

Genetic discovery will help fight diarrhea outbreaks

June 13 2012

Researchers at the University of East Anglia (UEA) have discovered unexpectedly large genetic differences between two similar species of the pathogenic *Cryptosporidium* parasite.

Published today in the journal *Evolutionary Applications*, the findings pave the way for a new gold standard test to distinguish between the waterborne parasite's two main species affecting humans. One species is spread from person to person (*Cryptosporidium hominis*) but the other is often spread from livestock to people (*Cryptosporidium parvum*).

"Being able to discriminate quickly between the two species means it is easier to spot an outbreak as it develops, trace the original source, and take appropriate urgent action to prevent further spread," said lead author Dr Kevin Tyler of Norwich Medical School at UEA.

Cryptosporidium is a [protozoan parasite](#) that causes outbreaks of diarrhoea across the globe. In the UK, around two per cent of cases of diarrhoea are caused by the organism and many people will be infected at some time in their lives. Symptoms include watery [diarrhoea](#), [stomach pain](#), [nausea and vomiting](#) and can last for up to a month, but healthy people usually make a full recovery.

However, in the developing world infection can be serious in [malnourished children](#) and a significant cause of death in areas with high prevalence of untreated AIDS.

In the UK, outbreaks have been caused by faulty filtration systems in water supplies and transmission through [swimming pools](#) because the parasite is not killed by chlorine disinfection. Outbreaks also occur at open farms and in nurseries. People can also be infected by eating vegetables that have been washed in contaminated water. Hygiene is important in the prevention of spread of *Cryptosporidium*: people are advised to always wash their hands with warm running water and soap after touching animals, going to the toilet, changing nappies and before preparing, handling or eating food.

In this EU-funded study, the researchers identified the first parasite proteins that are specific to the different species. They found them at the ends of the chromosomes where they had been missed during previous parasite genetic studies.

Dr Tyler said: "Our discovery is an important advance in developing new simple and reliable tests for identifying these two species of parasite. This is the first step in discriminating outbreaks from sporadic cases, local strains from exotic ones, and tracing the source of outbreaks to an individual water supply, swimming pool or farm."

The UEA team worked with colleagues at the UK *Cryptosporidium* Reference Unit in Swansea, and Barts and the London School of Medicine and Dentistry, part of Queen Mary, University of London. Recently obtained renewed funding from the EU will enable further development towards a diagnostic test for use in the water industry and public health.

More information: 'A new heterogeneous group of telomericly encoded *Cryptosporidium* proteins' by M Bouzid (UEA), P Hunter (UEA), V McDonald (Barts and London School of Medicine and Dentistry), K Elwin (Public Health Wales), R Chalmers (Public Health Wales) and K Tyler (UEA) is published on Thursday June 14 by

Evolutionary Applications and will be available to download here:
[onlinelibrary.wiley.com/journal/1111/\(ISSN\)1752-4571](https://onlinelibrary.wiley.com/journal/1111/(ISSN)1752-4571)

Provided by University of East Anglia

Citation: Genetic discovery will help fight diarrhea outbreaks (2012, June 13) retrieved 11 May 2024 from <https://medicalxpress.com/news/2012-06-genetic-discovery-diarrhea-outbreaks.html>

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