SUMMER SCHOOL 2021

Dates: June 1st, June 2nd, June 8th and June 9th 2021, each day from 13:00 to 17:00 CET
Venue: Online meeting
Virtual host: Radboud university medical center, Nijmegen, The Netherlands
Lecturers: Dr. Kim Wever, Dr. Thomas Steckler, Prof. Malcolm Macleod, Prof. Martin Michel, Dr. Anton Bespalov

Day-to-day program

Day 1 (Tuesday June 1st)

	Why are we here? The context and rationale of the need to improve research rigour	
Time	**Topic**	**Tutor**
Pre-read /do	- Ioannidis 2005 - Nuzzo 2015 - SYRCLE's E-learning on systematic reviews	
13:00 - 13:15	Introductions, agenda and workshop objectives	Kim Wever
13:15 - 14:00	**Lecture** - Evidence for lacking rigor in research *i.a. meta-research, PPV and the Ioannidis paper, surveys of current practices and the reproducibility discussion*	Thomas Steckler
14:00 - 14:20	**Poll and discussion** - The origins of lacking rigor in research *i.a. competition, pressure to publish, lack of tolerance to negative data, risks of bias, lack of training and dichotomous decision making*	Thomas Steckler
14:20 - 14:40	**Lecture** - The impact of lacking rigor in research *i.a. ethics, patients, reputation of individual scientists, monetary (society, funders, scientists), intellectual property and good research practice versus research integrity*	Thomas Steckler
14:40 - 15:10	**Discussion** - Who is in the greatest need of higher research quality standards: industry, academia, CROs, young scientists or mature researchers? *Includes brief homework assignment: the research integrity policy of your institution*	Anton Bespalov
15:10 - 15:25	Coffee break, networking and remaining questions	All
15:25 - 16:10	**Lecture and quiz**: Systematic reviews: a tool to identify factors important for research quality	Kim Wever
16:10 - 16:55	**Practical assignment**: Assessing internal validity and risks of bias in primary animal studies	Kim Wever
16:55 - 17:00	Challenge question day 1	Anton Bespalov

Day 2 (Wednesday June 2nd)

	How to improve the robustness of animal studies: **study design and planning**	
Time	**Topic**	**Tutor**
Pre-read	- Dirnagl 2020 - Bert et al 2019 - Lefevre and Balice-Gordon 2020	
13:00 - 13:15	**Discussion** of the day 1 challenge question	Martin Michel
13:15 - 14:00	**Lecture and quiz**: How to define knowledge-claiming research? *i.a. exploratory versus confirmatory research, attributes of knowledge-claiming research (must and should) and factors that prevent implementation of maximal possible rigor*	Martin Michel

Time	Topic	Tutor
14:00 - 14:15	**Discussion**: Should these standards apply to in vitro research? To what extent?	Martin Michel
14:15 - 14:45	**Lecture**: Pre-specification *i.a. researcher's degrees of freedom, inclusion & exclusion criteria and preregistration*	Anton Bespalov
14:45 - 15:00	**Discussion**: (Electronic) lab journals - what they are and why are they important?	Anton Bespalov
15:00 - 15:15	Coffee break, networking and remaining questions	All
15:15 - 16:00	**Lecture**: practical aspects and challenges of blinding & randomization	Anton Bespalov
16:00 - 16:15	**Discussion**: When and how can research rigor measures be harmful?	Anton Bespalov
16:15 - 16:55	**Lecture**: The importance of statistical power *i.a prevalence of underpowered studies, when power becomes critical, biological versus experimental units and technical versus biological replicates*	Martin Michel
16:55 - 17:00	Challenge question day 2	Martin Michel

Day 3 (Tuesday June 8th)

How to improve the robustness of animal studies: **data integrity and analysis**		
Time	**Topic**	**Tutor**
Pre-read	- Motulsky 2014	
13:00 - 13:15	**Discussion** of the day 2 challenge question	Martin Michel
13:15 - 13:45	**Lecture**: Practical aspects of effect size estimation (do's and don'ts)	Martin Michel
13:45 - 14:00	**Discussion**: Effect size estimation troubleshooting *e.g. what to do when no prior studies are available, or the therapeutic relevance of an effect size is unknown?*	Martin Michel
14:00 - 15:00	**Lecture**: From pre-specified endpoints to data analysis: Common mistakes and how this affects data robustness	Kim Wever
15:00 - 15:15	Coffee break, networking and remaining questions	All
15:15 - 15:30	**Discussion**: Why do we need to keep raw data?	Kim Wever
15:30 - 16:20	**Lecture**: Data integrity *i.a. raw data, the ALCOA principles and the FAIR principles*	Kim Wever
16:20 - 17:00	**Discussion**: - How to set-up unique study IDs? - How to trace back published data to raw data? - How to archive data?	Anton Bespalov
16:55 - 17:00	Challenge question day 3	Anton Bespalov

SUMMER **S**CHOOL **2021**

Day 4 (Wednesday June 9ˢᵗ)

	What to do next? Practical implementation of measures to improve research rigour	
Pre-read /view	- ARRIVE 2.0 guidelines with explanations (separate file) - Videos introducing EQIPD Quality System: Why (Part 1), What (Part 2), and How (Part 3)	

Time	Topic	Tutor
13:00 - 13:15	**Discussion** of the day 3 challenge question	Thomas Steckler
13:15 - 13:45	**Lecture and poll**: Publication standards *i.a. ARRIVE and minimum information reporting standards*	Thomas Steckler
13:45 - 14:30	**Lecture**: Presenting data in publications (bar graphs, approaches to inference, etc.)	Malcolm Macleod
14:30 - 14:45	**Discussion**: What if the editor or reviewers request data to be presented in a "conventional way"?	Malcolm Macleod
14:45 - 15:15	**Lecture and poll**: Negative results: What are they and what do we do with them?	Thomas Steckler
15:15 - 15:30	Coffee break, networking and remaining questions	All
15:30- 16:00	**Lecture**: The EQIPD Quality System *i.a. introduction using a series of examples and implementation options*	Anton Bespalov
16:00 - 16:15	**Discussion**: Why does quality matter for you (referring to the EQIPD slide deck)?	Anton Bespalov
16:15 - 16:45	Surveys, feedback, closing remarks & adjourn	Kim Wever