Cellular Dynamics at the beginning of Prebiotic World

Walter Riofrio
Complex Thought Institute Edgar Morin, University Ricardo Palma
Institut des Systèmes Complexes – Paris Île-de-France (ISC-PIF)
walter.riofrio@iscpif.fr

It seems that the emergence of cellular dynamic structures were more feasible than previously though. From the results of recent studies, it is likely that in the origins of prebiotic world the appearance of protocells came first. Although unknown the molecular composition of ancient protocells, the rationale of its dynamic self-organization should lead us to some revealing characteristics (which are still present and complexified in living systems). There could be the characteristics we could discern by the way these dynamic entities began to self-organize. If it is possible to contend the existence of two very interconnected processes behaving as the first prebiotic constraints: (1) a container made of amphiphilic molecules and (2) a micro cycle, driving the protocell far away from thermodynamic equilibrium. Then, this last self-constraint causes a change in the system’s free energy ($\Delta G_{sys}$), i.e. a trend towards negative values, and turned into an unavoidable checkpoint along the pathway of creating a future set of responses that are generated in another part of the interconnected and interdependent processing network. In consequence, it had provided the conditions for the emergence of the first small world structures as core characteristics to the way in which the biological realm computes.
Bibliography


