Is my network module preserved and reproducible?

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In many applications, one is interested in determining which of the properties of a network module change across conditions. For example, to validate the existence of a module, it is desirable to show that it is reproducible (or preserved) in an independent test network. Here we study several types of network preservation statistics that do not require a module assignment in the test network. We distinguish network preservation statistics by the type of the underlying network. Some preservation statistics are defined for a general network (defined by an adjacency matrix) while others are only defined for a correlation network (constructed on the basis of pairwise correlations between numeric variables). Our applications show that the correlation structure facilitates the definition of particularly powerful module preservation statistics.

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