Mathematical Properties Of Stoichiometric Matrices

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Project Goals: Characterise the mathematical properties of stoichiometric matrices and decompose a biochemical network into a set of moiety subnetworks.

Abstract Characterising biochemical network structure in mathematical terms is a fundamental component of mathematical biology. It enables the inference of functional biochemical consequences from network structure with existing mathematical techniques and spurs the development of new mathematical techniques that exploit the peculiarities of biochemical network structure [1, 2]. The structure of a biochemical network is specified by reaction stoichiometry, that is, the relative quantities of molecular species produced and consumed in each chemical reaction of a network. The stoichiometry for the set of reactions in a network can then be compiled into a stoichiometric matrix, where every row corresponds to a molecular species and every column corresponds to a reaction. Herein, we summarise the main mathematical properties of stoichiometric matrices and emphasise those that distinguish them from arbitrary rectangular matrices.

References

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