2017: Open Science and Reproducibility Series

Open Data
Open Science
Open Mind
### Open Science Goals

- Transparency in experimental methodology, observation, and collection of data
- Public availability and reusability of scientific data
- Public accessibility and transparency of scientific communication
- Using web-based tools to facilitate scientific collaboration

Dan Gezelter, [http://www.openscience.org/blog/?p=269](http://www.openscience.org/blog/?p=269)
Workshop I

« Animal Systematic Review and bias detection as tools for proper experimental design »

17 March 2017

Dr. Sylvie Vullioud (SIS)
Dr. Lucile Vogt (SIS)
Dr. Cécile Lebrand (UNIL/CHUV)
Lecture I: Systematic Reviews

Systematic Review of Animal Studies Demo

(Dr. S. Vullioud, Dr. Lucile Vogt)

2 HRS

- How systematic review helps for experimental design and science validity
- Formulating a suitable and specific research question
- Developing literature search strategies
- Risk of bias assessment
PRACTICAL WORKSHOP I:

SYSTEMATIC REVIEW OF ANIMAL STUDIES: METHODOLOGY (4 HRS)

Dr. Sylvie Vullioud
Dr. Lucile Vogt
Dr. Cécile Lebrand

Systematic Review (SYRCLE)

- Pubmed/Zoreto

Publication risk of bias Review (RoB)

- Internal validity
- External validity
Workshop II
Experimental Design
7 June 2017

Dr. Romain-Daniel Gosselin (BiotelligenceS)
Lectures II: Experimental design

“Improving experimental design in basic and clinical research for increased science reproducibility”

(Dr. R-D. Gosselin, BiotelligenceS)

2 Hrs

- Importance of biostatistics and design in reproducibility
- Introduction to statistics
  (Sampling methodology/ Replication/ Independence/ Controlling bias/ Power and sample size/ Outlook of statistical tests/ Interpretations of p-values/ Data dredging)
- Null results and publication bias
Practical Workshop II: Experimental Science (2 hrs)

**Understand:**
Existing guidelines in experimental science
Pseudo replication in the lab
Confounding variables
Importance of pilot studies
Inflation of Type I and Type II errors

**How to:**
Estimate sample sizes
Reduce sample sizes
Increase power
Blind in experimental research
Block / stratify in the lab

Publish “negative” results
Read publications
Perform post-publication peer-reviewing

Practical Workshop II: Clinical Research (2 hrs)

**Understand:**
Existing guidelines in clinical science
Observational studies
Clinical trials
Safety vs. Efficacy
Non-inferiority and equivalence

**How to:**
Increase power in clinical science
Reduce the impact of confounders
Reduce bias in patient enrolment
Block / Stratify in clinical science

Read clinical publications
Perform post-publication peer-reviewing
Workshop III

Data Management & Open Data

22 May 2017
Lectures III: Data Management

1. SNSF policy on open research data
   (Dr. Sarah Gerster)

2. Big Data management
   (Dr. Mark Ibberson, VitalIT/SIB)

3. Data Management Plan
   (A. Dieudé, EPFL)

**Data Management**
- Increased the quality of your data
- Prevent the loss, preserve the accessibility and reuse of your data
- Ensure the integrity and reproducibility of your research work
- Reinforce the relevance of your research
- Fulfillment of funding mandate (DMP directives FNS, H2020,..).
Lectures III: Open Data


2. Data Paper
   (Scientific Data-Nature)

3. Research Data Repositories
   (figshare & Zenodo)

4. Article Versionning (authorea)

- Benefits to data sharing
- Policies for open data from funding agencies/publishers
- Guideline and standards for improving studies reproducibility
- Deposit of datasets accompanying the publication
- Versionning of article manuscript
Workshop IV

Data Management & data Sharing

Regular workshops Under Preparation at EPFL and FBM/CHUV

Dr. C. Lebrand & J. Zbinden (FBM/CHUV)
M. Rege (IUMSP) & C. Jambé (unil)
A. Dieudé & J. Krause (EPFL)
Practical Workshop: Data Management Plan (3 hrs)

A. Dieudé & Jan Krause (EPFL)

M. Rege (IUMSP)
Carmen Jambé (UNIL/UNIRIS)

Data management plan (DMP).

- requirements of the financing agencies (FNS/H2020).
- anticipate in detail the management of your research data (analyses, organization, storage, security and sharing).
- specify the type of data.
- Process to be followed in respect of budget, intellectual property, and monitoring over time.
Practical Workshop IV: Data Sharing (4 hrs)

Dr. Cécile Lebrand (FBM/CHUV)
Jérôme Zbinden (FBM/CHUV)
Jan Krause (EPFL)

- Search for datasets
- Benefits to data sharing
- Publish and share data on Zenodo & figshare
- Metadata standards
- File formats for long-term preservation/re-use
- Citation for a dataset
- Confidentiality and intellectual property