

## **How Patterns in Data Help Us to Understand Biological Complexity**

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One of the biggest challenges in the Life Sciences is the interpretation of high-throughput ('omics') data. Using the example of bacterial gene regulation, we illustrate, how patterns in 'omics' data arise from the interplay of distinct logical categories. We show that two types of control – 'digital' (operating based on essentially binary logic) and 'analog' (operating based on gradual changes) – shape gene expression patterns. Our analysis of this interplay of control types employs concepts from network science, machine learning, and mathematical modelling. In this way, it illuminates the full complexity of this biological system.