

Proteins – from so simple a begging

Dan S. Tawfik. Department of Biomolecular Sciences, Weizmann Institute of Science, Rehovot, 76100, Israel; E-mail: dan.tawfik@weizmann.ac.il.

Proteins are essential to life. These large, immensely complex molecules perform multiple tasks with high speed and accuracy. However, the complexity of current proteins presents a puzzle – how did these molecules evolve in the first place?

I will describe some insights regarding how new proteins functions evolve, via gradual, small changes in sequence. However, the mechanisms of such evolutionary *micro*-transitions do not explain *macro* evolutionary transitions – how completely new proteins emerge, let alone how the very first protein(s) evolve. I will therefore also present our recent findings with respect to the *de novo* emergence of functional, globular proteins.