CERTARA

Simcyp™ Discovery

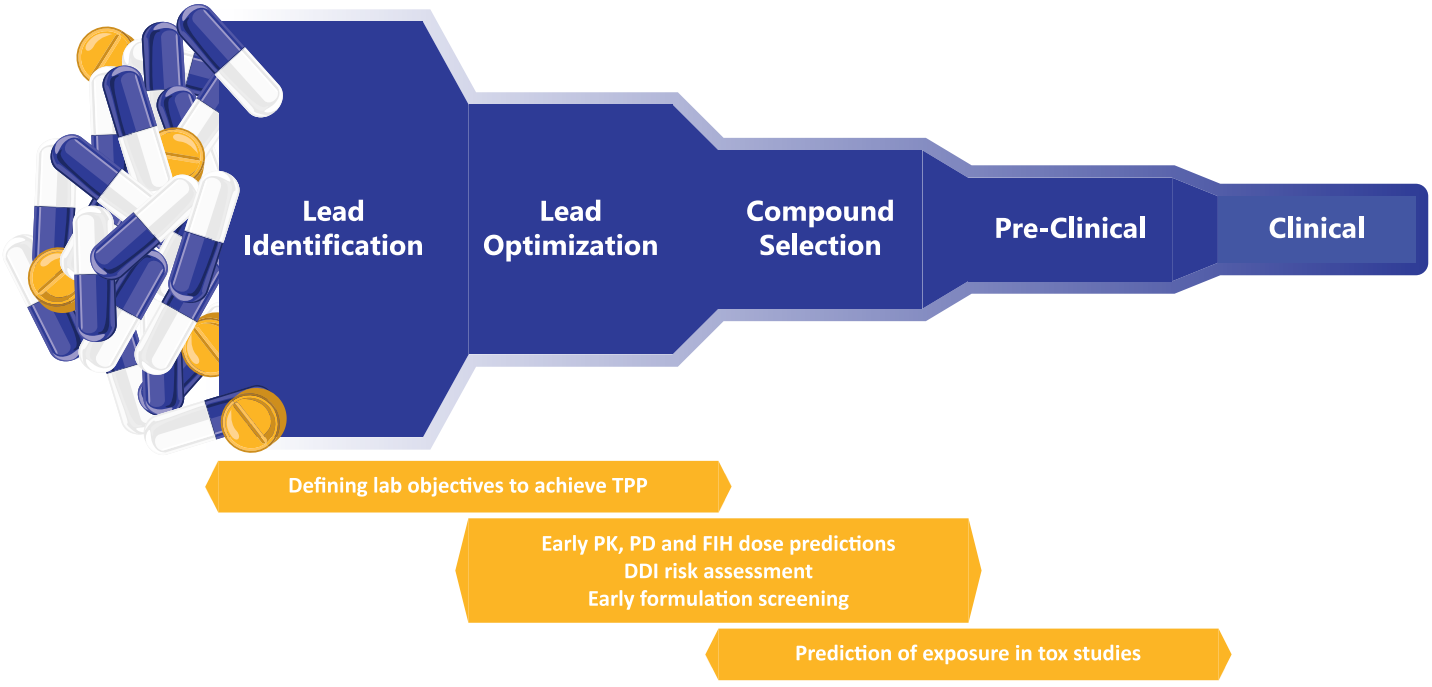
Simcyp™ Discovery Simulator

Increase confidence in decisions in pre-IND stage and translational drug

The attrition rate of drug programs in early-stage development is high, with two-thirds of preclinical programs failing to move successfully to Phase 1. *How do we better inform translational R&D decisions to de-risk investments and help increase probability of success?*

Tailored for discovery and translational scientists, Simcyp Discovery Simulator is an intuitive software that delivers confidence in decision-making during the pre-Investigational New Drug (IND) application and translational development. Simcyp Discovery is based on physiologically-based pharmacokinetic (PBPK) modeling and simulation, a regulatory-adopted, versatile tool in drug development that helps answer a myriad of "what if" questions without clinical testing.

Derived from the industry-standard Simcyp Simulator, Simcyp Discovery advances and accelerates small molecule drug discovery and translational research.



TPP = target product profile; PK = pharmacokinetics; PD = pharmacodynamics; FIH = first-in-human; DDI = drug-drug interactions

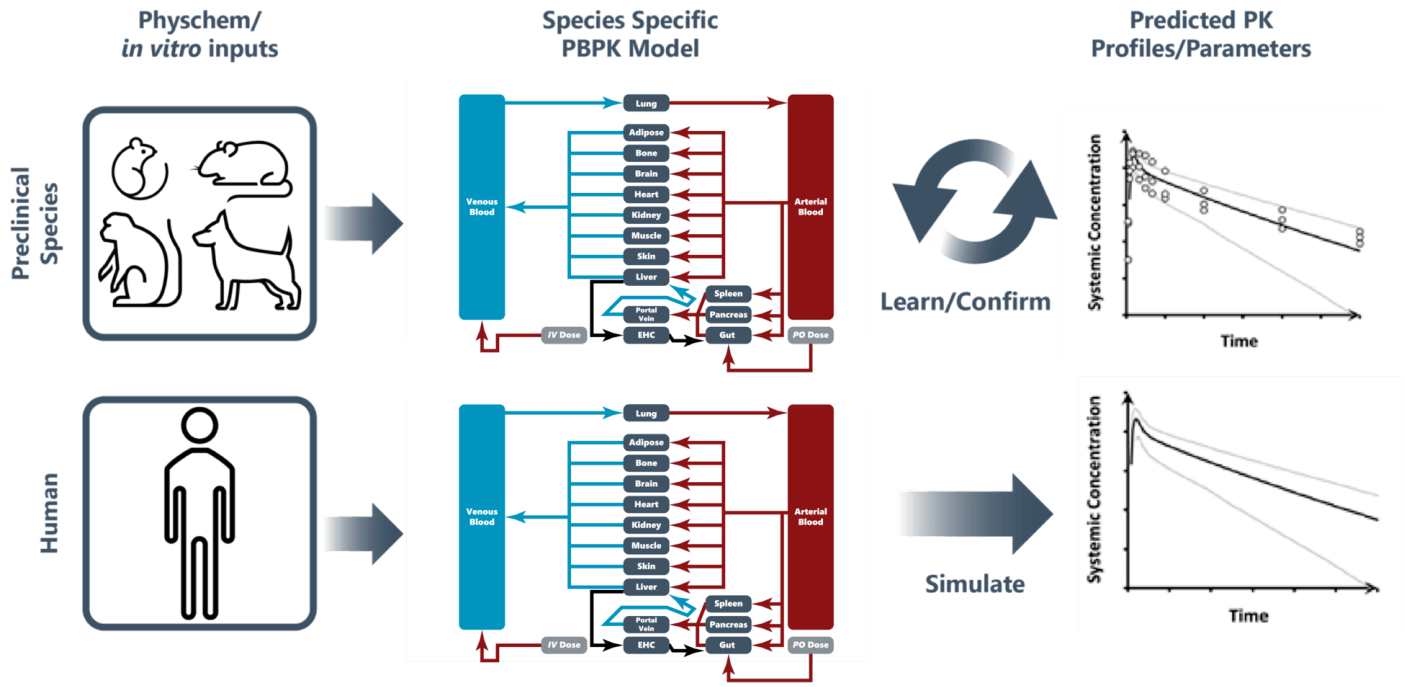
Simcyp Discovery has many applications and benefits during early stage of drug development, including 4 major use cases.

FIRST IN HUMAN (FIH) DOSE PREDICTION

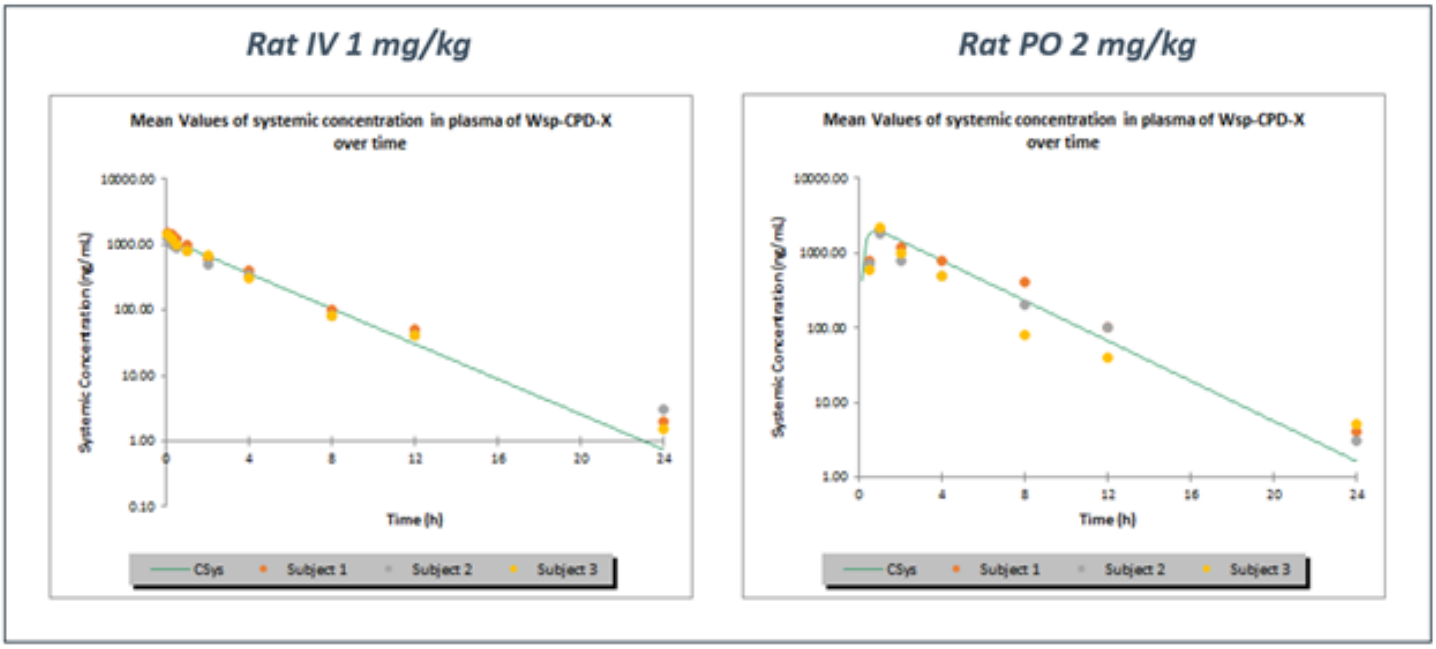
The proposed FIH dose as well as a robust rationale supporting FIH dose selection are essential components of every IND application. In vitro in vivo extrapolation (IVIVE) – linked PBPK can be applied for PK and dose prediction in early stages where data are limited. This enables a mechanistic understanding of the effect of physiological variables.

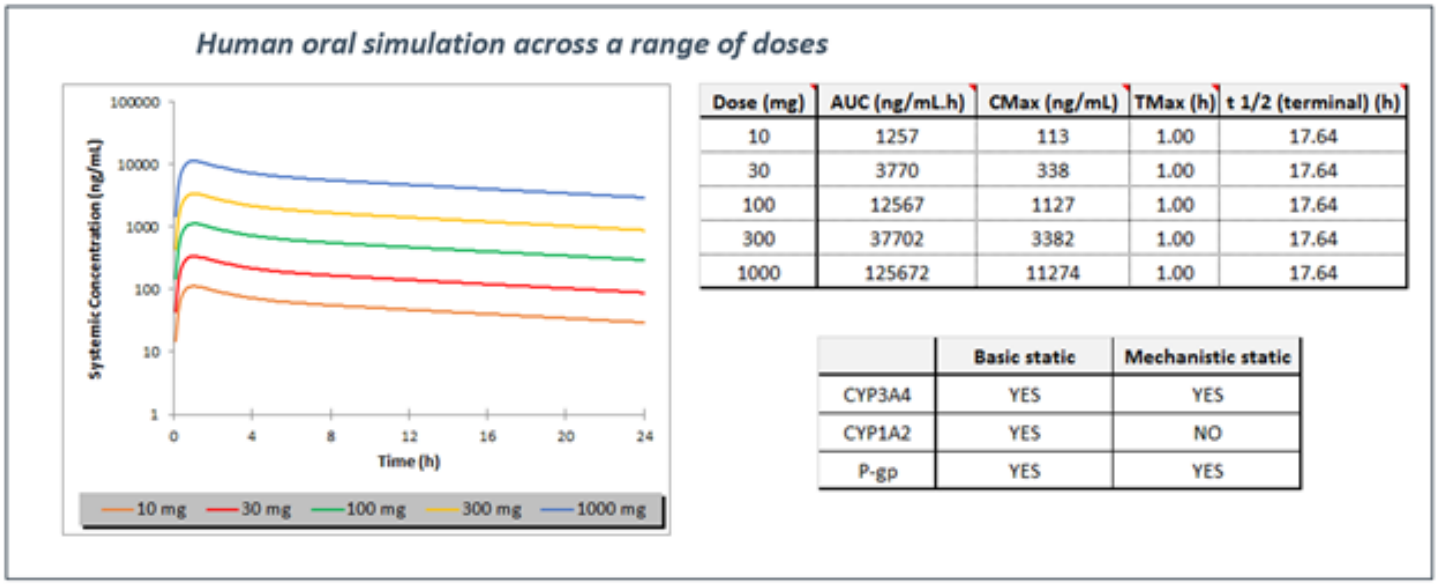
- Predicts early drug development outcomes with healthy volunteer, mouse, rat, dog, and monkey PBPK models
- Compound information includes physchem, blood binding, absorption, data, solubility, permeability and clearance
- Population data includes demographics, tissue blood flow rates, tissue composition, enzyme concentrations, pH, transit times and bile salt concentrations in different regions of the GI tract
- Includes non-compartmental analysis and compartmental fitting to help parametrize models

Simcyp Discovery Modeling Strategy



Simcyp Discovery model validation and FIH simulation





Dose (mg)	AUC (ng/mL.h)	CMax (ng/mL)	TMax (h)	t 1/2 (terminal) (h)
10	1257	113	1.00	17.64
30	3770	338	1.00	17.64
100	12567	1127	1.00	17.64
300	37702	3382	1.00	17.64
1000	125672	11274	1.00	17.64

	Basic static	Mechanistic static
CYP3A4	YES	YES
CYP1A2	YES	NO
P-gp	YES	YES

For illustrative purposes only

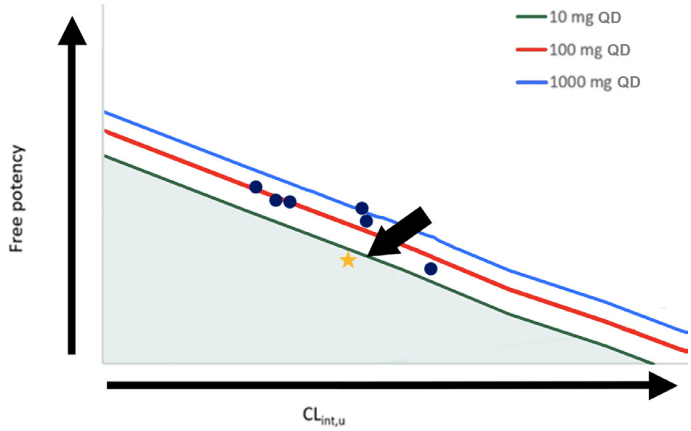
EARLY DDI SCREENING

Drug-drug interactions are a common clinical problem that can increase the risk of adverse events and/or can reduce treatment efficacy. Regulators require an understanding of the investigational drug's potential to interact with other drugs. Simcyp Discovery flags DDI risks using its static DDI calculator.

COMPOUND PRIORITIZATION AND SELECTION

Identification of compounds that could be promising candidates for drug development is a critical step, before advancing to the more-costly stages of preclinical and clinical trials. Simcyp Discovery provides mechanistic PK analysis for screening, pipeline optimization and lead candidate selection. It supports unlimited, high-throughput batch screening and can connect to database platforms, such as Certara's D360 Discovery Informatics Hub, for use in high throughput mode. Simcyp Discovery also helps guide decisions regarding the optimal laboratory objectives for a chemical series to achieve the target product profile (TPP), as well as prediction of exposure for toxicology studies.

Definition of laboratory objectives



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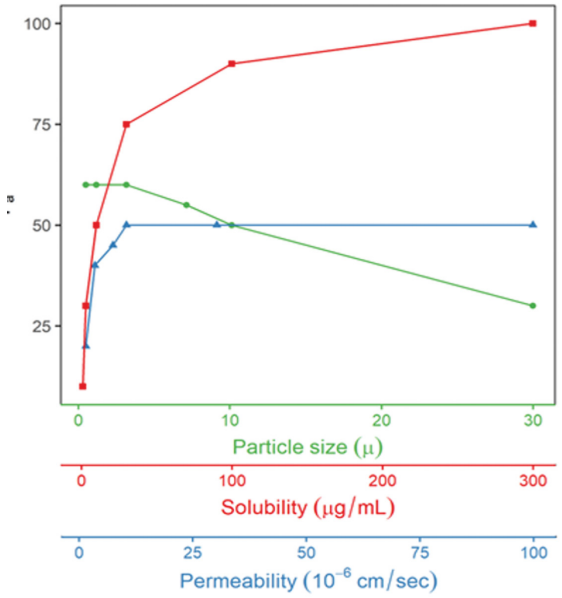
FORMULATION SCIENCE

Simcyp Discovery can help inform and expedite the formulation development process through a "predict, learn, and confirm" approach. Through implementation of this methodology, the dissolution and absorption characteristics of a drug's formulation may be evaluated in order to select the formulation with optimal pharmacokinetic and pharmacodynamic performance.

- Allows estimation of PK parameters from the in vivo data for the reference formulation (ie IV, oral solution, etc)
- Predicts oral absorption using the advanced dissolution, absorption and metabolism (ADAM) absorption model
- Supports simulation of complex PK phenomenon such as non-linear and time-dependent PK

Sensitivity analysis to guide formulation design



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To learn more about Simcyp Discovery Simulator, please contact simcyp.support@certara.com

About Certara

Certara accelerates medicines using proprietary biosimulation software, technology and services to transform traditional drug discovery and development. Its clients include more than 2,000 biopharmaceutical companies, academic institutions, and regulatory agencies across 62 countries.

For more information visit www.certara.com or email sales@certara.com.