Organizational requirements for 'open-ended evolution'

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In this contribution we will review different conceptions of open-ended evolution and propose our own (Ruiz-Mirazo et al., 2008, Biol. & Philos., 23, p.67). Then, we will consider what are the general conditions that would allow such an evolutionary process to take place, with a specific focus on the type of organization that the systems involved should have. It will be argued that a strong 'dynamic decoupling' is necessary, making possible the long-term maintenance of those systems, in which the individual (self-constructing) and collective (ecological and historical) spheres become deeply intertwined. Particular attention in the discussion will be given to bottleneck cases, like a hypothetical prebiotic 'RNA-world', which –according to our account– would not meet all the requirements. We will also reason why the evolution of a prokaryote world is already open-ended, even if the transition to higher levels of complexity (eukaryotes, multicellular organisms, cognitive agents,) would imply further organizational bottlenecks and the fulfilment of additional conditions.