

Mystery *E. coli* genes essential for survival of many species

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Scientists have shown that *E. coli* - one of the best known and extensively studied organisms in the world - remains an enigma that may hold the key to human diseases, such as cancer.

The team, funded by the [Biotechnology](#) and Biological Sciences Research Council (BBSRC) and based at the University of Dundee has examined the [genome sequence](#) of this workhorse of the laboratory and spotted three previously unknown genes that, it turns out, are essential for the survival of *E. coli* and one out of the three could also be implicated in cancer or developmental abnormalities in humans. These mystery genes are also found in numerous other creatures, suggesting a vital role for them across many species. The research will be published in the 1 August edition of the *Journal of Bacteriology*.

The effort over recent years to sequence genomes of various important species has uncovered many previously unknown genes. This has given scientists the opportunity to choose to study these genes now, rather than waiting for them to make themselves known serendipitously e.g. when they are implicated in disease. Professor Tracy Palmer and her colleagues have taken three genes identified through sequencing of the *E. coli* genome and studied them to discover their significance.

Professor Palmer said: "Scientists have been studying *E. coli* genes for many, many years and we thought we knew pretty much all there was to know - we certainly didn't expect to find any more genes that are essential for survival!"

"Finding out that these genes are essential in *E. coli* and also appear in the genomes of other species tells us that they are very important indeed. In the case of one of the genes it is also found in the human genome, which makes it especially interesting. The mystery remains as to what they actually do, but whatever it is, it must be really crucial.

"Because we now know that one of these genes is found in humans as well, we might be looking at something that is really important in our development or that might cause disease."

Early indications from Professor Palmer's work suggest that the genes, named *yjeE*, *yeaZ* and *ygjD* could be involved in cell division. *ygjD* is present in the human genome and also appears to be the key player of the three genes found in *E. coli*.

Professor Palmer continued: "We've done experiments that show these genes affect how *E. coli* cells respond to different messages that tell them when to divide. If they do the same thing in humans then any problems with these genes could easily lead to developmental abnormalities or cancer."

Professor Douglas Kell, BBSRC Chief Executive said: "This work is a good example of where having a genome sequence opens up many possible avenues of enquiry. It also makes clear the value of an organised approach to accessing and using genome information. Research focussed on maximising the use of genome sequences will surely, therefore, accelerate discovery of information that is of social and economic importance. BBSRC has committed to such activity through the launch of our new [Genome](#) Analysis Centre earlier this month."

Source: Biotechnology and Biological Sciences Research Council ([news : web](#))

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