

Gene decides whether coral relative will fuse or fight

March 19 2009

When coral colonies meet one another on the reef, they have two options: merge into a single colony or reject each other and aggressively compete for space. Now, a report in the March 19th *Current Biology*, a Cell Press publication, has found a gene that may help to decide that fate.

"We have identified a gene that controls how a colonial animal recognizes a member of its own species based on cell-cell contact," said Leo Buss of Yale University. "The ability to recognize individuals implies a capacity to categorize such encounters and, in this case, it allows colonies to discriminate between those individuals with which they will fuse or fight."

The researchers made their discovery by studying a colonial [cnidarian](#) called *Hydractinia symbiolongicarpus* in the laboratory. (Cnidarians are most familiarly represented by corals, sea anemones and jellyfish.) Perhaps best known to [Atlantic basin](#) and western Pacific beachcombers as the distinctive white fuzz growing on the top of hermit crab shells, *Hydractinia* have become a model for scientific exploration of such so-called allorecognition phenomena, which define self versus non-self.

Despite the ubiquity of allorecognition in colonial organisms and its ecological and evolutionary importance, its molecular basis had not been thoroughly defined. Such interactions in nature are also of interest because of their resemblance to those that occur in pregnancy and following organ transplantation.

Now, Buss, Stephen Dellaporta and their interdisciplinary colleagues have identified a key invertebrate allorecognition gene. The gene they identified appears to encode a transmembrane receptor expressed in all tissues capable of allorecognition. It also includes a hypervariable domain and exists in many different varieties that predict how *Hydractinia* colonies will interact with one another, they show. The gene sequence is most closely related to the [immunoglobulin \(Ig\)](#) superfamily of proteins, which include antibodies of the [mammalian immune system](#).

"Relationships have often been suggested between cnidarian and protochordate allorecognition systems or between invertebrate allorecognition systems and elements of the vertebrate immune system..." the researchers wrote. However, while Ig-like domains are found in vertebrate immune molecules and potentially also in the *Hydractinia* allorecognition gene, there appears to be no additional similarity between the known surface molecules in these systems.

"Indeed," they concluded, "growing evidence suggests that animals have evolved a variety of unique molecular mechanisms to distinguish self from non-self, including the MHC in vertebrates, VCBPs in protochordates, VLR immune molecules in jawless fish, FREP proteins in molluscs, and the FuHC in tunicates. We can now add the *Hydractinia* allorecognition system to this diversity."

Source: Cell Press ([news](#) : [web](#))

Citation: Gene decides whether coral relative will fuse or fight (2009, March 19) retrieved 26 April 2024 from <https://phys.org/news/2009-03-gene-coral-relative-fuse.html>

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