# Explaining the emergence of a global order out of biosphere-environment interactions: a critical appraisal of the Ga'ia hypothesis theoretical foundations.

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## Abstract

"Session: Explaining adaptation: Organism/environment interactions accross time and spatial scales (Dutreuil, Pocheville, Turner)"

The Ga'ia hypothesis (GH), proposed by Lovelock and Margulis (1974) is interested in three related points: (i) the influence that the sum of all living organisms have on their environment at a global scale, (ii) the eventual benefit that they could gain by influencing their environment, namely, a "regulation" or so called "homeostasis" of the environment, which led Lovelock (1979) to suggest, (iii), to compare the biosphere/Earth to an organism.

Based on the fact that Earth/the biosphere does not reproduce and therefore cannot undergo natural selection, Dawkins (1982) famously dismissed (ii) as theoretically problematic and (iii) as an illegitimate analogy. He was henceforward followed by all evolutionary biologists and philosophers of biology, with scarce exceptions. Nonetheless, a small community of scientists has since made important and various theoretical suggestions to account for the existence of a "regulation" of the global environment without genuine natural selection occurring at the global scale.

The aim ot this presentation is threefold: first to clarify the explanda of GH, second to critically assess the theoretical elaborations that have been made since 1982, three to enlarge the scope to other later suggestions (extended phenotype, niche construction, extended organism) that seem to bear theoretical similarities to GH so as to evaluate their effective resemblance.

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