

## Smart Science in the Sunshine State

***"I consider myself to be a biochemist, an inventor, a tissue engineer and a dedicated developer of new intellectual property opportunities." Zee Upton***

Zee Upton is a Professor in Life Sciences and Leader of the Tissue Repair and Regeneration Program in the Queensland University of Technology (QUT) Institute of Health and Biomedical Innovation. She is the technical founder and Consulting Scientist for Tissue Therapies Limited and a Smart State Senior Fellow in Queensland.



*Zee Upton with her team at the opening party for the Institute of Health and Biomedical Innovation.*

Zee began her scientific career in Adelaide in 1981, working as a Laboratory Technician at CSIRO. Whilst working full-time, Zee managed to complete an undergraduate degree in Genetics and Biochemistry. She went on to complete her Honours degree part-time through the University of Adelaide investigating recombinant chicken insulin-like growth factor-I variants. After gaining first class honours, Zee began a PhD in the same field. She was lucky enough to spend six months of her PhD overseas. She spent time in Chicago, with Dr Donald Steiner, and also in Edinburgh, with Dr Chris Goddard at the Agriculture and Food Research Council Institute (now the Roslin Institute). Zee flew through her PhD, submitting her thesis less than three years after she began her project.

Her first postdoctoral position was split between CSIRO, as part of the CRC for Tissue Growth and Repair, and GroPep (recently acquired by Novozymes), a spin-off company that now sells growth factors directly to universities and to biotechnology and media manufacturing companies. She soon gave birth to her first child and took 5.5 months maternity leave. Whilst on leave, she realised she needed a change, and subsequently moved her research team to Flinders University, where she lectured in aquaculture and biotechnology, and was provided with laboratory facilities for research. Zee was still employed by CSIRO, however, and her research was within the CRC, albeit the research direction changed

somewhat. Together with a collaborator at the Hanson Centre of Cancer Research in Adelaide, she discovered and characterised the specific interactions of growth factors with vitronectin, a protein important in cellular processes.

In 1998, she filed a provisional patent for this discovery through GroPep. GroPep was preparing to list on the Australian Stock Exchange and it was decided that the vitronectin:growth factor discovery would not be taken to Patent Cooperation Treaty stage. Zee decided to resign from the CSIRO and negotiated an exit agreement granting her freedom to build on all the intellectual property she had developed whilst working there. At this time, Zee's personal life was changing too. She had separated from her partner, her mother was undergoing treatment for bowel cancer, and she had fallen in love with her research collaborator. She decided to accept a position as a lecturer at QUT and move to Queensland. Zee's daughter, mother and new partner felt the draw of the sunshine state, and followed Zee to Queensland.

Whilst lecturing at QUT, Zee was able to attract Honours and PhD students to significantly advance the vitronectin:growth factor project. The vitronectin:growth factor discovery is now known as VitroGro®, and is thought to have commercial application in wound healing, so a new biotechnology company, Tissue Therapies Pty Ltd, was formed in September 2002. Tissue Therapies is undertaking clinical trials on the efficacy of VitroGro® in wound healing and has recently licensed the technology to Invitrogen for its use in serum-free cell culture.

Schemes such as the Smart State Grants in Queensland, utilised by Zee in the foundation of her company, provide a number of wonderful opportunities for commercialising research outcomes (see <http://www.sd.qld.gov.au> for more details). This is something that many of us should keep in mind throughout our research careers. Discoveries, such as Zee's vitronectin:growth factor finding, can lead to outcomes that are of significant value to industry and the wider community. Most universities offer free seminars on intellectual property, which would be of interest to postgraduate students and their supervisors. They provide advice on IP issues, university and state regulations, assignment and licensing and patents and commercialisation, and students are encouraged to make use of this fantastic resource early on in their careers.

*Julia Archbold*

**We want to make this page interesting to students, so please provide feedback about this page's contents, or your ideas for future issues, by contacting either:**

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## Post-PhD Careers – Segues In Science

As the end of our doctorate approaches, most of us would feel thrilled, or at least relieved, to come to the end of such a colossal task, and to finally draw the pieces of our sweat and tears together into a coherent body of work: the thesis. But often the reality is that completion fills us with anxiety and uncertainty for our future prospects, especially if we feel that we want to move away from the central dogma of postgraduate-to-postdoc-to-lab head that academia dictates to us. **Don't panic.** You are not only highly skilled in your scientific discipline but have proven your ability to cogitate, adapt, communicate and persevere by earning your letters, and you should think of the world as your oyster. Here and in the next issue, we try to give you ideas for shaping your future career, be it dedicated to research (see below) or taking an alternate path (see the December issue of *Australian Biochemist*).

### Postdoctorates – Things to Consider:

#### 1. What interests you?

You by no means have to continue in your current field for your first postdoc, but if you have found your passion, stick with it. Using your current skill set may help you in starting out, but learning new skills will broaden your experience, and your early career is a good time to do so. In the end, it's probably most important to choose an area you're excited about, and start there.

#### 2. What will your experience in the lab be like?

How much contact will I have with my supervisor? Will I be working primarily on my own or in a team? What kind of support network will I have? How many hours will I be expected to work? These questions are important, and can be difficult to determine, especially if you are looking to go overseas for your postdoc. You can tell how successful a laboratory is by its publication record and past awards and prizes, but this may not give you an idea about how postdoctoral projects are managed. If possible, try to talk to people in the lab who will be able to give you a better idea about how the laboratory is structured, and how projects are managed by the chief researcher.

#### 3. Where do you want to go?

Postdocs can be a great opportunity to live and work abroad, either overseas or interstate. Consider the location of your potential postdoc lab, as well as its research area and publication record.

#### 4. Funding

The Australian government offers two types of biomedical fellowships that provide your salary for four years. While procuring a fellowship may open doors, if you don't get one, don't lose heart. Contact lab leaders and discuss possible postdoctoral opportunities (perhaps with an introduction from your supervisor). Lab heads are often looking to expand their groups, and if they are well-funded they may create a position for you even if there isn't one advertised. In addition, there are many postdoctoral positions advertised, both in Australia and overseas (see below for employment sites). Remember that if you don't get a fellowship at the end of your PhD, you can re-apply after beginning your postdoc (you can have up to two years postdoctoral experience).

#### 5. Network!

The most important aspect of planning a postdoc is to talk to people. First, talk to your supervisor. He/she may be able to recommend a research group and provide an introduction. Remember that your supervisor is probably going to be the most important reference for your postdoctoral application. Talk to the head researcher of any lab that you are considering joining, to assess whether you think you will work well together. Conferences are an excellent opportunity to meet potential postdoctoral supervisors, and members of their groups. Try to attend national and international conferences. There are numerous funding opportunities for conference travel and registration costs: check the conference website, your university and professional societies such as ASBMB. If you plan to go overseas for your postdoc, attend a conference in the country or region you'd like to work in. Make a point to introduce yourself to potential supervisors, and then continue contact via email if you are still keen.

Funding opportunities and advertised postdoctoral positions in Australia and overseas can be found at:

<http://naturejobs.nature.com/js.php>

<http://www.newscientistjobs.com.au/splash.action>

CSIRO also offers postdoctoral fellowships and opportunities

<http://recruitment.csiro.au/asp/index.asp>

Don't forget the ASBMB employment site:

<http://www.asbmb.org.au/employment.html> and check out other professional bodies of which you are a member.

Lots of useful stuff including career snapshots can be found at NatureJobs:

<http://www.nature.com/naturejobs/magazine/index.html>

Hilary Hoare