

## Genetic privacy and piracy

**On the eve of a decision on a new gene diagnostics law in Germany, the debate about risks and benefits, although important, must not derail essential legislation.**

As *NCB* goes to press, the Bundestag, the national parliament of Germany, is due to debate the *Gendiagnostikgesetz* four years after the law on genetic testing was first proposed (GenDG; <http://www.bundestag.de/ausschuesse/a14/anhoerungen/105/index.html>). At several points, this important piece of legislation was on the verge of collapse because of intense criticism from medical societies, church, biotechnology opponents and civil liberty advocates. An informed debate on genetic testing is crucial, before legislation affecting key issues, including medical diagnostics, health insurance, employment, privacy, immigration and criminal databases, is set in stone. However, the topic of genetic testing and engineering tends to inflame debate in Germany, and it is important to keep the discussion rational, since a legal framework on genetic testing is unavoidable and overdue.

The proposed law rules out genetic discrimination, banning the use of test data by employers and insurance companies (although the ban for insurers is not absolute). One bone of contention is that prenatal genetic screening for late-onset diseases such as Alzheimer's has not been banned. Although legislation will have to be carefully crafted to minimize abuse (note that sex testing is excluded), attempts to ban what is essentially a non-invasive extension of the widely practised cytogenetic technique of amniocentesis seems ill-informed (termination informed by cytogenetic screening is legal in Germany and most other European countries). It is right to warn of increasing the pressure on parents to abort on the basis of non-definitive tests. The issue is partially addressed by the proposed requirement for professional counselling, but it would make sense to only make tests available that are designated by a national expert commission as sufficiently definitive and the conditions sufficiently debilitating.

One oversight that has been rightly noted is legislation dealing with research. However, the draft law is fairly explicit on 'DNA theft' (genetic testing, including paternity testing, without consent), outlawed in Britain since 2006 and currently before lawmakers in Australia. Non-consensual DNA testing is a growing problem in the USA, where private and largely unregulated DNA testing services are proliferating and legally offer tests on 'stolen' DNA. German law allows testing only by nationally accredited individuals and institutions. Notably, the British police force is exempt from the ban on non-consensual DNA testing and the country has the largest criminal DNA database (7% of the population), which has facilitated some high-profile criminal convictions but also rightly calls for tighter regulation. The German legislation also allows testing for criminal investigation.

If the debate reaches a stalemate in the Bundestag, the impasse might be resolved by postponing legislation on the prenatal clauses. Failure to introduce any legislation on genetic testing would leave the country vulnerable to some of the excesses seen in the USA. Critics are advised not to throw out the baby with the bath water.

## Focus on host subversion

**A collection of seven reviews surveys how microorganisms subvert host cell biology.**

Viruses must infect cells to complete the intracellular phase of their life cycle. They have evolved a broad palette of ingenious mechanisms to exploit host cell biology, using the host's metabolic and regulatory pathways to facilitate their proliferation while providing a niche to evade immune detection. A number of parasitic bacteria and eukaryotes have evolved similar strategies. Understanding the cellular mechanisms targeted by microorganisms is essential to achieving therapeutic inroads against diseases ranging from global epidemics, such as AIDS and malaria, to persistent public health problems, such as *Salmonella* and *Chlamydia* infections.

The concept of targeting host pathways co-opted by a microorganism—as yet underexploited—may allow for the development of more effective antimicrobials that are not subject to the emergence of drug resistance due to mutation of the evolutionary less constrained microbial drug targets. Since the biology of commensal microorganisms, which live in symbiotic harmony with their host and play important roles in its metabolism and immune modulation, overlaps with that of pathogenic microorganisms, therapeutic intervention must consider these side effects.

The study of cellular pathways used by microorganisms has yielded many insights into eukaryotic biology; for example, studies of retroviruses laid the foundation for molecular cancer research thirty-three years ago (marked by the 1989 Nobel prize). To take stock of this rapidly progressing field, *NCB* has teamed up with *Nature Reviews Microbiology* to commission a series of seven review articles entitled 'Microbial host cell subversion'. With a topic of such breadth, the aim is not to provide an encyclopaedic overview, but rather an in-depth analysis of cutting edge research on selected topics that exemplify key concepts.

In this journal, Mercer and Helenius review a new key mode of viral entry, macropinocytosis, and Randow and Lehner provide an overview of how viruses make use of their host's ubiquitin system to evade immune responses. Brodsky and Medzhitov compare acute and persistent pathogens, and how they respectively disrupt or manipulate the host immune signalling pathways.

In *Nature Reviews Microbiology*, Tang and colleagues review how certain bacteria are able to reside in the host cell cytosol where they obtain nutrients for growth and avoid host immune responses. Grinstein and colleagues discuss how bacteria enter host cells through phagocytosis and the mechanisms that they use to counteract host cell defences, and Lora Hooper asks how the commensal bacteria that form the all important gut flora interact with intestinal epithelia to maintain a stable niche. Tilley and colleagues review the remodelling of host red blood cells triggered by the more than one hundred known secreted effectors of malaria parasites.

An accompanying web focus draws together relevant recent primary and review papers from across the *Nature* family of journals. We hope this collection will stimulate microbiologists and cell biologists alike to engage in collaborative projects to expand our understanding of how microbes and host cells interact. Apart from the intellectual excitement of mapping complex interactions across the phylogenetic tree, such research continues to have important health and biotechnology implications.