Transcriptomics! A workshop on RNA-seq and its many uses

	Sunday 9/2/2020	Monday 10/2/2020	Tuesday 11/2/2020	Wednesday 12/2/2020	Thursday 13/2/2020
08:30-10:30	**Getting the data:** What can we use RNA-seq for? planning, library prep, other sequencing platforms, FASTQ, estimated costs (Eyal & Daniel)	**Starting simple - bacterial transcriptomics:** Mapping to a genome, quantifying expression, pathway enrichment (Daniel)	**Eukaryotic transcriptomics:** Mapping spliced RNA, alternative splicing, quantifying expression of alternative isoforms (Eyal)	***De novo* transcriptome assembly:** Assembly of RNA-seq data, alternative splice isoforms Annotation (Maya)	*Guest lecturer:* **Shahar Alon** (Faculty of Engineering, Bar Ilan University) The next genomic revolution? the promise and challenges of spatial genomics
10:30-11:00	Coffee break				
11:00-13:00	*Guest lecturer:* **Liat Linde** (Technion Genomics Center) Transcriptomics — bulk and single-cell	*Guest lecturer:* **Erez Levanon** (Faculty of Life Sciences, Bar Ilan University) A-to-I RNA editing — immune protector and transcriptome diversifier	*Guest lecturer:* **Gil Ast** (Department of Human Molecular Genetics, Tel Aviv University) How chromatin and epigenetics regulate alternative splicing	*Guest lecturer:* **Ran Elkon** (Department of Human Molecular Genetics & Biochemistry, Tel Aviv University) Multi-faceted analysis of transcriptomic data	*Guest lecturer:* **Smadar Ben Tabou de Leon** (Department of Marine Biology, University of Haifa) Comparative studies of developmental gene expression
13:00-14:00	Lunch (on your own)				
14:00-16:00	**Tutorial: Quality inspection and quality filtering** fastqc/multiqc, trimmomatic (Mark)	**Tutorial: Genome mapping, quantitation, normalization** STAR (annotated genome), IGV, DEseq, FPKM (Assaf)	**Tutorial: Differential expression analysis** DEseq (multiple factors), M/A & volcano plots, FDR, NMDS, Heatmaps (Osnat)	**Tutorial: Functional enrichment analysis** clusterProfiler (Tal)	**Tutorial: Ordination and visualization** ggplot2 (Mark)
16:00-16:30	Coffee break				
16:30-18:30 Extra tutorials	**Beer and one-minute presentations**	**Tutorial** (continued)	**Tutorial** (continued)	**Tutorial: Transcript assembly** The new Tuxedo pipeline: HISAT and StringTie (Tal)	

Lectures: Room 4045 of the Terrace Building (בניין המדרגה)
Tutorials: Room 2007 of the Terrace Building (בניין המדרגה)