



# Computational Genomics

An Advanced level Immersion Course for Investigators at UAB

May 6<sup>th</sup>-9<sup>th</sup>, 2019 from 9:00-12:30pm

**\$50- Faculty, \$25-Post Doc and Fellows, \$10 -Students/Staff**

**Location: Finley Conference Center  
720 20<sup>th</sup> St. S, Birmingham, AL 35233**

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*This course will provide the end user with a better knowledge of how to analyze their Genomics data using various Linux (command line) based analytical tools. Hands-on activities include analyzing whole genome for causal variants, transcriptome for gene expression, and epigenetics for calling peaks in ChIP/ATAC-Seq.*

## **Learning Objectives:**

1. Learn how to use Linux/Unix command line tools to analyze Next Generation Sequencing (NGS) data (whole genome/exome, transcriptome, epigenome).
2. Identify causal variants from whole genome/exome NGS data using Broad's Genome Analysis Toolkit (GATK) Best Practices guidelines.
3. Identify significant genes being regulated in transcriptome studies.
4. Call and annotate peaks from ChIP-Seq and ATAC-Seq studies.

**Schedule:**

	Monday, May 6	Tuesday, May 7	Wednesday, May 8	Thursday, May 9
<b>9:00 – 10:00</b>	Introduction to UNIX/LINUX and Virtual Machine for Data Analysis  <b>Dr. David Crossman</b>	Whole Genome Sequencing: Aligning Raw Reads  <b>Dr. David Crossman</b>	Whole Genome Sequencing: Identifying causal variants using various databases  <b>Dr. David Crossman</b>	Transcriptome: Pathway Analysis of Significant Genes  <b>Dr. David Crossman</b>
<b>10:15 – 11:15</b>	Accessing and Submitting Jobs on UAB's Compute Cluster, Cheaha  <b>Dr. David Crossman</b>	Whole Genome Sequencing: Preparing aligned reads with GATK  <b>Dr. David Crossman</b>	Transcriptome: Aligning Raw Reads  <b>Dr. David Crossman</b>	Epigenetics: Aligning Raw Reads for ChIP/ATAC-Seq  <b>Dr. David Crossman</b>
<b>11:30 – 12:30</b>	  <b>Dr. David Crossman</b>	Whole Genome Sequencing: Calling Variants with GATK  <b>Dr. David Crossman</b>	Transcriptome: Estimating transcript abundances and differential expression  <b>Dr. David Crossman</b>	Epigenetics: Calling/Annotating ChIP/ATAC-Seq peaks  <b>Dr. David Crossman</b>

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