

Title: Human Cell Systems Biology for Drug Discovery and Chemical Safety

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Human cell systems biology couples a large-scale chemical biology effort with physiologically relevant in vitro assays with the goal of predicting drug efficacy and safety prior to human testing or exposure. Assays that model human disease biology more accurately and also meet the throughput needs of drug discovery research contribute towards this goal. Biologically Multiplexed Activity Profiling (BioMAP®) entails the statistical analysis of signatures derived from measurements of disease biomarker endpoints generated from primary human cell-based disease models for understanding mechanisms of efficacy and safety. We will describe how this method is being applied in phenotypic drug discovery programs for lead selection for identifying mechanisms of action, as well as in safety assessment for toxicity prediction and for defining novel mechanisms of toxicity.