

# THE PLATYPUS GENOME

## BACKGROUND NOTES FOR JOURNALISTS

### WHAT IS A GENOME? (the 'blue print' of life)

The human genome is made of DNA, is about 3 billion base pairs long and contains around 20,000 genes. It is the combination of the genes we have and how they are controlled that helps shape who we are.

Not all of our genes are known, as yet. This is because it's extremely difficult to discover genes within DNA. About 99% of our DNA is considered 'junk DNA', ie. not genes. Trying to find which parts of the genome are important is like having a conversation at a heavy metal concert – there's just too much background noise to make any sense of it.

In genome science it is the differences that are important. Genes that carry out important jobs are conserved through evolution, while other genes, or parts of the genome, are more likely to change. By comparing the genomes of humans with other animals, such as the platypus, scientists can work out which genes have been conserved best through evolution.

The longer a gene has been conserved through time, the more likely it is to have an important biological role. So the platypus genome will help scientists to eliminate 'background noise' and focus on the important parts of our own DNA.

### GENOMICS

The first genome sequence was completed in 1995 and the human genome sequence was completed in 2003. In all, around 25 species of mammals have now been sequenced along with over 100 other species of animals, plants and microscopic organisms. Mammals already sequenced include the cat, dog, horse, cow, human and African elephant. More genomes are now being sequenced as the cost of sequencing decreases, and as technology improves.

### ORIGINS OF THE PLATYPUS

Mammals are made up of two living groups – those that give birth to live young (placental mammals and marsupials) and those that are egg-laying (platypus and several species of echidnas). Despite sharing characteristics with bird and reptiles, the platypus is classified as a mammal because it shares the fundamentals of all mammals, including fur and milk production. It is generally agreed that the platypus was the first species to diverge from all other mammals which is why this species is so intriguing to scientists. The last common ancestor of humans and the platypus was around 166 million years ago.

The platypus is the first monotreme (egg-laying mammal) to be sequenced. The world's first marsupial to be sequenced was an opossum from South America which created global news last year. Marsupials (eg. kangaroo and opossum) evolved more recently than the platypus, around 148 million years ago.

Prepared by the AusSMC