



national science week 2011

Jarrod Green, UTAS School of Chemistry *Outsmarting the Brain*



The brain is a pretty exclusive place to be if you are a molecule. In fact, only molecules exhibiting particular properties are permitted inside. A blockade known as the blood brain barrier restricts the passage of molecules from the blood into the brain. Whilst nutrients and other compounds needed for the brain's normal function are ushered past this barrier, other molecules are usually left waiting in the bloodstream.

The blood brain barrier helps protect the brain from unwanted visitors like toxins, bacteria and viruses, but unfortunately it also excludes many drugs that could otherwise help fight disease. As a result, effective drug treatments for diseases of the brain are quite rare. What we need to do is outsmart the brain to get drugs inside.

As a chemistry honours student at the University of Tasmania, my research involves making modifications to the chemical structure of the anticancer drug Taxol to help it bypass the blood brain barrier. I carry out chemical reactions to prepare potential drugs that are then tested for their biological activity by our collaborators at the Menzies Research Institute. One of the ideas pursued in my research is that altering Taxol's structure in specific ways might prevent it from being recognised and pumped out of the brain at the blood brain barrier.

Being able to manipulate the building blocks of the universe (atoms) to make new drugs is a pretty exciting thing. In fact, it's just one of the many things I love about chemistry and science more generally. Science offers a way of thinking about and understanding the world that is a valuable and rewarding part of my life. Moreover, where else other than in science is it a legitimate academic activity to mix things together just to see what might happen?

As fun as it is to carry out chemical reactions, I also really enjoy talking and writing about science. Unable to give away my passion for writing, I decided to study a combined Bachelor of Arts and Bachelor of Science degree at the University of Tasmania, majoring in English, Journalism, Chemistry and Biochemistry. In addition to being involved in scientific research, I hope to play a role in communicating science and breaking through a different kind of barrier: the barrier that sometimes exists between science and the public.

Above all, I love the challenge of making compounds that have never been made before and knowing that I am contributing to research directed at improving people's lives. Also, let's not



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forget that being a scientist means you get to work in a team of fun and passionate people. Science is anything but a solitary activity. After all, we will need to put our heads together if we intend to outsmart the brain.

Find out more about chemistry at UTAS: <http://www.utas.edu.au/chem>
and the Menzies Research Institute: <http://www.menzies.utas.edu.au>

www.youngtassiescientists.com