Structure-function relationships revisited

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A fundamental assumption in classical biochemistry and molecular biology is that of the importance or even primacy of structure-function relationships at the level of material units. By this approach, characterization of molecular structure is the point of departure for questions such as: What is the function of this macromolecule? How can the function be explained by its structure?

From a conventional systems-theoretical perspective one would insist on a more sophisticated analysis of function, while typically maintaining a structural and material definition of units. Theories of delocalisation and network theories might offer points of a more radical departure from material analysis; Robert Rosen's attempt at a relational biology may be another such point.

Still, Rosen and most other leading systems theorists did not undertake any critical epistemological analysis of their own theories and research programmes, understanding their own endeavours reflexively in a systems perspective. This has implications for debates on systems-theoretical issues such as reductionism and emergentism. Indeed, in this workshop contribution I shall try to outline what is at stake in these debates and address the context sensitivity of choice of theoretical perspective when studying life.