

Pain killers: the London Pain Consortium

John Wood, Professor of Molecular Biology at the Wolfson Institute for Biomedical Research, **Steve McMahon**, Professor of Physiology at King's College London, **Franziska Denk** and **Alva Chen** talk about their research at the London Pain Consortium (LPC).

JW: The real problem is chronic pain and disease-associated pain, pain which isn't evolutionary or physiologically useful and which actually stops people from being able to function and makes them depressed, and actually it's a really vast problem. I think something like one in five of the population have got a pain problem, and a third of those people are very, very poorly treated with present-day medication.

SM: The London Pain Consortium, it was a response to the Wellcome Trust's initiative, it was an attempt to pull together people in London with expertise in preclinical mechanisms, not so much treating pain but in understanding basic mechanisms of pain, to get them to synergise through their interactions as a research group, but also to provide training to young people, young scientists, PhD students, to provide that training but in a modern context.

JW: What we try to do is train young, enthusiastic and very bright students and postdocs and give them a feel for every element of pain research.

SM: It's very easy for us to create training projects which involve a single student spending time in multiple laboratories, and in fact that's an absolute requirement for all of our PhD programmes is that every substantive PhD project has to take place in at least two laboratories.

FD: I could just go to another LPC lab and just do some work there, and so it's really really collaborative. I mean this took like a week to set up – I told my old supervisor “hey, you know, it would be actually much more useful if I did it in John's lab” and he was like “sure”. And then I sent John an email and John was like “sure”. Whereas otherwise it would be much more lengthy, it wouldn't really work that way.

AC: The most beneficial thing I would say is the first rotation year, you get exposed to all kinds of techniques and also because of, we have so many pain researchers in the Consortium, you get to meet a lot of people in your field and you get to know a lot of people, and that will help you a lot along your career.

SM: Increasingly in the last couple of years I've become quite fascinated by the genetics of pain. So at the moment we're involved in a number of studies of collecting large cohorts of people together, collecting DNA to identify loci that may be associated with high or low pain regions.

JW: We developed the technology to specifically take genes out in damaged sensory neurons. This led to a discovery by Mohammed Nasser in the lab in 2004 that one sodium channel, Nav1.7, was essential for many aspects of the pain system. It transpires that two sets of mutations which cause again a function of this channel actually cause enhanced pain. One of which is erythralgia. David Bennett took a DNA sample from the blood of the patient and then we

checked through the DNA sequence and we found that one particular base had been mutated to give an altered amino acid within the structure of the channel.

AC: The mutation we found is actually a normal mutation. No one has been reported the mutation at this position before so I was very excited when I found the mutation.

SM: Some of the work I think that John Wood has done on sodium channels, I think some of that will produce fantastic insights and, hopefully, new drugs.

JW: The real excitement comes from the fact that people without this channel are really absolutely normal and that's astonishing, because that suggests that if you can block this channel you can block pain without side-effects.

SM: I think there'll always be chronic pain, it's a battle that can never be won but it's certainly a battle that's worth fighting.

AC: I think pain research is really going to help a lot of people and that's mostly my drive for my PhD and that's why I joined into this big family.

[End of transcript]