Biological Systems as Reactive Systems

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Systems Biology is a new discipline aiming to understand the behavior of biological systems as it results from the (non-trivial, "emergent") interaction of biological components. We discuss some biological networks that are characterized by simple components, but by complex interactions. The components are separately described in stochastic pi-calculus, which is a "programming language" that should scale up to description of large systems. The components are then wired together, and their interactions are studied by stochastic simulation. Subtle and unexpected behavior emerges even from simple circuits, and yet stable behavior emerges too, giving some hints about what may be critical and what may be irrelevant in the organization of biological networks

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