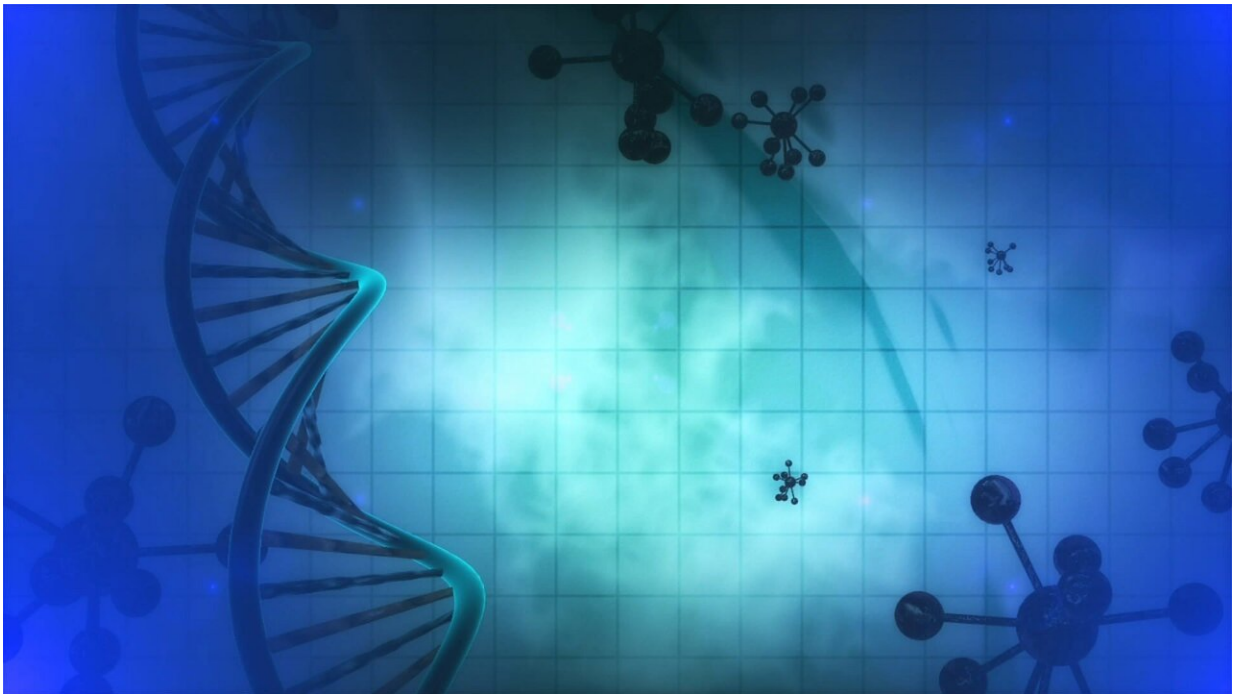


Determining gene function will help understanding of processes of life

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Scientists at the University of Kent have developed a new method of determining gene function in a breakthrough that could have major implications for our understanding of the processes of life.

A team at the University's School of Biosciences developed a novel computational approach which enabled them to assign functions to [genes](#)

which hitherto had unknown function.

One approach to improve understanding of the basic features and requirements of life is to generate organisms with a minimal genome, i.e. the smallest number of genes that enable life.

Dr. Mark Wass, Professor Martin Michaelis and Magdalena Antczak studied the organism with the smallest genome generated so far, based on a bacterium (*Mycoplasma mycoides*) that is cultivated in a nutrient-rich environment. It contains 473 genes, nearly one-third (149) of which have an unknown function, illustrating the limitations of our current understanding of how life works.

The Kent researchers developed a novel [computational approach](#) which enabled them to assign functions to 66 of the genes of unknown function. They found that many of the encoded functions have a role in substance transport into and out of the cell.

Dr. Wass said: 'This seems to reflect the requirements of an organism with a minimal genome in a nutrient-rich environment. If nutrition is available in abundance, many genes performing metabolic functions are not needed, but transporters that enable nutrient transport into the cell and the excretion of (toxic) metabolites out of the cell become critical.

'This indicates that there is not one minimal genome but that the nature of a minimal genome will always be shaped by the environment. Consequently, a minimal genome consists of a set of essential genes, which are indispensable for all forms of life, and a second set of facilitator genes, which enable life in a certain [environment](#).'

The team say that their findings should pave the way to more focused research on the identification of essential and facilitator gene sets to advance the understanding of the fundamental processes of [life](#).

More information: M.Wass, M. Michaelis and M. Antczak,
Environmental conditions shape the nature of a minimal bacterial
genome. *Nature Communications* [DOI: 10.1038/s41467-019-10837-2](https://doi.org/10.1038/s41467-019-10837-2)

Provided by University of Kent

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