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For immediate release

Bangladeshi scientist makes breakthrough in understanding how cholera bacteria become deadly

Dr. Shah M. Faruque, Head of Molecular Genetics at ICDDR,B (International Centre for Diarrhoeal Diseases Research, Bangladesh) and his research team have discovered how a harmless bacteria can become the cause of many cases of the severe form of diarrhoea known as cholera. This disease kills hundreds of thousands of people a year, mainly in poorer parts of the world. This important breakthrough will have far reaching implications globally in predicting when new types of the cholera-causing bacteria, called *Vibrio cholerae* will next appear and start infecting people, and causing them to fall ill.

The findings published in *Nature*, the internationally acclaimed science journal that publishes outstanding discoveries, were the work of Dr. Shah M. Faruque and his Dhaka-based research team, in collaboration with Dr. John Mekalanos of Harvard Medical School in Boston. "ICDDR,B is dedicated to saving lives through treatment and research", said Dr. Alejandro Cravioto, the organization's Executive Director. "The publication of these findings in a journal like *Nature* shows not only the quality of our research, but how we are producing new science that can help explain diseases and more importantly how they can be prevented."

The new research explains how bacteria become infected with their own viruses and how these viruses interact to allow the bacteria to produce substances that interact with the intestinal cells to make them produce the large quantities of water and electrolytes known as diarrhoea. Although some of these mechanisms are already known, the work of Dr. Faruque and his collaborators advances the understanding of how these different viruses interact to make the bacteria a more effective pathogen. The new phage identified, called the "TLC phage" adds a new piece to the puzzle on how the bacteria get information they need from the environment to use it to live in difficult environments like the human intestine.

"We discovered and characterized the "TLC phage" which changes, albeit slightly, the chromosomal sequence of the cholera bacterium," said Dr. Faruque. "This subtle change enables an incoming toxigenic CTX phage genome to be incorporated and in doing so a harmless strain of *V. cholerae* is transformed in to a dangerous killer." The World Health Organization (WHO) estimates that cholera kills more than 100,000 people every year, and infects more than a million. Recent epidemics in sub-Saharan African countries like Zimbabwe and Mozambique and more recently in the flooded areas of Pakistan highlight the continuing threat of cholera and the need for studies like ICDDR,B's for a better understanding of the disease and its capacity to transmit in the environment. "We hope that our knowledge will help save lives and have far reaching implications in public health research" said Dr. Faruque.

Notes to editor:

Article can be found online at:

<http://www.nature.com/nature/journal/vaop/ncurrent/full/nature09469.html>

ICDDR,B, the International Centre for Diarrhoeal Disease Research, Bangladesh is a leading international health research institution located in Dhaka. In collaboration with academic and research institutions throughout the world ICDDR,B conducts research and training to develop and share knowledge which address some of the most critical health concerns facing the world today. It translates this knowledge in its Dhaka Hospital which treats more than 120,000 patients a year. In the past decade the hospital has treated more than a million patients with diarrhoeal disease, 300,000 of whom would have died without treatment.

Dr. Shah M. Faruque is a Senior Scientist and Head of Molecular Genetics at the ICDDR,B. Dr. Faruque was awarded Ph.D. in Molecular Biology by the University of Reading in the United Kingdom in 1988. He was a Commonwealth Scholar in the UK. Dr. Faruque is a Fellow of the Academy of Sciences for the Developing World, as well as a Fellow of the Bangladesh Academy of Sciences. In recognition of his outstanding contributions to the understanding of natural phenomena associated with the dynamics of cholera epidemics, he was awarded the TWAS Prize-2005 in Medical Sciences, by the Academy of Sciences for the Developing World. Dr. Faruque conducts research in collaboration with scientists from different countries and Institutes in India, Japan, Thailand, Sweden, UK, and the USA.

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