

Unicellular microRNA discovery

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In the May 15th issue of *Genes & Development*, an international collaboration of researchers, led by Dr. Yijun Qi (National Institute of Biological Sciences, China), report on their discovery of microRNAs in the unicellular green alga, *Chlamydomonas reinhardtii*. This is the first finding of microRNAs in a unicellular organism.

"The finding changes the dogma that miRNAs only exist in multicellular organisms, and adds an important piece into the blooming small RNA world. A pressing question we have now is what these miRNAs are exactly doing in the green alga. I hope we will know the answers soon," says Dr. Qi.

MicroRNAs (miRNAs) are a class of conserved, approximately 21-nucleotide long RNAs that regulate the expression of genes by either cleaving complementary mRNA targets or repressing their translation. MiRNAs have been identified in both plants and animals, acting as key regulators of multicellular development.

Dr. Qi and colleagues now extend the range of miRNAs into unicellular organisms, with their discovery of a large number of miRNAs in green algae. The researchers showed that unicellular miRNAs share functional characteristics with plants miRNAs, in so far as they can direct the cleavage of target mRNAs in vitro and in vivo. Furthermore, they found that miRNA expression patterns changed during gamete differentiation, suggesting a possible role in regulating sexual reproduction.

The discovery of miRNAs in a unicellular organism has evolutionary

implications as well. While the existence of miRNAs in unicellular and multicellular organisms suggests that the miRNA pathway arose before these lineages split, the lack of universally conserved miRNA genes in algae, plants and animals suggests that they may have evolved independently.

Source: Cold Spring Harbor Laboratory

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