Epidemic Pseudomonas aeruginosa strain sequenced

Researchers have sequenced the genome of a virulent, transmissible strain of *Pseudomonas aeruginosa*. Craig Winstanley (University of Liverpool, UK) and colleagues report that LESB58, the earliest archived isolate of the Liverpool epidemic strain, contains six prophages and five other genomic islands. Mutagenesis experiments suggest that several genes in these regions contribute to the in-vivo competitiveness of the epidemic strain.

*P. aeruginosa* is the commonest cause of persistent, fatal respiratory infections in patients with cystic fibrosis (CF). “Until about 10 years ago”, explains Winstanley, “we thought that patients always acquired bacteria from the environment.” Then, in the mid 1990s, a single transmissible *P. aeruginosa* strain caused an increase in antibiotic-resistant infections in the children’s CF unit at the Alder Hey Hospital in Liverpool. “The Liverpool epidemic strain is now the most common single *P. aeruginosa* strain in CF units in England and Wales”, says Winstanley, “and its emergence has led to changes in infection control policies in CF units.”

To uncover genetic clues to the epidemic strain’s success, Winstanley’s team sequenced the genome of LESB58, which was obtained from a patient in Liverpool in 1988. They report that, like other *P. aeruginosa* strains, LESB58 has a highly conserved core genome that represents about 90% of the total genomic sequence. The remaining, variable 10%, says Winstanley, contains several large genomic islands and prophages. The researchers then introduced mutations into the LESB58 genome and tested the ability of the mutant bacteria to compete against wild-type bacteria in a rat model of chronic lung infection. Their analysis shows that four genes, present in three prophages and a newly discovered genomic island, contribute to the in vivo competitiveness of LES.

“This is a valuable piece of work”, comments CF microbiology expert Tyrone Pitt (Health Protection Agency, London, UK), “as it gives us the full genomic make-up of the Liverpool epidemic strain.” But, warn Pitt and Winstanley, although this research identifies putative genes that may be involved in the transmissibility and persistence of this strain, their regulation and function will have to be elucidated before new strategies for the management of CF can be developed.

Jane Bradbury

USA failing on HIV/AIDS accountability and action

When inaugurated as the new US President on Jan 20, Barack Obama faces calls that the USA is failing in leadership, accountability, and transparency on HIV/AIDS. But the USA is one of many countries failing to report essential data on the epidemic according to a new scorecard developed by AIDS Accountability International (AAI).

“There has never been an independent rating mechanism to hold governments accountable for targets,” says Rodrigo Garay, AAI’s executive director. 100 policy makers and activists took 2 years of consultation and analysis to develop the UNAIDS endorsed scorecard, which uses data reported by 190 countries, and rates eight elements: data collection, focus on most at-risk populations, treatment, prevention, coordination, civil-society involvement, financing, and human rights.

Many gaps exist in the data—US reporting, for example, was described as “appalling”. The hope is that global agencies, governments, donors, scientists, and civil society will use the data to develop more effective programmes by learning from other countries. In 2009, AAI will expand its expert panel to 1000 diverse experts, roll out an advocacy collaboration with the World AIDS Campaign for advocacy, further develop the scorecard, develop data validation, and increase dialogue with “state actors”.

The USA was also criticised for lack of action on HIV testing at a 2008 summit sponsored by the Forum for Collaborative HIV Research. Despite Centers for Disease Control and Prevention (CDC) guidelines for HIV testing, people in emergency rooms, those privately insured with symptoms of HIV or seeking sexual health screens, and prisoners, are among those potentially missing out on early diagnosis and thus treatment. “Since the release of the CDC recommendations in 2006, many model programmes have shown us what is possible”, says the Forum’s director Veronica Miller. “The New York City hospital system—the largest in the country—tripled the number of people tested and more than doubled the number identified with HIV. It’s time to move from demonstration projects to implementation at the national level.” Miller advocates a national AIDS strategy, with routine testing as a crucial component.

WHO recently published modelling data in *The Lancet* that suggest annual, universal, voluntary HIV testing followed by immediate antiretroviral therapy (irrespective of clinical stage or CD4 count) could reduce new cases by 95% in 10 years. However, Lesotho, one of the first countries to implement universal testing, has failed to fulfil its programme goals and has not safeguarded human rights, notes a report by Human Rights Watch and the AIDS and Rights Alliance for Southern Africa.

Kelly Morris