



## Welcome comments

Sequencing at ten base pairs per year was how the 1968 Nobel prize-winning team conducted their research into the genetic code and its link to protein synthesis, according to Ulf Pettersson, Honorary Chair of HGM 2006. Complementing this thought, and complimenting the research community, Leena Peltonen, President of HUGO, noted: “we now have over 480 complete genomes, predominantly thanks to the 700 or so delegates here today, a truly global group representing over 30 countries.”



Human Genome Meeting 2006  
Helsinki, Finland, May 31<sup>st</sup> – June 3<sup>rd</sup>

# HGM 2006 Newsletter – June 2<sup>nd</sup>

## Binge drinker or cheap date?

If you're always after 'just one more drink', or if you fall down drunk after just one, your behaviour could be partially explained by your genes. Carol Prescott, of the University of Southern California, discussed how her group has identified a region on chromosome 4 that is associated with tolerance to alcohol and binge drinking (having more than six drinks at a time) in a study of Irish twins. This region contains a cluster of ADH genes involved in the metabolism of alcohol, which are suspected to be involved.

“This is a relatively new field, so we have not identified any specific mutations yet. People were quite resistant to the idea that genetic factors could be involved in addiction, but work over the last ten years has changed that,” said Prof. Prescott.

Prof. Prescott's team has also identified the human equivalent of the *Drosophila* 'hangover' gene, which similarly associates with symptoms of alcoholism. Flies with mutations in this gene never increase their tolerance to alcohol, which was tested by timing how long it took the flies to fall out of the sky as Scholz and his team pumped increasing amounts of ethanol to the air they were breathing. The *Drosophila* and human genes are different enough that further research is needed to establish the effect of this gene on humans. But, if the functions are equivalent, mutations in the human gene may have a protective effect against alcoholism – as carriers could not manage to drink enough to become dependent.

## Tracing bioterrorists with microbial forensics

The US Federal Bureau of Investigation (FBI) is developing technologies and procedures to track down the perpetrators of bioterrorism. Dr Bruce Budowle from the FBI described how a new methodology termed 'Microbial Forensics' examines the genetics, biochemistry, and signatures of biological agents (bacteria, viruses, fungi, or toxins). A major component of microbial forensics is the analysis of nucleic acids to associate or eliminate putative samples.

In his presentation, Dr Budowle acknowledged that at present it is not possible to obtain a level of identification comparable to human DNA analysis because of the complexity and variety of bacterial genomes. “There's more than one species of bacteria, there's horizontal gene transfer, and both sexual and asexual reproduction,” said Dr Budowle. Another challenge facing the field is the cost of sequencing. “It costs around €100K to sequence a bacterial genome, which is feasible,” said Dr Budowle, “but what if I have 1000 bacteria?”

Dr Budowle stressed the importance of the proper use of the data collected from such investigations – over interpretation could lead to the wrong group or individual being accused, which would have serious repercussions.

A new technology, which may address some of the issues Dr Budowle raised, was launched at the conference. deltaDOT's Merlin™ DNA sequencer produces high quality data at low cost, without the use of labels. The Company is already working with an internationally-renowned forensic science provider to apply its label-free technology for human identification purposes, and is developing portable field-based forensic systems

## Propensity for obesity

Inheriting obesity may be easier than previously expected, thanks to DNA methylation. Rob Waterland and his team at Baylor College of Medicine, Texas, had previously shown, using the viable yellow agouti mouse model, that metastable epialleles vary their expression when methylated. Now Dr Waterland has shown that the level and state of methylation can be passed from mother to offspring.

Feeding pregnant agouti mice with methylation-promoting food supplements such as folic acid and methionine leads to the methylation of epialleles and alters gene expression in the offspring, causing them to be born heavier. A transgenerational study showed that successive generations became increasingly heavy. Dr Waterland showed that this increase in weight was directly related to methylation.

The next stage in the research is to seek out equivalent metastable epialleles in humans. Dr Waterland postulates that the current wave of obesity seen in the US, and increasingly in Europe, could be directly related to methylation. "By changing our diet, we could change our gene expression and phenotype," said Dr Waterland.

## Friday's conference highlights

Workshop 66(X): Eugene R Zabarovsky  
Epigenetic analysis of cancer cells using Not I microarrays

Symposium 17(IV): Michael Owen  
Genomic studies of schizophrenia: mapping madness?

Poster 304: Hans-Jörg Warnatz  
Generation and analysis of a comprehensive protein interactome of human chromosome 21

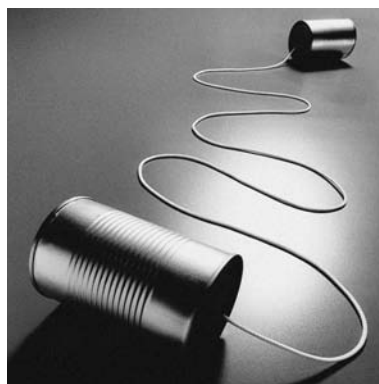
At HGM 2006 we've heard of many new genes being discovered, for nicotine dependency, diabetes, and Alzheimer's to name just a few. But, up here in the press office, we were wondering if any delegates were looking into the genes listed below? Or perhaps you are working on other elusive fields...do let us know.  
[hgm@northbankcommunications.com](mailto:hgm@northbankcommunications.com)

**PhD gene:** this gene causes all young graduates to pursue a dream of pushing back the frontiers of biology. However, after four years of expression, the gene leads to disillusionment and often induces the MBA gene leading to a change in careers.

**Frenetic football gene:** this gene is predominantly dormant and only expressed when a head-sized spherical object is present. Kicking of the sphere causes gene expression with the phenotype of hysteria, comprising of shouting at television sets, cheering at strangers across the street, waving of flags, and the desire to consume large quantities of alcohol.

**CSO gene:** this gene is commonly expressed by scientific entrepreneurs. It can eventually lead to formation of a company and massive wealth, although some mutants exhibit a 'this is the best idea since the double helix' phenotype, often leading to widespread redundancy.

**Guinness gene:** its phenotype results in selecting an Irish pub in which to drink. Expression of the gene appears to be upregulated when on holiday or overseas. And, given that initiation to Irish pub culture often results in repeat visits, some postulate that this is the first known gene that can be transferred horizontally (possibly from the barman).



The Northbank team of Lorna Watson, Gemma Bradley, and Adam Michael are running the HGM 2006 press office facilities and compiled this newsletter