



Heidelberg Institute for  
Theoretical Studies



# Tutorial Workshop Modelling and Simulation Tools in Systems Biology



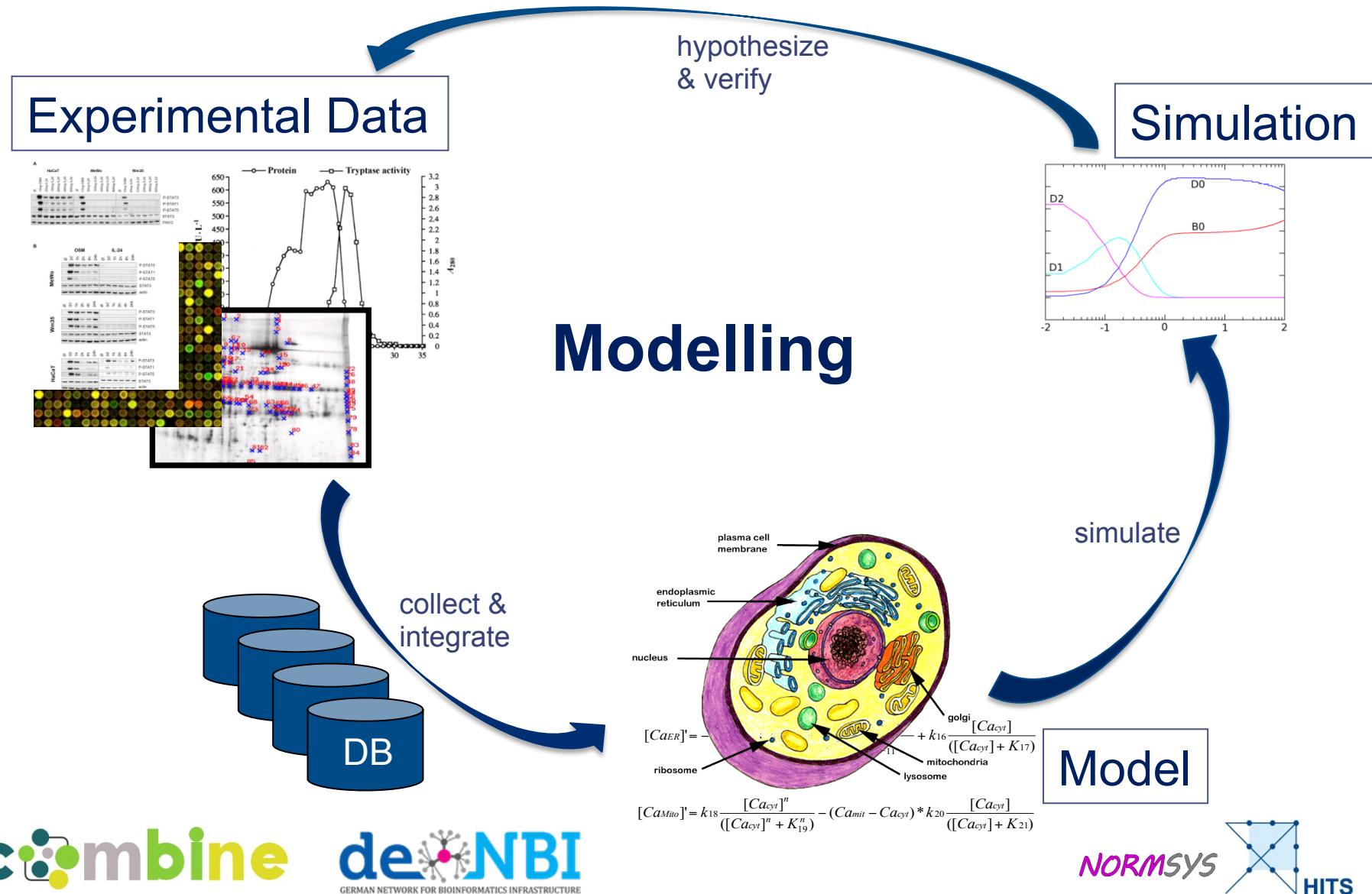
18<sup>th</sup> INTERNATIONAL CONFERENCE  
ON SYSTEMS BIOLOGY

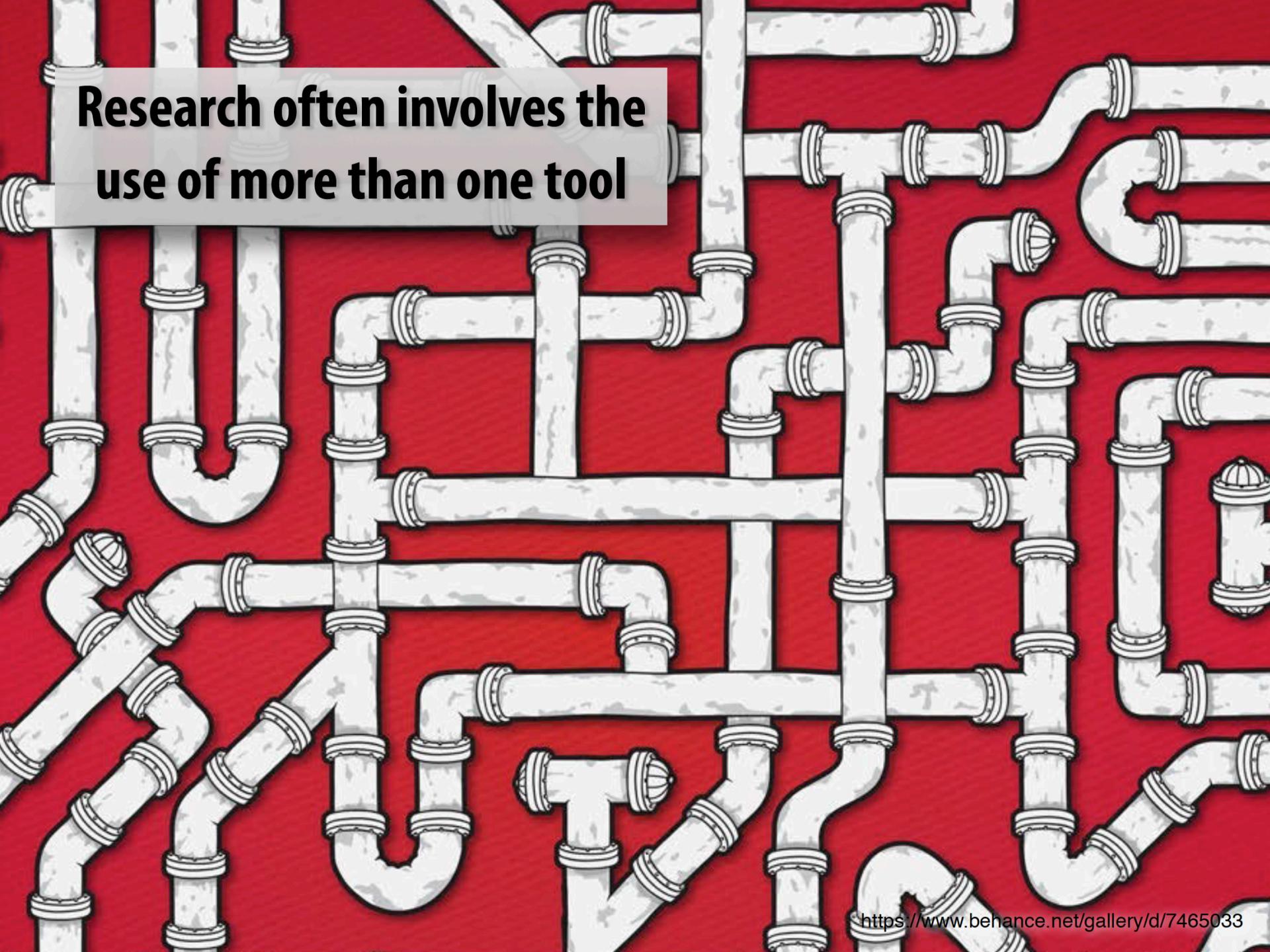
August 6-12, 2017  
Blacksburg, Virginia, USA

# Modelling is Data Representation



# Systems Biology Workflows





**Research often involves the  
use of more than one tool**

# What will you learn here?

- Model setup using different software tools and systems biology platforms
- Using experimental data for setting up quantitative models
- Parameter estimation, optimization and model fitting
- Simulation, analysis and visualization of biochemical models
- Database supported modelling: Integrated data management and model DBs
- Community standards and formats for systems biology models

## APPLYING TOOLS FOR MODELLING

What you won't learn: Details about modelling approaches and algorithms

# Tutorial Agenda – Morning Sessions

- 09:00 – 9:15 Introduction: **Modelling and Simulation Tools in Systems Biology**  
Martin Golebiewski (HITS, Germany)
- 09:15 – 9:45 **COMBINE and its Standards:**  
**BioPax, SBGN, SBML, SED-ML, CellML, SBOL, NeuroML**  
<http://co.mbine.org>  
Martin Golebiewski (HITS, Germany)
- 9:45 – 10:20 **SABIO-RK – Reaction Kinetics Database** (presentation/demo)  
<http://sabio.h-its.org/>  
Andreas Weidemann & Martin Golebiewski (HITS, Germany)
- 10:20 - 10:45 *Coffee Break*
- 10:45 – 12:45 **CellDesigner – Modeling Tool for Biochemical Networks** (presentation/hands-on)  
<http://www.celldesigner.org>  
Akira Funahashi & Noriko Hiroi (Keio University, Yokohama, Japan)
- 12:45 - 13:45 *Lunch Break*

# Tutorial Agenda – Afternoon Sessions

12:45 - 13:45 *Lunch Break*

13:45 - 15:45 **COPASI – Biochemical System Simulator** (presentation/hands-on)  
<http://www.copasi.org/>

Frank Bergmann, Jürgen Pahle, Sven Sahle, Ursula Kummer (Heidelberg University, Germany), Stefan Hoops (Virginia Tech, Blacksburg, VA, USA), Pedro Mendes (University of Connecticut Health Center, CT, USA)

15:45 - 16:00 *Coffee Break*

16:00 – 16:45 **Integrated Data and Model Management: FAIRDOM&SEEK** (presentation/demo)  
<http://fair-dom.org/seek>

Ron Henkel, Andreas Weidemann & Martin Golebiewski (HITS, Germany)

16:45 – 17:55 **VCell - VirtualCell** (presentation/demo)  
<http://vcell.org>

Leslie M. Loew (Univ. of Connecticut Health Center, CT, USA)

17:55 – 18:00 **Conclusions & Wrap-Up**