

NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Biotechnology - NOC:Next Generation Sequencing Technologies: Data Analysis and Applications

Subject Co-ordinator - Prof. Riddhiman Dhar

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Next Generation Sequencing Technologies - 454 Sequencing
- Lecture 3 - Illumina Sequencing By Synthesis (SBS)
- Lecture 4 - Single Molecule Real Time (SMRT) Sequencing
- Lecture 5 - Ion Torrent and Nanopore Sequencing
- Lecture 6 - Sequencing Coverage, Quality Score and Experiment Design
- Lecture 7 - Data Formats
- Lecture 8 - Data Formats (Continued...)
- Lecture 9 - Data Quality
- Lecture 10 - Data QC and Trimming
- Lecture 11 - Hands-on: Setting up the system
- Lecture 12 - Basic Shell Commands
- Lecture 13 - Data Download and Exploration
- Lecture 14 - Hands-on 1 - Data exploration and QC
- Lecture 15 - Hands-on 1 - Data QC and Trimming
- Lecture 16 - Read Mapping
- Lecture 17 - Mapping Algorithms
- Lecture 18 - Suffix tree-based mapping algorithm
- Lecture 19 - Burrows-Wheeler Transform (BWT)
- Lecture 20 - Read Mapping with BWT
- Lecture 21 - Bowtie2 tool
- Lecture 22 - Mapping reads with Bowtie2
- Lecture 23 - Bowtie2 output
- Lecture 24 - SAM and BAM format
- Lecture 25 - SAM format: Alignment section
- Lecture 26 - Variant Calling
- Lecture 27 - Calling SNP/SNVs and Indels
- Lecture 28 - Hands-on analysis : Variant Calling
- Lecture 29 - VCF Files

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- Lecture 30 - Variant Annotation
- Lecture 31 - Analysis of CNVs and SVs
- Lecture 32 - Introduction to RNA sequencing
- Lecture 33 - RNA-seq data processing pipeline
- Lecture 34 - Transcriptome Assembly and Quantification
- Lecture 35 - Transcript Abundance Quantification
- Lecture 36 - Biases in RNA-seq experiments
- Lecture 37 - Data Normalization Methods
- Lecture 38 - Data Normalization Methods (Continued...)
- Lecture 39 - Differential Gene Expression (DGE) Analysis
- Lecture 40 - DGE analysis results and visualizations
- Lecture 41 - Multiple hypothesis testing correction
- Lecture 42 - FDR correction and interpretation of DGE analysis results
- Lecture 43 - Functional Enrichment Analysis
- Lecture 44 - RNA-seq data analysis - Hands-on 2
- Lecture 45 - Hands-on 2: Setting up the system
- Lecture 46 - Hands-on 2: Preliminary Data Analysis
- Lecture 47 - Sample Specific Bias Correction
- Lecture 48 - Differential Gene Expression Analysis I
- Lecture 49 - DGE Analysis with spike-ins
- Lecture 50 - DGE Analysis Results and Functional Enrichment Analysis
- Lecture 51 - Genome Assembly
- Lecture 52 - Shortest Common Superstring (SCS) assembly
- Lecture 53 - Overlap-Layout-Consensus (OLC) approach
- Lecture 54 - de Bruijn Graph (DBG) based assembly
- Lecture 55 - Assembly and Quality Control
- Lecture 56 - Applications of NGS in Epigenomics
- Lecture 57 - Detecting DNA Methylations
- Lecture 58 - Genome-wide Transcription Factor(TF) Binding Sites
- Lecture 59 - Chromatin Accessibility
- Lecture 60 - Genome Organization in 3D