

# RNA-Seq Data Analysis

Dates: 7<sup>th</sup>-8<sup>th</sup> June 2018

Location: Room A, Wellcome Centre for Human Genetics

Tutors: Santiago Revale, Eshita Sharma, Ben Wright, Helen Lockstone (Bioinformatics Core)

## Course Information

This 2-day course is aimed at those who would like to learn how to process RNA-Seq data, and use R statistical software and BioConductor (<https://www.bioconductor.org/>) packages to perform analysis. The course will include overview lectures and practical sessions to demonstrate the key steps involved in getting from raw data to lists of differentially expressed genes. Emphasis will be on the need for careful evaluation of data and setting up an appropriate analysis model, as well as common pitfalls when using R to handle and analyse large-scale datasets. The accompanying 'Introduction to R' course is recommended for those who have not used R before. Alternatively, please see <https://software-carpentry.org/lessons/> for suitable online courses that can be completed in advance ('Programming with R' and 'The Unix Shell' modules).

Attendees will need to bring their own laptop with the R software (<https://www.r-project.org/>) and RStudio interface (<https://www.rstudio.com/products/RStudio/>) installed as well as have wireless internet access (<http://help.it.ox.ac.uk/network/wireless/services/eduroam/index>).

Course material will be available at this link shortly before the course:  
[http://www.well.ox.ac.uk/bioinformatics/training/RNASeq\\_June2018](http://www.well.ox.ac.uk/bioinformatics/training/RNASeq_June2018)

## Schedule

Thursday 7<sup>th</sup> June 2018

|               |                                                   |
|---------------|---------------------------------------------------|
| 10:00 – 10:10 | Welcome and introductory remarks (HL)             |
| 10:10 – 11:00 | Sequencing and data formats (SR)                  |
| 11:00 – 11:15 | Coffee Break                                      |
| 11:15 – 12.15 | Practical: Assessing quality of raw data (SR)     |
| 12:15 – 13:00 | Lunch break ( <i>note lunch is not provided</i> ) |
| 13:00 - 14:30 | RNA-Seq applications and tools (ES)               |
| 14:30 – 14:45 | Break                                             |
| 14:45 – 15:15 | Quality checks (QC) and data exploration (BW)     |
| 15:15 – 16:30 | Practical: Data QC (BW)                           |

Friday 8<sup>th</sup> June 2018

|               |                                                   |
|---------------|---------------------------------------------------|
| 10:00 – 11:00 | Development of technology and analysis tools (HL) |
| 11:00 – 11:15 | Coffee Break                                      |
| 11:15 – 12.45 | Gene expression analysis using R (HL)             |
| 12:45 – 13:30 | Lunch break ( <i>note lunch is not provided</i> ) |
| 13:30 - 15:00 | Practical: Differential gene expression (HL & BW) |
| 15:00 – 15:15 | Break                                             |
| 15:15 – 16:00 | Optional session to complete practical (HL & BW)  |