PHARMACOMES: Cause-and-Effect Models linking Drugs, Targets and Disease Mechanisms

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Abstract

Cause-and-Effect models are knowledge assemblies representing essential causal and correlative relationships in a pre-defined disease context. Unlike “pathways”, Cause-and-Effect models can span across scales and readily integrate clinical readouts and endpoints. In my talk, I will guide through some of our work on generating Cause-and-Effect models in the field of neurodegenerative diseases (Alzheimer; Parkinsonism) and will demonstrate, how we generate those using advanced, AI-based “text-2-graph” workflows.

The enrichment of Cause-and-Effect models with drug-target information allows us to generate “disease-specific PHARMACOMES”. PHARMACOMES link drug-target information to specific pathophysiology mechanisms and are ideally suited for rational approaches towards modulation of pathophysiology mechanisms. Examples for productive usage of this novel approach in drug repurposing experiments will cover the COVID-19 PHARMACOME and the Human Brain PHARMACOME

Keywords

Pathophysiology, Pharmacome, Drug repurposing, Cause-and-Effect models, Alzheimer, Parkinsonism, COVID-19

References

