The most pressing unmet medical needs correspond to complex diseases caused by a combination of genetic and environmental factors. Traditional drug discovery strategies ignore the complexity of biological systems, screening compounds on individual targets rather than focusing on biomolecular networks. Despite growing evidence that the conditions we aim to treat are complex and require the development of treatments that exhibit polypharmacological properties, current drug discovery programs still rely on simplistic approaches during compound selection. Complexity is then considered during the development phase, where the costs and risks are much higher than in the discovery phase. This symposium aims to challenge the “one-target, one-disease” tradition and to discuss design and implementation of biological assays featuring multiple target strategies during the primary discovery steps.

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