

WORKSHOP II

EXPERIMENTAL DESIGN

7 JUNE 2017

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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