



In this issue • Nobel Prize winner in Darwin • less water more food • biofuels - are they the answer?

Welcome to the 4th edition of bio bits, an informal biotech newsletter designed to let you know about some of the new Biotech projects taking place in the Northern Territory, Australia and around the world.

### Australia's best in the Northern Territory

The 20 November 2007 saw the Department of Business Economic and Regional Development play host to the Northern Territory Bio Industry Forum 2007.

This year's impressive line up of speakers included the managing director of Johnsons and Johnsons Research Pty Ltd, Dr Susan Pond and a 2007 Nobel Prize winner from the Intergovernmental Panel on Climate Change, Dr Tom Beer. The event was a great success and received significant media coverage.



Hon Kon Vatskalis, Minister for Business and Economic Development, opens the Bio Industry Forum 2007



Leading bio industry speakers included (from left to right) Dr Mark Harrison, Dr Leo Hyde, Peter Bailey, Murray Hird, Dr Tom Beer, Craig Cormick, Dr Bart De Corte, Dr Susan Pond, Rohan McDougall, Dr Amanda Leach, Prof Andy Ball, Nick Evans, Dr Chris Battershill and Dr TJ Higgins.

### Nanotechnology news from around Australia

Victorian based Quintin Nanosystems has announced a world first rapid meningococcal diagnostic test.

The test works by using nanoparticles of gold which are covered in antibodies against a protein found on the surface of meningococcal bacteria.

In the presence of the bacteria the particles become clustered causing an immediate colour change and allowing meningococcal disease to be diagnosed in minutes rather than hours.

### Long legged leaders

Rick Shine and his team at the University of Sydney have discovered that cane toads at the fore of the invasion in the Northern Territory have longer legs than their counterparts.



These long legs have allowed them to invade at three times the rate of their early colonisation. However all that long distance jumping comes at a cost and large numbers of the longer legged toads have severe spinal arthritis.



## Biotechnology news around the world

### HARDY rice: less water, more food

With this year's Australian rice crop predicted to be the smallest on record due to the drought, rice that can grow under reduced water conditions could potentially save untold amounts of water worldwide each year. Researchers in Virginia have discovered and inserted the HARDY gene from the weed thale cress into rice to do just that. HARDY rice plants are able to photosynthesize more efficiently at the same time as reducing water loss from the crop.

### DNA for dummies: part 3

Your DNA contains four different base sugars called nucleotides. The order in which three billion of these are arranged into a chain within each cell of your body comprises your own unique DNA sequence.

If unravelled this chain would be over 2m long, yet amazing is packaged to fit into cells as small as 10 microns in diameter.

The full stop at the end of this sentence is 600 microns in diameter, 60 times bigger than your average cell nucleus into which 2m of DNA fits.

### Bio jargon: what it all means...

**Antibodies:** also known as immunoglobulins, these are proteins found in blood or bodily fluids of vertebrates, and used by the immune system to identify and neutralize foreign objects. Although the general structure of all antibodies is very similar, a small region at the tip of the protein is extremely variable, allowing millions of antibodies with slightly different tip structures to exist. Each of these variants can bind to a different target, known as an antigen.

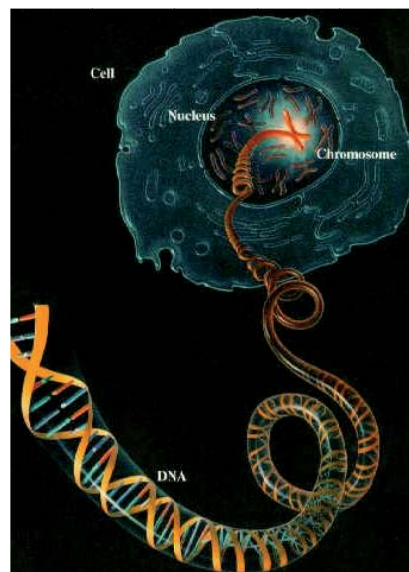
**Biopharmaceutical:** a drug created through bioengineering or biotechnological processes. Recombinant protein drugs, recombinant vaccines, and monoclonal antibodies, derived from one parent cell, are examples of biopharmaceuticals.

### Biofuels: the answer to rising fuel costs?

Biofuels are fuels of any kind made from living things, or from the waste they produce. In recent years the term "biofuel" has come to mean ethanol, diesel or other liquid fuels made from processing plant material such as corn, sugarcane and rapeseed or waste oil. First generation biofuels are those derived from food crops.

However, first generation biofuels are unlikely to be a long term solution to combating climate change as the sourcing of feedstock will have a negative impact on biodiversity, and will compete with resources required for food crops.

Second generation biofuels however are made from non-food feedstocks, such as the waste from agriculture and forestry industries and these have the potential to significantly reduce CO2 production.



DNA - unravelling the chain

For further information or to contribute to the newsletter contact:  
Biotechnology Support, Industry Development  
Department of Business, Economic and Regional Development  
GPO Box 3200 Darwin NT 0801

P: 8999 5331 F: 8999 5333  
E: [inga.thomson@nt.gov.au](mailto:inga.thomson@nt.gov.au) W: [www.nt.gov.au/business](http://www.nt.gov.au/business)

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## Look out for our next edition of bio bits coming soon!

- DNA for Dummies: the next installment
- More bio news from around Australia and the world