

Topics in Biophysics
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Assignment 1, October 8, 2006

This assignment is due by Monday October 30th at the beginning of class.

Transitions during the evolution of early life on Earth

The origin of life-forms on Earth remains a profound mystery. At least three major transitions can be identified: 1) the emergence of proteins from a soup of self-replicating RNA molecules, 2) the emergence of DNA as the sole information carrier, and 3) the emergence of membrane-encased proto-cells.

Choose one of these transitions and discuss the rationale for believing this transition to have been essential, and give supporting or negating arguments for the manner in which this transition is believed to have occurred. Your arguments can be either very broad, or else focused on a specific aspect of the biophysical/biochemical interactions at play during these transitions.

Your arguments should be given substance from a literature survey and quantitative arguments (including computer simulations or mathematical analysis).

The final report should be at least 10 pages in length (1 ½ spacing) including all figures and references. One of the major goals of this assignment is to give you experience in working with others on a research project. Aim to be collaborative and inclusive. If your team agrees that each member contributed equally, please list authors in alphabetical order and explicitly state that all members did contribute equally. If this does not apply, the author list should include the percentage effort of members of the team. An individual grade will assigned to each member of the team in this case.

Good luck with your investigations – and start early!