"Exploring modularity in biological networks" is a philosophical take on the importance of mathematical models in life science. It stood out from the other papers we looked at because it is more an essay than a paper, regarding the usefulnes of network science in the biological field, which we found quite interesting. Often we are more occupied with how we do science instead why and to what end we do it, we therefore chose this paper as it has a different view point than most papers and futher question the usefulness of using mathematical models such as graph theory or network science.

The author of this paper offers philosophical view points to the way science is performed. Notably she splits science into several subcategories such as exploratory science, explanatory, predicitive, intergration and unifying science and states that mathematical models play an especially integral and active in the fields of exploratory science. This means that mathematical models are used especially to find correlations and other interesting phenomena within biological datasets, rather than to confirm established theses. Initially these kind of experiments were opposed to confirmatory experiments (experiment, designed to test and confirm hypotheses), but in recent times it became clear that exploratory experiments are often guided by background science, but lack a firm theoretical framework.

The author futhermore heightens the increasing importance of network science through the rise of omics projects, as networks facilitate the processing of large amount of data acquired by these projects. Network science can be used in a biological context as biological systems provide a high degree of modularity. Modularity is understood as a key feature of biological systems and can be found in many different areas such as protein interaction, signalling pathways neruobiological systems and in ecological systems. Modularity requires parts of the system to be more similar to one another than the parts are similar to other clusters. To show modularity graph models are used as they are easy to visualise and represent modular systems quite well. The author defines these models as an instrument which "performs epistemic function in scientific inquiry" meaning that a model is a reduce image of the reality which is still capable of representing relevant features of the original system.