

Introducing InSilicoTrials' NONMEM simulator: Cloud-based simulation tool for NONMEM models

Mark Lovern¹, Matteo Gazzin¹, Daniel Röshammar¹, Nathan Teuscher^{1,2}

¹InSilicoTrials Technologies S.p.A, Riva Grumula 2, 34123, Trieste, Italy

²Teuscher Solutions LLC, USA

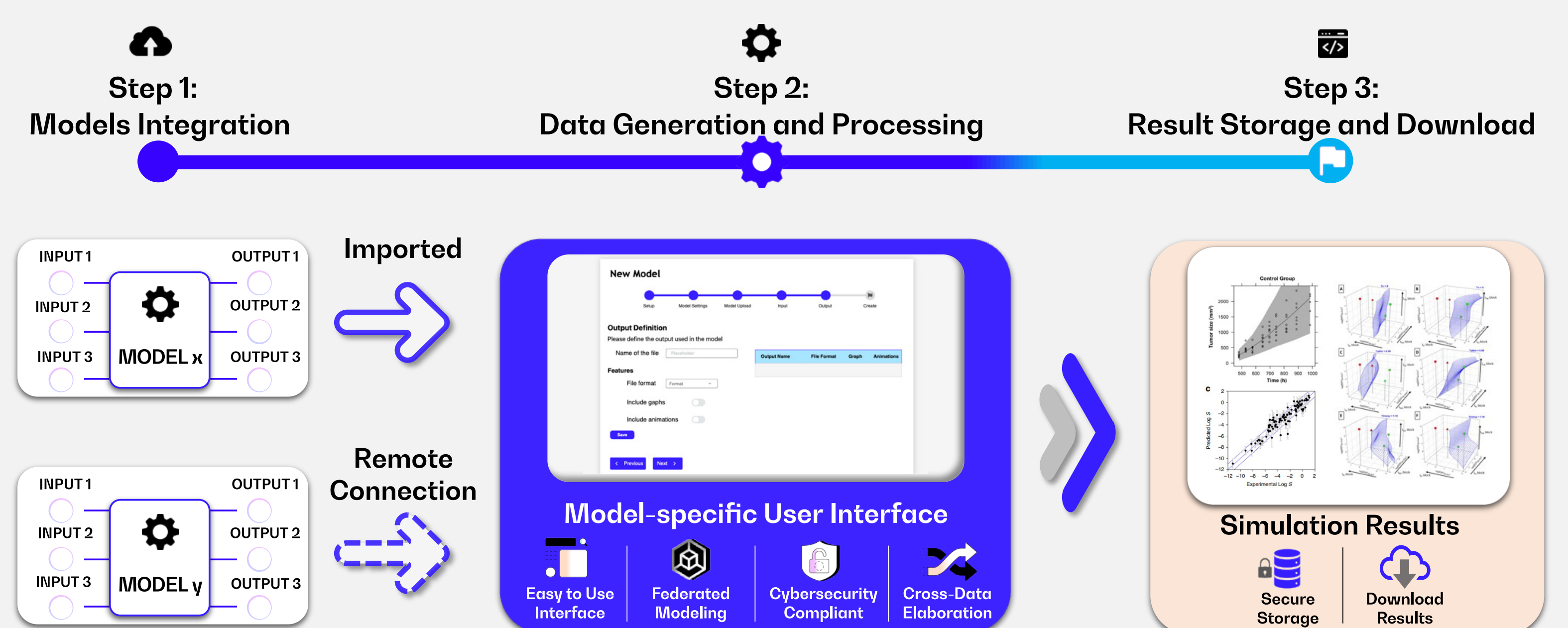
INTRODUCTION

- NONMEM continues to be the pharmaceutical industry standard for non-linear mixed effects modeling and simulation
- Historically, simulating from models developed in NONMEM has required users to either prepare simulation data sets or re-articulate the model(s) in other platforms such as R
- The InSilicoTrials' NONMEM simulator is a cloud-based application that allows users to quickly and efficiently simulate from NONMEM models using an intuitive graphical user interface

OBJECTIVES

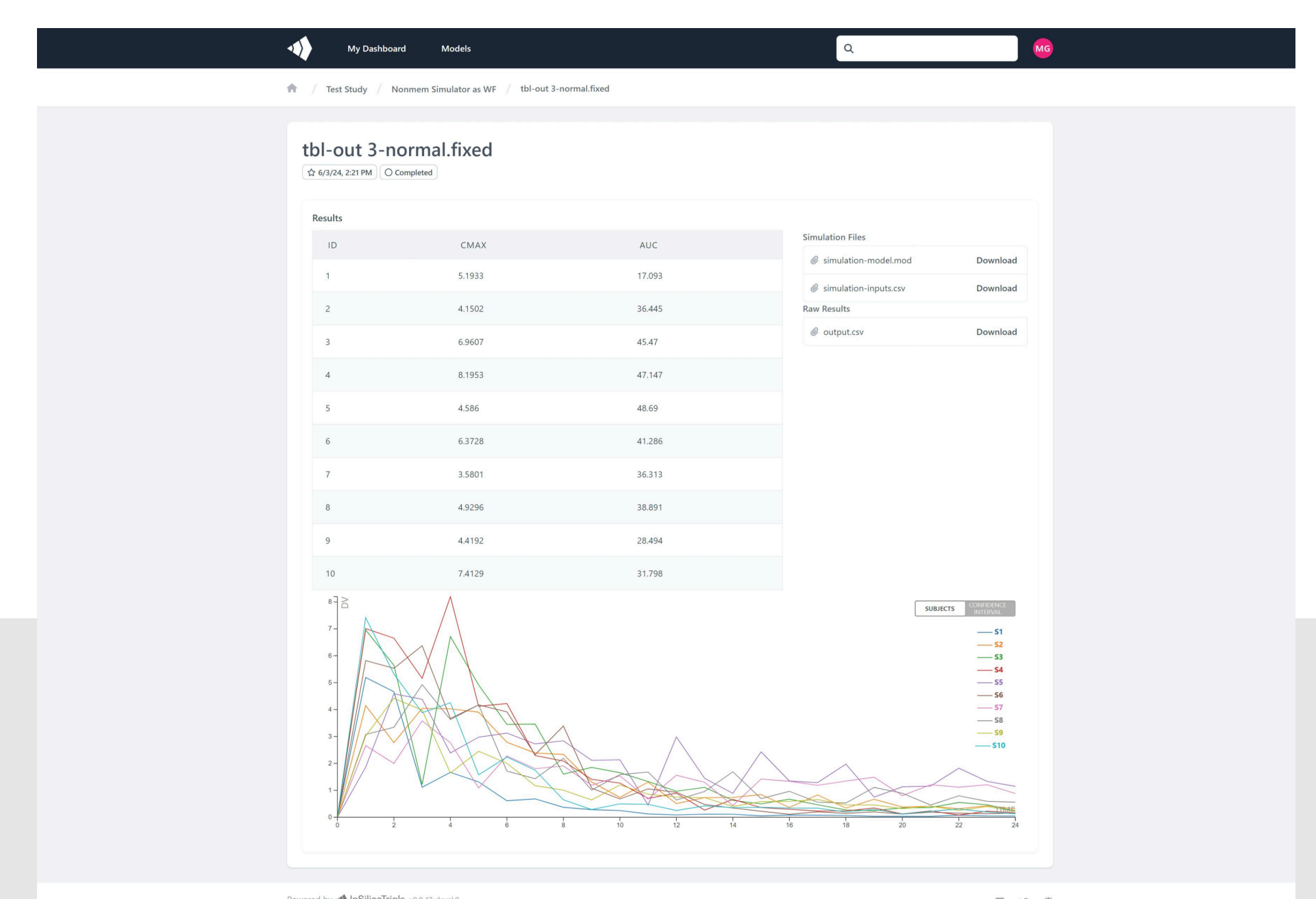
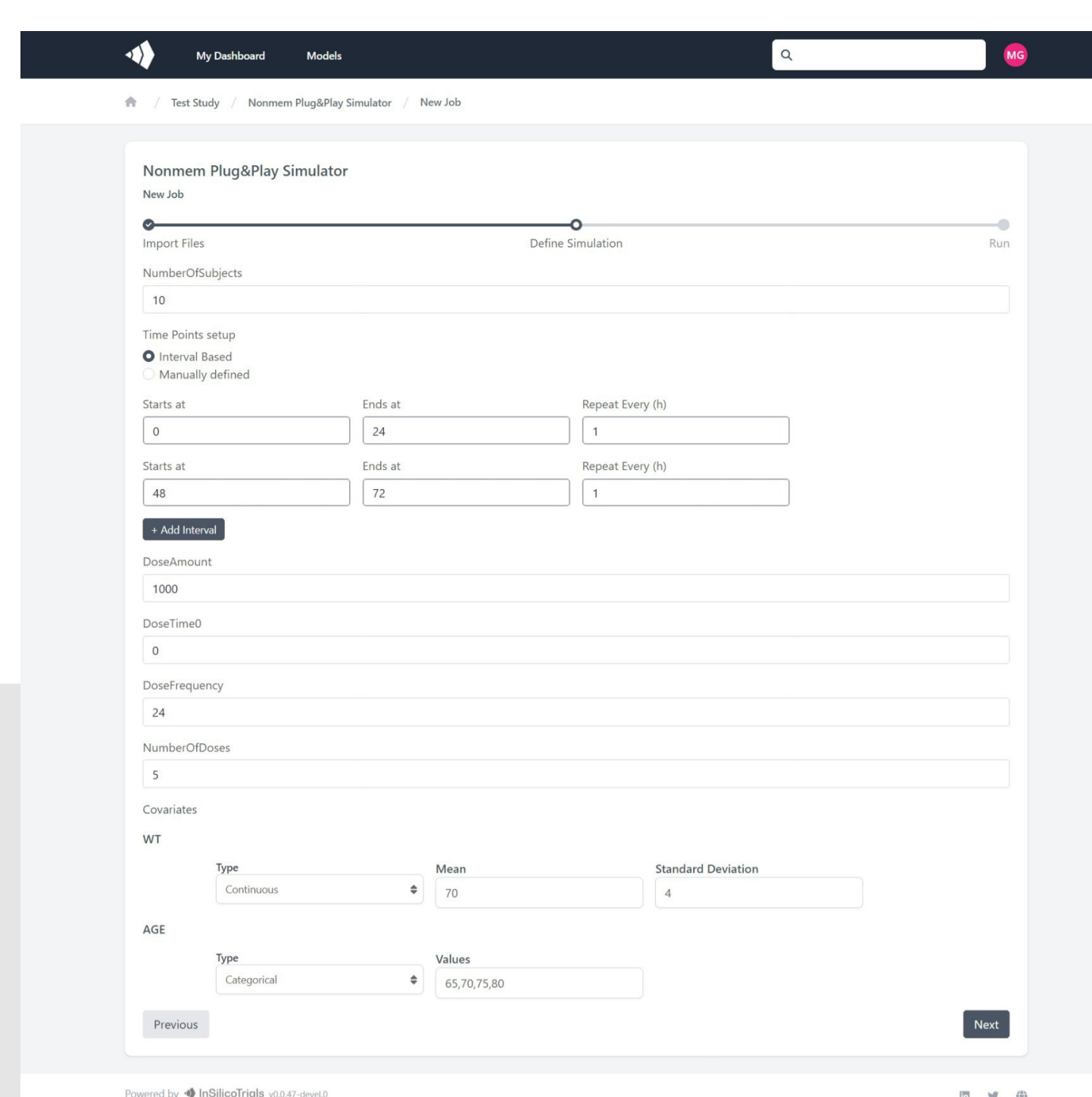
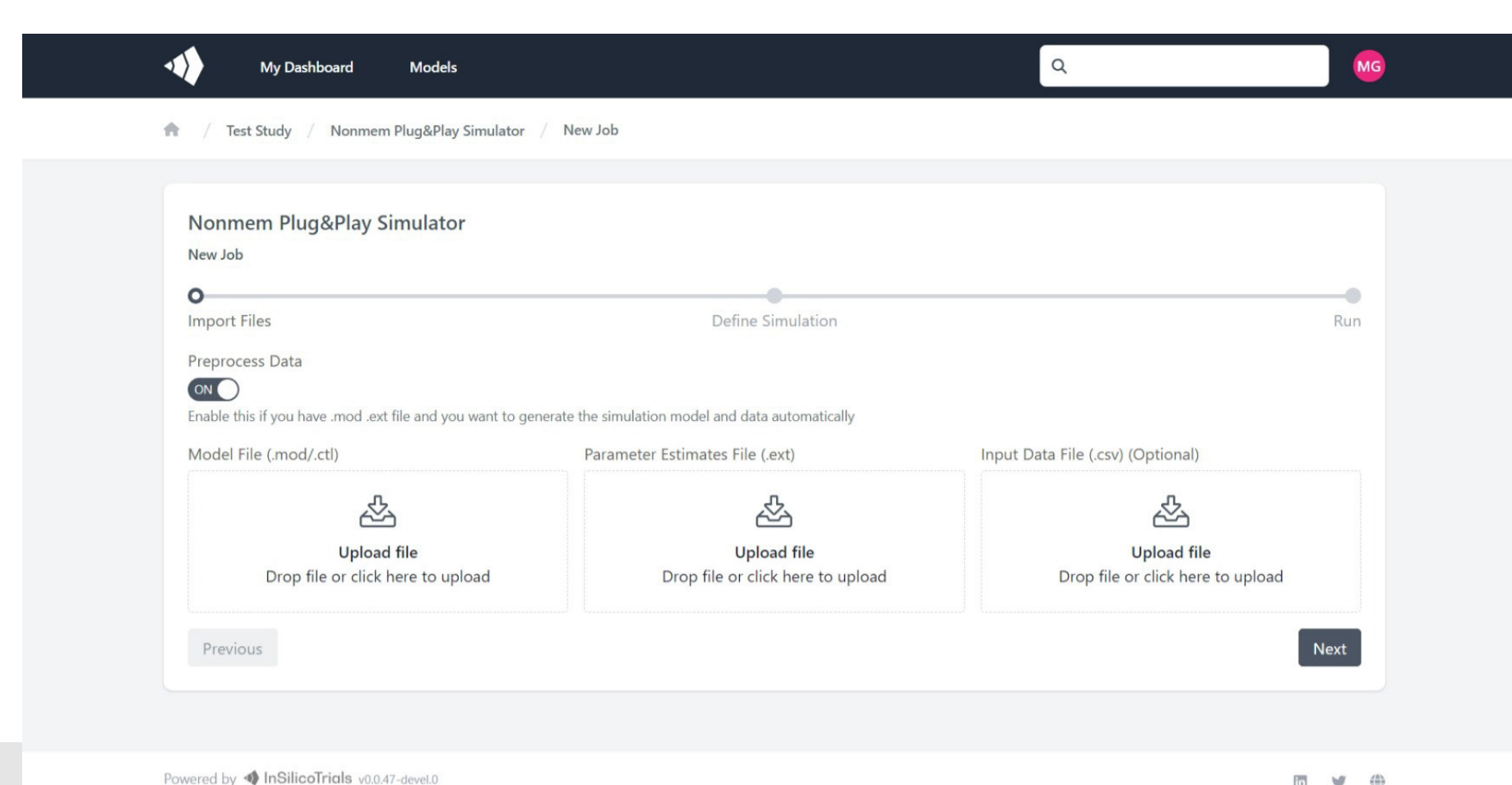
- Reduce the time and effort needed to perform simulations using models developed in NONMEM
- Develop a cloud-based NONMEM simulator that supports integration with complex, multi-platform workflows

PLUG N' PLAY NONMEM SIMULATOR



METHODS

- The NONMEM Simulator is integrated within the InSilicoTrials platform, a modern, cloud-native, and modular web platform that utilizes a broad array of Azure Cloud Services
- Users have three options for configuring the simulation model and data set:
 - Option 1: Uploading .mod file configured for parameter estimation along with the original analysis data set
 - Option 2: Uploading .mod file configured for simulation only
 - Option 3: Uploading ready-to-use simulation model and data set
- In Options 1 and 2, the NONMEM simulator automatically generates the simulation data set based on user settings supplied through the simulator interface
- The system then dynamically launches a dedicated NONMEM engine through Azure Batch
- Upon simulation completion, a secure output page is created in which simulation outputs may be viewed and downloaded



RESULTS

- The InSilicoTrials NONMEM simulator was tested using a variety of models published in the literature, including those in the tutorials by Bauer^{1,2} and the semi-mechanistic neutrophil model reported by Mangas-Sanjuan et al³.
- All model simulations ran successfully, and outputs were consistent with published results
- Sample results from Model X are shown above

CONCLUSION

- Our cloud-based simulator allows users to simulate from a wide variety of NONMEM models using an intuitive graphical interface that obviates the need for manual creation of the simulation data set or re-coding of the model
- The NONMEM simulator may be integrated into more complex simulation workflows or applications such as a clinical trial simulator

REFERENCES

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 Mangas-Sanjuan V, Buil-Bruna N, Garrido MJ, Soto E, Trocéniz IF. Semimechanistic cell-cycle type-based pharmacokinetic/pharmacodynamic model of chemotherapy-induced neutropenic effects of diflomotecan under different dosing schedules. J Pharmacol Exp Ther. 2015 Jul;354(1):55-64.

DISCOVER

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