



Computational Biology and Genomics Workshop

Todos Santos Center
May 9-12, 2022



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Learning objectives

- Use UNIX and the command line interface.
- Design genomics experiments.
- Handle and manipulate genomics datasets.
- Analyze genomics data.
- Visualize genomics data.

Schedule

Monday May 9: Introduction to high-throughput sequencing, computational biology, and code management

- 09:00-09:30 Arrival and Check-In
- 09:30-10:30 Introduction to Todos Santos and Group Discussion [slides]
- 10:30-11:00 High-Throughput Sequencing Technologies [slides]
- 11:00-12:00 UNIX and Command Line Tools (part I) [slides]
- 12:00-13:00 Lunch
- 13:00-14:00 UNIX and Command Line Tools (part II)
- 14:00-15:00 Code Management (GitHub)
- 15:00-17:00 Workflow Manangement (Snakemake) [slides]

Tuesday May 10: RNA-seq

- 08:00-08:45 Breakfast
- 09:00-12:00 RNA-seq Data Analysis I [slides]
- 12:00-13:00 Lunch
- 13:00-17:00 RNA-seq Data Analysis II

Wednesday May 11: Genomic analysis tools

- 08:00-08:45 Breakfast
- 09:00-10:00 Discussion on Experimental Design
- 10:00-12:00 Manipulating and Obtaining Genomics Data
- 12:00-13:00 Lunch
- 13:00-14:30 Alignment and Read Mapping
- 14:30-16:00 Assembly and Annotation
- 16:00-17:00 Variant Calling
- 18:00-20:00 Workshop Dinner

Thursday May 12: Data Visualization

- 08:00-08:45 Breakfast
- 09:00-11:00 Local BLAST and Comparative Genomics
- 11:00-12:00 Introduction to R, R Markdown, and Data Visualization [slides]
- 12:00-13:00 Lunch
- 13:00-14:30 Plotting Genomic Data with R and ggplot
- 14:30-15:00 Figure Drawing in R
- 15:00-16:00 Circular Representations of Genomic Data with Circos
- 16:00 End of workshop

<https://dbsloan.github.io/TS2022/>