**Introduction to R**

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**Registration link:** XXX

**Hours of instruction:** 4

**Prerequisites:**

* Have R and RStudio installed
* Have a plain text editor

**Summary:**

R is a powerful language to perform data analysis and visualization. This beginner level workshop is a hands-on introduction to the basics of programming in R.

**Contents:**

1. **R basics (1h10 min)**
   1. The programming language *(20 min)*
      1. History and programming logic
      2. Setting up a working directory
      3. Syntax operators (<-,=,$,#)
      4. Creating variables
      5. Seeking help
      6. How to install a package (CRAN, BioConductor, GitHub)
   2. Data types and built-in functions *(30 min)*
      1. Vectors
      2. Factors
      3. Lists
      4. Data frames
      5. Arrays
   3. Hands-on *(20 min)*

*10 min BREAK*

1. **Basic data manipulation (1h30)**
   1. Reading/Writing data (10 min)
   2. Exploring data frames (25 min)
      1. Subsetting
      2. Splitting, joinning
   3. Useful packages for data manipulation (30 min)
      1. Manipulating data frames with *dplyr*
      2. *Janitor*, *DataTable*, *plyr,tidyr*
   4. Hands-on *(25 min)*

*10 min BREAK*

1. **Generating outputs (50 min)**
   1. Graphics (20 min)
      1. Creating basic plots with ggplot
   2. Reports with Knitr (10 min)
      1. Basic syntax
      2. Templates
   3. Hands-on 20min
2. **Concluding remarks (10 min)**