1125-92-508   **Mitchell J Eithun*** (`eithunm@ripon.edu`) and **Anne Shiu** (`annejls@math.tamu.edu`). *An All-Encompassing Global Convergence Result for Processive Multisite Phosphorylation Systems.*

Phosphorylation, the enzyme-mediated addition of a phosphate group to a molecule, is a ubiquitous chemical mechanism in biology. Multisite phosphorylation, the addition of phosphate groups to multiple sites of a single molecule, may be distributive or processive. Distributive systems can be bistable, while processive systems were recently shown to be globally stable. However, this global convergence result was proven only for a specific mechanism of processive phosphorylation/dephosphorylation (namely, all catalytic reactions are reversible). Accordingly, we generalize this result to allow for processive phosphorylation networks in which each reaction may be irreversible, and also to account for possible product inhibition. We accomplish this by defining an all-encompassing processive network that encapsulates all of these schemes, and then appealing to recent results of Marcondes de Freitas, Wiuf, and Feliu that assert global convergence by way of monontone systems theory and network/graph reductions (which correspond to removal of intermediate complexes). Our results form a case study into the question of when global convergence is preserved when reactions and/or intermediate complexes are added to or removed from a network. (Received September 04, 2016)

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