New age of discovery for new proteins dawns

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(PhysOrg.com) -- We are on the brink of another new age of discovery- this time of countless new proteins, which could be used in a whole range of situations from medicine to industry, following the successful development of a new laboratory technique.

The new technique, a reactome array, is set to transform microbiological research. It is described for the first time today in the internationally prestigious journal *Science* (9.10.09) in a paper co-authored by Professor Peter Golyshin of Bangor University, along with research colleagues at universities in Spain and Germany.

The new technique pinpoints biochemical activity (metabolism) and energy exchange within the cell and identifies active proteins in individual microbes or communities of microbes, from any environment.

It bridges a gap between an ever increasing genome or DNA sequencing dataset and understanding the specific functions of the genes.

"The last 15 years have seen dramatic strides in our knowledge through the development of DNA sequencing. This approach can provide a blueprint for the entire genetic make up of a single microbe or complex microbial communities. We can easily describe and catalogue the elements that make the DNA sequence, that is, the genes. To identify their function, they usually have to be compared to existing databases of known gene function. In a sense, what currently happens is a comparison against already known genes and proteins.

Reactome Array takes a wholly different approach. The technique identifies the whole set of biochemical reactions and, importantly, captures and identifies the proteins actively involved in the cell's metabolism or energy exchange," explains Professor Peter Golyshin, Professor of Environmental Genomics at Bangor University.

As well as enabling us to have a better understanding of how the world around us functions at a microbial level, these yet to be discovered proteins could have applications in a whole range of situations from medicine or pharmaceuticals to industry to environmental control, from the development of cost effective medical diagnostic kits for particular diseases to the mining of interesting proteins from unusual and extreme microbial habitats where one could anticipate novel proteins for use in food production, cosmetics, agriculture and other industries.

More information: Reactome Array: Forging a Link Between Metabolome and Genome is published in *Science*, issue 9 October 2009

Provided by Bangor University (news : web)