

COLLOQUIUM

Cooperation: The Third Pillar of Evolution

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May 04, 2016

4:00 p.m. - Wilson Hall, One West

Cooperation implies that one individual pays a cost for another to receive a benefit. Cooperation can be at variance with natural selection. Why should you help competitors? Yet cooperation is abundant in nature and an important component of all great evolutionary innovations. Cooperation can be seen as the master architect of evolution, as the third fundamental principle of evolution beside mutation and selection. I will present five mechanisms for the evolution of cooperation: direct reciprocity, indirect reciprocity, spatial selection, group selection and kin selection. Direct reciprocity means there are repeated interactions between the same two individuals and my behavior towards you depends on what you have done to me. Indirect reciprocity means there are repeated interactions within a group and my behavior towards you also depends on what you have done to others. Indirect reciprocity is the key mechanism for understanding pro-social behavior in humans and has provided the right selection pressure for the emergence of social intelligence and human language. Cooperation on a global scale is needed for the stability of intelligent life on earth.