



March 2010 Scientist of the Month

Dr. Peta Bonham-Smith, Department Head and Professor, Department of Biology, University of Saskatchewan



Peta Bonham-Smith is originally from a small town, Peterlee, on the northeast coast of England (coal mining country). After completing grammar school she left home for Wolverhampton Polytechnic (midlands of England) where she completed a B.Sc. in Animal Physiology & Biochemistry. Not knowing what to do with a biology degree, she moved farther away from her home town, to Southampton (southern England) where she worked in a laboratory at the General Hospital, isolating antibodies from body fluids. In the early 1980s, having moved about as far from “home” as possible, she left the UK for the University of Calgary, Alberta, where as well as playing field hockey, soccer and learning to downhill ski, she completed her Ph.D. in Plant Physiology, looking at how plants respond to high temperature stress. Having become

used to western Canadian winters, she and her husband, Dr. Keith Bonham (Senior Research Scientist, Saskatoon Cancer Centre) then left Calgary for the University of Arizona in Tucson where Dr. Bonham-Smith first encountered the plant ribosome. The ribosome is the natural nano-machine found in all cells that is responsible for the synthesis of proteins. It is made up of two parts – one large and one small, and each part is composed of nucleic acids (rRNA) and ribosomal proteins. Functional ribosomes are integral to cell survival and are also found in chloroplasts and mitochondria.

During her post-doctoral research at the University of Alberta, the DNA sequence of the first chloroplast genome (in tobacco) was published. This was fantastic news as it allowed for some rudimentary bioinformatics analysis of chloroplast gene organization and structure, including ribosomal protein genes. Having gone from -30°C winters to 40°C summers it was the winters that won out and Dr. Bonham-Smith returned to Calgary where she was able to initiate research on the plant cell ribosome. This interest in the plant ribosome and her long-time interest in plant responses to extreme temperatures have been the basis of her current research program in the Department of Biology, University of Saskatchewan, where she has been a faculty member for the last 16 years and is currently Department Head. Dr. Bonham-Smith’s interest in the plant ribosome

stems from the fact that within a plant cell there are more possible combinations of rRNAs and ribosomal proteins to make different ribosomes than there are combinations in a 3x3 Rubik's cube. Why such rich diversity? What does the plant cell gain from such possible variety? The answers to these questions will not only shed light on one of the cell's most fundamental processes – the synthesis of proteins, but will also open the door to some understanding/control of plant growth and development.

Dr. Bonham-Smith was the first Director of the College of Biotechnology at the University of Saskatchewan, and she is currently on the board of Directors for Saskatchewan Research Council (SRC). The SRC conducts research in a number of areas with significance to Saskatchewan: Agriculture, Biotechnology & Food; Energy & Alternative Energy; Environment (including remediation); and Mining & Minerals.

What, or who, inspired your decision to become a scientist or to work in your area?

I have always had a keen interest in sports and science; however, growing up I always wanted to be a medical doctor. This may have had something to do with my mum being a medical secretary and me “hanging out” in hospitals a lot. Well, I did not do particularly well at grammar school as I spent a little too much time on sports and in the UK (back then) medical school was direct entry from high school. So instead I did what I thought was the next best thing, a Biology degree. I loved Biology, in particular Animal Biology. After my degree, working in the hospital in Southampton, I became aware of graduate students in the lab who were able to do pretty much what they wanted. That's what I wanted – to do research on what I wanted. To do that I had to go to grad school and where better than Canada – a new adventure. I never had it in my mind to be a scientist/academic but I am sure glad that is where I have ended up – I love it!! I do have to thank my parents for always encouraging me to do whatever I wanted to do and go wherever I wanted to go. They have had some pretty neat trips out of it also.

What is the most interesting thing you have ever learned or discovered?

From my work, the most interesting thing I have ever learned or discovered is anything that no one has ever seen or done before. Looking down a microscope and seeing something that no one has ever seen before continues to excite me – it is a tremendous high!! From my teaching, it is seeing the “light go on” in the minds of students when I have succeeded in putting across a difficult concept. From my personal life, it is seeing how different your children can be from you – genetics is wonderful!!

Of what accomplishments are you most proud?

When I was in grammar school and mentioned to the career counselor that I would like to do medicine, I was advised to think about nursing!!!! I am proud of where I have come from. I am proud of where I am. I am proud of my future as I know I can go and do anything I would like to. I am proud of all my graduate students, current and past, who bring their youthful enthusiasm to my lab day in and day out. I am proud of the undergraduate students who I have had the pleasure of teaching and who, after 4-5 years

of study, are now the new biologists raring to start their own careers in the exciting world of biology.

Were there any obstacles in your education or career, and how did you overcome them?

As a female in the UK in the 60s and 70s, there were more obstacles with respect to sports than science. Other than the career counselor in grammar school I have had nothing but encouragement from all friends, associates and family. I have a very supportive husband, without whom it would have been very difficult to achieve all I have to date.

What is a typical (work) day like?

A current day starts at 7:00 a.m. with a shower and leaving the house by 7:30 a.m. to drop a teenager at school. At work I will lecture from 8:30-9:30 a.m. and then the rest of the day is usually meetings with students, staff, and faculty to deal with departmental issues. I may also have university or college meetings to attend at sometime during the day. Three times a week I do take a lunch break to work out at the PAC. Twice a week I leave work at 5:30 p.m. to pick up teenager from soccer practice. I usually try to be home by 6:00 p.m to eat the glorious dinner that my husband makes. Two or three times a week I will spend the evening either watching or playing in a soccer game (indoors during the winter!!). If I have some work to catch up on I will do that after dinner, usually in front of the TV.

What advice do you have for future scientists?

Learn from everyone around you, for everyone has something to offer you. However, the soundest piece of advice that I was ever given is, enjoy the science as much as you enjoy the rest of your daily life.