

**Workshop title:** Quantitative systems pharmacology model development using gQSPSim: a GUI-based open-source platform for SimBiology models

**Chair person 1 Name:** Fulden Buyukozturk

**Names of Instructors/Teaching Assistants:**

- Dr. Kapil Gadkar
- Dr. Iraj Hosseini
- Dr. Justin Feigelman

**Cost:** Free

### **Description**

gQSPSim is a comprehensive GUI-based MATLAB app developed by Genentech to perform key processes in QSP model development and analyses (Fig. 1):

1. Model calibration to data using global and local optimization methods (scatter search, particle swarm)
2. Developing virtual patient populations to explore variability and uncertainty in the underlying system biology
3. Predictions for virtual populations for interventions of interest (therapies, genetic alterations, etc)

gQSPSim works with any SimBiology model and provides an interactive interface for all features, and the ability to generate presentation-ready figures, and save and share working sessions for future use.

In this half-day workshop, we will introduce the gQSPSim framework, building blocks and functionalities. The application and features of gQSPSim are demonstrated using 1) a standard target-mediated drug disposition (TMDD) model, and 2) a published PCSK9 QSP model (Gadkar et al. 2014). Workshop attendees will be instructed on how to use the app to perform the QSP model development key processes listed above. We will explore the use of acceptance criteria to generate virtual cohorts under different scenarios and use visual diagnostic tools to compare virtual patients with the pre-specified range of measurements. Lastly, we will use statistical data to generate a virtual population from a virtual cohort.

### **Materials Provided:**

Access to gQSPSim and the training materials and a finalized gQSPSim session file for reference and practice after the workshop

30-day software trial for SimBiology and MATLAB

(will provide a link to download)

### **Requirements for attendees:**

Prior experience with QSP modeling

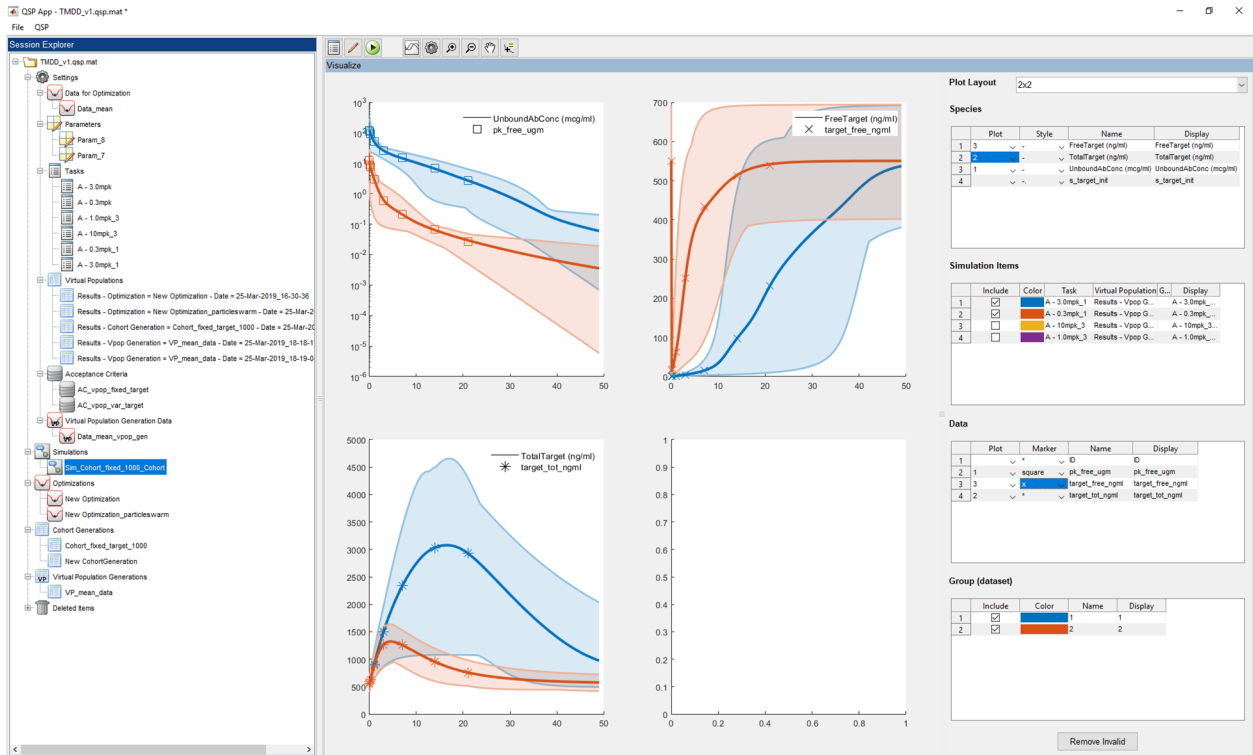


Figure 1. A screenshot of qGSPSim