Quantitative Systems Pharmacology for Immuno-oncology

Date: Monday 25th – Tuesday 26th April 2022

Venue: **In-person** | Garden Room, EMBL-EBI Main Building, Wellcome Genome Campus, Hinxton, Cambridge, UK

Online | By Zoom. Link will be sent to registered participants

Registration: Free for EMBL-EBI Industry Programme members and invited speakers. There is a £70 charge for non-EMBL-EBI Industry Programme members to cover the cost of day-time catering for the 2 days.

Registration is required. Event logistics will be managed by **Emily Pomeroy** (epomeroy@ebi.ac.uk)

Day One: Monday 25th April 2022

Time	Presentation	Speaker/moderator
08:30-09:00	**Arrival/Registration**	
09:00-09:10	**Welcome & introduction**	EBI organisers
09:10-09:20	Motivation & desired outcomes: Industry organisers	Lourdes Cucurull-Sanchez
09:20-09:30	UK QSP Network: current challenges and opportunities	Marcus Tindall
09:30-10:15 10:15-10:30	**Keynote**: Clinical Pharmacology Perspective (**Title TBD**) Q&A/Discussion	Alex Phipps AstraZeneca
10:30-10:45	**BREAK**	
	Theme 1: Combination Therapy	**Chair** |James Yates
10:45-11:10 11:10-11:20	Beyond the single average tumor: Understanding IO combinations using a clinical QSP model that incorporates heterogeneity in patient response Q&A	Rukmini Kumar (possibly by zoom)
11:20-11:45 11:45-11:55	Specific aspects of the implementation of different combination therapies in the QSP model Q&A	Oleg Demin Jr.
11:55-12:20 12:20-12:30	Spatial and non-spatial Quantitative Systems Pharmacology modeling in immuno-oncology Q&A	Aleksander Popel (possibly by Zoom)

12:30-13:00	Moderated Panel Discussion	Chairs TBD
13:00-14:00	**LUNCH**	
	Theme 2: Omics data integration	**Chair** | Lourdes Cucurull-Sanchez
14:00-14:25 14:25-14:35	Integration of omics data to inform QSP models of immune-oncology therapies: from principle to practice Q&A	Georgia Lazarou
14:35-15:00 15:00-15:10	Integrating prior knowledge and omics: from modelling to reasoning Q&A	Sebastian Lobentanzer
15:10-15:25	**Short Break**	
15:25-15:50 15:50-16:00	BioModels - a resource for reproducible immune-oncology models Q&A	Rahuman Sheriff
16:00-16:30	Moderated Panel Discussion	Orgs. TBD
16:30-16:45	**Break**	
	Breakout Discussions – identifying pre-competitive challenges	**Moderators**
16:45-17:45	Group 1 | In-person: Combination Therapy Group 2 | In person: Omics data integration ---------- Group 3 | Online: Combination Therapy Group 4 | Online: Omics data integration	Grp1. Cristina Santini Grp 2. Rahuman Sheriff (+Henning) ---------- Grp 3. Blerta Shtylla Grp 4. TBD
17:45-18:15	Feedback from Breakout Discussions	
18:15-18:30	**Final discussion/Wrap-up Day 1**	
	NETWORKING (venue TBD)	
18:30-19:00	Transit to venue for dinner	
19:00-21:30	**Drinks Reception & Dinner**	

Day Two: Tuesday 26th April 2022

Time	Presentation	Speaker/moderator
09:00-09:30	**Arrival/Registration**	
09:30-09:40	Welcome – Day 2	
09:40-09:55	Overview of Day 1	Edgardo Ferran
	Theme 3: Living drug products	**Chair** | Alexander Ratushnyy
09:55-10:20 10:20-10:30	Assessing the Impact of CAR T Memory, Effector, and Exhausted Cell State Dynamics on Lymphoma Patient Trajectories through Mechanistic Modeling Q&A	Liam Brown
10:30-11:00	**Break**	
11:00-11:25 11:25-11:35	**Novartis use case** Cellular Kinetic-Pharmacodynamic Modeling Approaches for Chimeric Antigen Receptor T-Cell (CAR-T) Therapies Q&A	Anwesha Chaudhury (by zoom)
11:35-12:00 12:00-12:10	**Takeda use case** Role of Mathematical Modeling of Cell Therapies Q&A	Lulu Chu (by zoom)
12:10-12:15	**Short Break**	
12:15-12:45	Moderated Panel Discussion	Orgs. TBD
12:45-13:00	Breakout groups – define pre-competitive space Zoom breakouts for online attendees	All
13:00-14:00	**LUNCH**	
	QSP COLLABORATIVE SPACES	**Chair** | Marcus Tindall
14:00-14:30 14:30-14:40	FDA speaker/Talk title TBD Q&A	Jane Bai (by zoom)
14:40-15:00 15:00-15:15	Current outlook for funding and Consortia opportunities Q&A & General Discussion	Henning Hermjakob and/or others (TBC)
15:15-15:30	**Wrap-up main workshop event and next steps**	Organisers

15:30-15:45	**Break**	
	Developing ideas & partnerships for collaboration	
15:45-16:00	Objectives & desired outcomes	Lourdes/Marcus
16:00-17:00	Discussion: formulate and capture ideas for proposals & collaboration	Rahuman Sheriff
17:00-17:30	**Wrap-up and next steps**	Organisers
17:30	**End of workshop**	

EMBL-EBI organisers

Effie Mutasa-Gottgens: effie@ebi.ac.uk | Edgardo Ferran | Rahuman Sheriff

Organisers & collaborators

Lourdes Cucurull-Sanchez, **GSK** | James Yates, **GSK** | Marcus Tindall, **Reading University** | Giovanni Di Veroli, **AstraZeneca** | Alexander Ratushnyy, **Bristol-Myers Squibb** | Javier Estrada Díez, **Novartis** | Peter Bloomingdale, **Merck** | Brian Topp, **Merck** | Cynthia Musante, **Pfizer** | Blerta Shtylla, **Pfizer** | Cristina Santini, **Roche**

Background & Motivation

Quantitative Systems Pharmacology (QSP) modelling and analysis is now a consolidated discipline, and the UK QSP Network is leading in helping to shape best practice for QSP modelling. The EMBL-EBI is already involved in developing approaches to decipher systems biology in oncology, while in the pharmaceutical industry, immuno-oncology is a key area of therapeutic interest for drug discovery and development. The proposed workshop therefore presents an opportunity for the EMBL-EBI, UK QSP Network and Pharma Industry to engage in cutting edge scientific discussions, with a view to identifying and developing pre-competitive research.

Scope

The workshop will not be exclusively focused on modelling but will also include presentations from experimental researchers as well as demonstrate translation and application of QSP modelling in practice. It will be important to demonstrate the value of QSP and to improve knowledge of the associated challenges of using QSP approaches as for example when developing experimental systems for pre-clinical applications. Topics proposed for the workshop are therefore as follows:

Theme 1: Combination therapies

- Rationale
- How well defined are the represented systems
- Selected modalities

Theme 2: Omics data integration

- Inference of QSP networks from prote(omics) data
- Approaches for integrating omics data for QSP modelling

- QSP Model validation

Theme 3: Living drug products

- Overview of QSP modelling applications
- How to validate QSP models

Anticipated workshop outcomes

- Raise awareness of QSP impact and needs in the immune-oncology space
- Share methodologies and resources available in academia, CROs and public institutions
- Define how the EMBL-EBI and UK QSP Network can best contribute to the development of QSP in immune-oncology
- Foster interactions that can lead to future collaborations, e.g. to form a wide Immuno-oncology consortium, explore funding opportunities and potentially write a joint grant proposal for QSP application in immune-oncology
- Write a perspective article on the future of QSP in immune-oncology and drug discovery
- Continue to provide a sense of community amongst QSP practitioners and customers in immune-oncology.

About EMBL-EBI and the EMBL-EBI Industry Programme

The EMBL-EBI (European Bioinformatics Institute) is part of EMBL and is an intergovernmental not-for-profit organisation whose primary mission is to freely provide data and resources to all aspect of the scientific community.

The EMBL-EBI Industry Programme is a subscription-based programme for global companies that make significant use of the data and resources provided by EMBL-EBI as a core part of their R&D. Member companies represent most of the top 20 pharmaceutical companies as well as several major agri-food, nutrition and healthcare companies. The programme is unique, providing regular quarterly strategy meetings, expert-level workshops on topics prioritised by the members, webinars and other activities. www.ebi.ac.uk/industry/workshops

By agreement with the Industry Programme members, EMBL-EBI is able to reimburse the travel and other costs of academic speakers and speakers from not-for-profit organisations subject to the EMBL rules on travel and reimbursement.

Travel & accommodation

Information is available on this page: http://www.ebi.ac.uk/about/contact#getto