Quantitative Systems Pharmacology (QSP) Rheumatoid Arthritis Model

Nearly 40 Phase 2 and Phase 3 clinical trials were used in training this model, spanning 13 distinct therapeutic agents from 7 drug classes, including TNF inhibitors, T & B cell inhibitors, JAK inhibitors, and IL-6 inhibitors across patients with inadequate response to methotrexate and patients with inadequate response to TNF inhibitors.

Key Applications

- Support customized pre-trial disease initiation and therapy failure pipelines
- Predict clinical efficacy of novel compounds as monotherapy and combination therapy with existing compounds
- Generate virtual populations that include inter-patient variability in pathophysiology and clinical endpoints
- Model interactions between disease-relevant biological features, including cells and cytokines, to generate pathophysiological features of disease that inform clinical endpoints in a single virtual population

Key Features

- Convenient, efficient, and thorough generation and calibration of virtual populations
- Includes both qualitative and quantitative data during model training
- Represents clinical trials with specific entrance criteria
- Plot and analyze simulation results in the same platform
- Automatically visualize connections between model components
- Export data to other programs for ad hoc analyses

Sound Science

Support
for key RA clinical endpoints, including ACR and DAS28

Models
inflammatory environments of individual RA joints to support TJC/SJC measurements

Includes
detailed interactions between immune cells leading cytokine production and subsequent joint inflammation

Designed
with inter-patient variability of desired biological, pathophysiological, and clinical metrics in mind to replicate clinical trial populations

Validated virtual population with new biological and pharmacological components can include novel compound predictions while recapitulating and validating against existing clinical trial data.

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