AstraZeneca (AZ) & GlaxoSmithKline (GSK) Collaborations

Professor Mike Chappell & Dr Neil Evans

School of Engineering, University of Warwick

Professor James Yates, GSK & UoW (Hon. Prof.)

Initial Links

Professor Phil Arundel

Initial link through annual PKUK meetings and IFAC BMS Symposium (Warwick 1998).

Need for more researchers with modelling skills in the pharma industry.

Professor Arundel has been an Honorary Professor within the School of Engineering for more than 10 years now.

Collaborative Projects with AZ

- **Ed Watson** - *Modelling and control of glucose-insulin dynamics (Type 2 diabetes)* - (AZ funded PhD studentship, 2009-2012)
- **Tom Grandjean** - *Modelling the kinetics of BCRP/hepatic transporters and associated inhibitors* - (MRC Capacity Building Studentship + AZ top-up, 2010-2013)
- **Tariq Abdulla** - "*Structural Identifiability and Indistinguishability Analysis as Tools for Quantitative and Systems Toxicology*" supporting the replacement, reduction and refinement (3Rs) of animal use. (Funded by the NC3Rs/EPSRC (£245K), 2012-2015)

Collaborative Projects with AZ

IMPACT *(Innovative Modelling for Pharmacological Advances through Collaborative Training)* 2012-2016

- in collaboration with AstraZeneca (Mölndal, Sweden & Alderley Park/Cambridge) and associate partners - EU, Marie Curie People ITN European Industrial Doctorate (EID) scheme (€1.467M).

- new approaches to discovering drugs and understanding therapeutic mechanisms through **Quantitative and Systems Pharmacology (QSP).**

Partnership

WARWICK
THE UNIVERSITY OF WARWICK

- The IMPACT project formed an interdisciplinary collaborative partnership between AstraZeneca (AZ, Sweden) and the University of Warwick (UoW, UK) to train Early Stage Researchers (ESRs) in systems modelling tools and techniques enabling them to perform research projects at the forefront of international pharmacokinetic (PK) and pharmacodynamic (PD) analysis.

- The project built upon extremely strong research and training links already formed between the UoW and AZ (UK) supporting the clearly identified need within AZ worldwide to train more personnel with high-level skills in systems modelling for future drug development.

AstraZeneca

Research Partners

Main Partners:

- University of Warwick (UoW): Prof. Mike Chappell & Dr Neil Evans
- AstraZeneca (AZ, Sweden): Dr Peter Gennemark, Dr Markus Friden, Dr Joanna Parkinson
- AstraZeneca (AZ,UK): Dr James Yates, Dr Teresa Collins

Associated Partners:

- Fraunhofer Chalmers Centre (FCC): Dr Mats Jirstrand
- Swedish University of Agricultural Sciences (SLU): Prof. Johan Gabrielsson
- Uppsala University (UU): Dr Margareta Hammarlund-Udenaes

Project Structure

WP1: Modelling Dose Response Time Outcome Relationships

Robert Andersson & David Janzen

WP2: Evaluation of lung tissue target site exposure to inhaled drugs using modeling of pharmacologic data

Elin Boger

WP3: Modelling Cardiovascular Safety – Target Engagement – Exposure

Linnea Bergenholm

WP4: Deconvolution in Non-Linear Ordinary Differential Equations for Quantitative and Systems Pharmacology

Magnus Tragardh

PhD Collaborative Projects with AZ & GSK

- **Simon Carter** - Mechanistic modelling of *in vitro* transporter data to improve translational modelling of the transporter-mediated human pharmacokinetics and DDI predictions (BBSRC Case Award with AZ, 2015-2019) – Now working as a Pharmacometrician at AZ, Mölndal
- **Carlos Traynor -** High-throughput data analysis to predict clinical outcome (EPSRC Studentship with AZ top-up, 2017-2021) – Now working as a PKPD modeller at AZ, Cambridge
- **Linda Wanika -** Meta-Analysis of Rare Adverse Event Data (EPSRC Case Award with AZ, 2018-2022) – EPSRC Postdoc – UoW
- **Ben Clements** - Clinical Trial and Treatment Optimisation for Neurofibromatosis Type 1 (EPSRC + AZ Top-up, 2020-present)
- **With GSK (& UoW Cancer Research Centre)** – **Patrick Joyce –** Modelling the effects of combinatorial anti-cancer agents on tumour volume (EPSRC, 2022-)