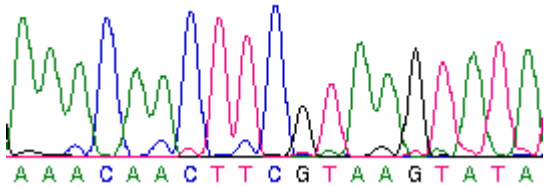


Edition 2- August 2006

### DNA for Dummies – An Ongoing Saga

DNA stands for deoxyribonucleic acid. It carries a cell's genetic information and hereditary characteristics around the body, determining whether we have, for example, blue eyes, straight or curly hair.



Key: A (adenine) C (cytosine) G (guanine) T(thymine)

DNA is made up of four substances, adenine (A), cytosine (C), guanine (G), and thymine (T), twisted together into a double helix and joined by hydrogen bonds. These bonds are between the complementary bases adenine and thymine or cytosine and guanine.

*Pictured above is an example of a DNA sequence.*

### Biotechnology in Australia

Australia produces almost 3% of the world's research in the biotechnology fields. Impressive given we only have 0.3% of the world's population! There are approximately 420 biotech companies, and more than 650 medical device companies, employing around 11 000 people. The industry spends \$647 million per year on related business expenditure on research and development.

### In the Northern Territory

The big news for the Northern Territory Government is Cabinet's approval of the *Policy for Access to and Use of Biological Resources in the Northern Territory*. Drafting of the supporting legislation is now complete and the bill will be tabled during the August sittings. The Territory is the third Australian jurisdiction, after Queensland and the Commonwealth, to have a framework regulating access to biological resources for bioprospecting purposes.

***The Snakevine, a native Territory plant, has been found to have antibiotic properties, as well as being effective against anthrax, tuberculosis, malaria, and golden staph.***

### Around the Country



Sydney based company Biosignal was awarded a \$1.5 million Commonwealth grant to develop new antibacterial coating for medical implants and devices. Furanones secreted by the eastern Australian seaweed *Delisea pulchra* have been found to have anti-microbial properties and may be used to prevent bacteria from adhering to items such as contact lenses and catheters.

Stirling Products Limited is an animal health company based in Western Australia focused on growth promoters for the meat industry. Trials to replace antibiotics and steroidal hormones to enhance growth rates and improve feeding efficiencies in livestock have been conducted using ST810, derived from a well known treatment for asthma. There has been a demonstrated 21% improvement in pigs and 5.5% in chickens in their feed conversion, as well as a reduction in fat of 30% in broiler chickens and 42% in sheep. The current global market for ST810 is estimated to be worth US\$4 billion.

*Confectionary company, Streets, has found that a protein found in the blood of a deepwater fish species could be used in ice cream to make it much creamier.*

## Around the World

Petroleum giant BP is providing US\$9.4 million in funding to establish an 8 000 hectare plantation of *Jatropha Curcas* in India for the production of biodiesel. *Jatropha Curcas* is a drought resistant plant, and has been found to be one of the most efficient potential energy crops, second only to palm oil. The project aims to produce nine million litres of biodiesel per annum.

*A gene from a fungus found in elephant poo could hold the key to economically viable cellulosic biofuels. This would enable biofuels to be made from plant matter like stalks, leaves and wood, rather than the grains, oilseeds and sugar cane that are currently used.*

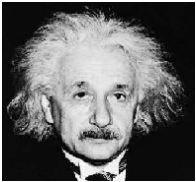
## The Drug Development Process

Extensive trials are required to get a product from source to shelf, a long and expensive process. A successful product will usually take around 10 to 14 years and cost between US\$800 million and US\$1 billion – a huge investment.

The process begins with a search for chemical and biological products with drug like effects. After preclinical trials, those compounds considered safe for testing in human volunteers progress to clinical trials. Out of every 5 000 new compounds, only five will make it this far. There are a number of phases in the clinical trial process.



## What the 'bio' terms mean . . .



- ❖ **Bioremediation** is the use of micro-organisms to remedy environmental problems, rendering hazardous wastes nonhazardous.
- ❖ **Sequencing** is decoding a strand of DNA or gene into the specific order of its nucleotides: adenine, cytosine, guanine and thymine. This analysis can be done manually or with automated equipment and requires analysing an average of 40 000 nucleotides.
- ❖ **Stem cells** are “undifferentiated” and have the potential to become many different types of cells. Stem cells can either be embryonic or adult, and have uses in many different types of research and medicine.

## Look out for the next edition of Bio Bits coming soon!

Some of things that you'll be able to find out about are:

- DNA for Dummies – the next instalment
- Bio news from around Australia and the world
- More on the drug development process
- Stem cells

If you would like more information on any of the topics covered, or have something that you would like included, please contact:

Murray Hird on 08 8999 7162 – email [murray.hird@nt.gov.au](mailto:murray.hird@nt.gov.au)  
or Kylie Higgins on 08 8999 5331 – email [kylie.higgins@nt.gov.au](mailto:kylie.higgins@nt.gov.au)