Research suggests that evolution sometimes meant becoming simpler, not more complex

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Adult sponge, Amphimedon queenslandica.

(Phys.org)—The view that animals have become more complex over time could be a thing of the past, according to the latest research.

The new evidence, from scientists at the University of St Andrews, suggests that some modern day animals may have evolved instead by becoming less complex.

The researchers say that the discovery, of ghostly remains of gene neighbourhoods that once existed in a 550 million year old ancestor, suggests that the earliest animal was more complex than previously thought.

The findings, published later today in the journal, Current Biology, appear to contradict the common perception of evolution – that creatures have advanced by becoming genetically more complex over time.

Researchers, led by Dr David Ferrier of The Scottish Oceans Institute at the University of St Andrews, found that some modern-day animals like sponges, comb jellies and placozoans (a flat, splodge of an animal with no head, tail, gut or limbs) may have actually evolved by losing some genes and perhaps became simplified from a more complex ancestor, from which the entire animal kingdom evolved.

Dr Ferrier and his team studied key genes, known as Hox and ParaHox, which are renowned for building the bodies of nearly all modern-day animals. They control where ribs develop in humans or where wings develop in flies, and can be disrupted in diseases such as cancer and diabetes.

Until this latest research, scientists had argued over whether these genes evolved in a step-wise fashion, during early animal evolution, or instead were present in the very first animals.

Dr Ferrier explained, "The conventionally accepted view was that these genes were interlinked with the increasing complexity of animals as the earliest animal ancestors were succeeded by more advanced creatures, with a greater diversity of different cell types and a greater range of genes that build this gradual increase in complexity."

By comparing the genomes of animals like humans and sea anemones,

the St Andrews' researchers could reconstruct the 'neighbourhoods' that surrounded the Hox and ParaHox genes in the ancestor of these animals, even though this ancestor lived (and died) more than 550 million years ago.

These researchers found that some animals, like sponges and placozoans, which evolved earlier than sea anemones and humans, still have these neighbourhoods, even though they do not actually contain the Hox and ParaHox genes themselves.

Dr Ferrier continued, "These neighbourhoods are like ghosts in these genomes, providing a faint representation of what existed previously, with the Hox and ParaHox genes having died and disappeared, but leaving a ghostly outline behind.

"Our work provides a completely different view to the consensus that had developed over recent years about the very first animal ancestor.

"This new approach, which reveals the ancient origin of these important developmental control genes, means the hunt for these genes in early animal lineages is now back on."

Provided by University of St Andrews

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