged and lucky to have been able to pursue a career where I actually get paid for doing what I enjoy. But doing PhD and postdoctoral research is not a linear path to a career in academia - there are many interesting and rewarding research and research-related career opportunities in other sectors that build upon the skills developed as a university researcher. Find out about them!