

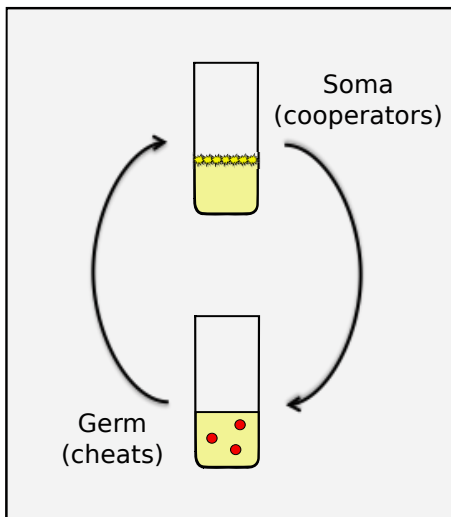


## Experimental evolution of individuality

Thursday 19 July 2012 1pm

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Gould Seminar Room (Room 235) Gould building, 116 Daley Road, ANU



Evolutionary transitions in Darwinian individuality are central to the emergence of biological complexity. During the transition from single cells to multicellular life, populations of cells acquired the capacity for collective reproduction; however, the selective causes and underlying mechanisms are unclear.

I will describe an experiment in which we witness the emergence of Darwinian individuality in populations of cooperating bacteria subjected to a selective regime that rewards collective-level fecundity. Central to collective reproductive success is a primitive life cycle that is fueled by conflict between cooperators and cheats. Enhanced fitness of derived collectives is attributable to a property selected at the collective-level, namely, the capacity to transition through phases of a life cycle, and is not explained by improvement in individual cell fitness. Indeed, the fitness of individual cells declined.

The experiment provides a simple mechanism for the evolution of collective-level reproduction and shows this innovation to be sufficient for the decoupling of lower- and higher-level fitness as is anticipated during a transition in individuality.

Presented by

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