

## Designing More Efficient and Reliable Studies

### WORKSHOP

Friday  
29<sup>th</sup> Nov.  
2019

09:00 - 17:00

Campus Biotech  
Room H8.01 D  
Chemin des Mines 9  
1202 Geneva

- 09:00 – 09:15** Welcome and Introduction
- 09:15 – 11:00** Overview of hypothesis testing from a Neyman-Pearson Perspective.  
Which question does a hypothesis test answer?  
Explanation of Type 1 and Type 2 error rates.  
**Practical Assignment:** Justifying error rates.
- 11:00 – 11:15** *Coffee break*
- 11:15 – 13:00** Why the scientific literature is biased, how we know this, and what an unbiased literature should look like.  
**Practical Assignment:** Evaluating the evidence in mixed results.  
The Question: What would falsify your hypothesis? How can we specify falsifiable predictions?  
How do you determine your smallest effect size of interest based on just the sample size you can collect?  
**Practical assignment:** Determining the Smallest effect size of interest.
- 13:00 – 14:00** *Lunch break*
- 14:00 – 15:30** Approaches to sample size justifications. Planning for Power. Simulation-based Power Analyses. Sequential analyses: How can you design studies by repeatedly collecting data without inflating error rates? Justifying error rates.  
**Practical Assignment:** Simulation Based power analysis for ANOVA designs.
- 15:30 – 15:45** *Coffee break*
- 15:45 – 17:00** What are strong or weak hypothesis tests? How can you examine null effects? Equivalence tests, Bayesian Rope, Bayes factors.  
**Practical assignment:** Equivalence testing: How do you perform an equivalence test? How do you calculate the power for a test aimed at showing the absence of a meaningful effect?

Swiss Doctoral School in Affective Sciences  
**swissuniversities**