Experimental Failures - Termination of Bad Projects

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70 Faculty
- Cancer biology
- Immunology
- Metagenomics
- Neurobiology
- Metabolic Disorders

IT
- HPC/Storage Mgmt
- Cloud
- LIMS
- Analytics

Jax Mice Clinical & Research Svcs
- Clinical Genomics
- LAH

20 Scientific Services
- GT/SCG
- Microbiome
- MNBF
- CBA
- GRS
- PDX
- Cell Eng/MAB
- ............
Prevention is better than cure.

~ Desiderius Erasmus
Experimental Failure has hues and colors

- Library Prep Failure
- Sample Contamination/Degradation/Mislabeling
- Bioinformatic Failure
- Experimental Failure
- Sequencing Failures
- Capture/Hybridization Failure
Experimental Failures can affect all aspects of project to varying degrees...

- Insufficient power
- Confounding
- Design
- Inference failure
- Analysis & Inference
- Poor quality
- Poor coverage
- Incorrect/insufficient data
- Scheduling failures
- Planning failure
- Scope failures
- Data
Strategies to identify and terminate bad projects?
Multi-Point QC to spot experimental failures

Sample Review
- LIMS data
- Library-prep QC
- Bioinformatics QC
- Contamination Analysis
- Reagent batches
- Cohort review
- Adapter and identifier review
- Supply batch review

Design Review
- Power analysis
- Batch identification
  - Mfr or Tech lab
  - Batch confounding
- Cohort composition analysis (FFPE vs Frozen)

Computational Tool Review
- Abrupt tool/scheduler termination
- Tool & Parameters
Sample Review

- LIMS data
- Library-prep QC
- Bioinformatics QC
- Contamination Analysis
- Cohort review
- Supply/Lab batches
- Adapter and identifier review

Corrected samples
Marginal samples
Bad samples
Account in the analysis
Design Review

Power analysis
- Acceptable/No drop
  - Mfr or Tech lab
    - Sample Collection
      - Sample Bias
- Unacceptable drop

Batch identification
- Mfr or Tech lab

Batch confounding
- Biological effect >> batch effect
- Biological effect ~< batch effect

Cohort composition analysis (e.g. FFPE vs Frozen)
- Sufficient no of frozen samples
- Large no of FFPE samples
- In sufficient sample size

Proceed
Proceed w/ Caution
Terminate
Who wants to sign-off another check?
Strategies to negotiate termination of bad projects!

- Data quality metrics & Design evaluation
- Coordination with Technologists and PIs
- Financial/Resource accountability
  - Limit free time for projects
- Experienced staff to provide oversight and conduct conversations on direction of project, possibly termination of it
- Seek opinion and help from experienced and influential computational faculty colleagues
Acknowledgements
THANK YOU

Q&A