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ECOLOGY TODAY

## Division of Labor Offers Insight into the Evolution of Multicellular Life

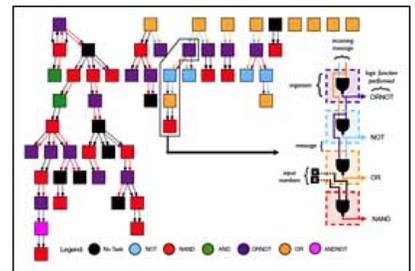
By Guest, August 7, 2012

Dividing tasks among different individuals is a more efficient way to get things done, whether you are an ant, a honeybee or a human.

A new study by researchers at Michigan State University's BEACON Center for the Study of Evolution in Action suggests that this efficiency may also explain a key transition in evolutionary history, from single-celled to multi-celled organisms.

The results, which can be found in the current issue of the *Proceedings of the National Academy of Sciences*, demonstrate that the cost of switching between different tasks gives rise to the evolution of division of labor in digital organisms. In human economies, these costs could be the mental shift or the travel time required to change from activity to another.

Using the digital evolution platform Avida, self-replicating computer programs, a the team imposed a time cost on the organisms that had to perform different computational tasks to get rewards, said Heather Goldsby,



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of a community was genetically identical, in the same way that all of the cells in a human body contain the same genetic material. Instead, the organisms had to have flexible behavior and a communication system that allowed them to coordinate tasks.

The most surprising result was that the organisms evolved to become dependent on each other.

“The organisms started expecting each other to be there, and we tested them in isolation, they could no longer make copies of themselves,” said Charles Ofria, MSU associate professor of computer science and engineering.

Ben Kerr at the University of Washington and Ann Dornhaus with the University of Arizona contributed to this study. The research was funded by the National Science Foundation.

Source: *Michigan State University*

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