

Quantitative Systems Pharmacology and Mechanistic PD — Hands-on

Develop a conceptual understanding of quantitative systems pharmacology (QSP) and mechanistic pharmacodynamics (PD). This module shows how pathway level models connect drug exposure, targets and disease biology, and how these models can be used to explore virtual patient scenarios, biomarkers, and therapy strategies for model informed decisions.

Quantitative Systems Pharmacology and Mechanistic PD

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Session 1

Fee: Rs 8800 [Apply Now](#)

QSP & Systems Pharmacology Foundations

What is quantitative systems pharmacology and where it fits

bridge between PK/PD and systems biology [link](#)
targets, pathways and outcomes [use across](#)
discovery and clinic

Key building blocks of QSP models (high level)

compartments and species concepts [pathway](#)

interactions and feedback ideas **parameters and biological data sources**

Typical use cases for QSP and mechanistic PD

dose and schedule exploration **combination therapy reasoning** **biomarker and responder analysis**

Session 2

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Mechanistic PD & Model Structure

Mechanistic PD concepts: target binding and signaling

receptor occupancy ideas **signal transduction and cascades** **feedback and tolerance thinking**

Linking exposure to pathway modulation (conceptual)

from PK profiles to local concentrations **drug effect on key nodes and species** **translating changes to clinical markers**

Choosing level of detail in QSP and PD models

minimal vs detailed structures **fit for purpose simplification** **traceable assumptions and scope**

Session 3

Fee: Rs 14800 Apply Now

Scenario Analysis & Virtual Patients

Using QSP and mechanistic PD for scenario exploration

dose and schedule what if analysis **combination and sequencing ideas** **early identification of failure modes**

Concepts for virtual patients and variability

varying parameters within biological ranges

heterogeneity in pathways and responses **responder and non responder patterns**

Connecting model outputs to clinical endpoints and biomarkers

mapping species to measurable markers **visual summaries for teams and boards** **communicating uncertainty bands**

Session 4

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Mini Capstone: QSP Strategy & Dossier

Select a development or clinical question for QSP support

summarise indication and unmet need **state precise model assisted question** **identify key stakeholders**

Outline a simple QSP and mechanistic PD strategy

sketch conceptual model diagram **list required data and assumptions** **define scenarios and outputs**

Deliverables: QSP strategy slide deck and one page summary

PDF or PPTX **ready for MIDD or PMx discussions** **template for future QSP projects**