# Homework 2

## Genetics and bioinformatics

**Important dates:**
- Submit report and presentation files before <u>11 December 2016, 24:00h</u>
- The presentation will be on <u>13 December 2016</u>

**Marks:**
- Part 1 – 15 points
- Part 2 – 15 points

**Evaluation:**
- For report, your work will be evaluated based on the accuracy and completeness of answers and report structure.
- For presentation, you will be evaluated based on the completeness of slides, your presentation, your understanding, and your answers to questions.

**Instruction:**
- Form a group of 2-3 persons and complete the homework in both parts (1&2).
- For presentation, you have 15 minutes to present your work for each part and everybody in a group needs to present.
- A report and/or slides for presentation need to be submitted in electronic format via the website by the deadline. Please note that the submission system will be closed automatically.
- Compress all files into ONE zip file and submit to:

**http://www.student.montefiore.ulg.ac.be/~GBIO009-1/GBIO0002_sys/index.php**

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**Part 1:** Gene expression.

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<u>Select only ONE task from the list</u>

**A**: Select **ONE** of these questions to answer using a report format (introduction, discussion and conclusion sections).
- Compare (Pros and Cons) the microarray against NGS technologies in regards to gene transcriptomic analysis.
- Compare the Yeast two hybrid and mass spectrometry technologies to identify protein-protein interactions.

**B**: Select **ONE** of these papers to study and create a presentation. Your presentation should cover objective, method, result (if available), literatures (if needed), your own discussion, and your own conclusion.
- Zhu X, Gerstein M, Snyder M. Getting connected: analysis and principles of biological networks. Genes Dev. 2007 May 1;21(9):1010–24.
- Wolf JBW. Principles of transcriptome analysis and gene expression quantification: an RNA-seq tutorial. Mol Ecol Resour. 2013 Jul 1;13(4):559–72.

**Part 2:** Sequence analysis and interactions.

Select **ONE** of these papers to study and create a presentation. Your presentation should cover objective, method, result (if available), literatures (if needed), your own discussion, and your own conclusion.

- Qi Y. Random Forest for Bioinformatics. 2012 Jan;307–23.
- De R, Bush WS, Moore JH. Bioinformatics challenges in genome-wide association studies (GWAS). Methods Mol Biol Clifton NJ. 2014;1168:63–81.