

Course name: Epigenome data analysis

Lecturer: Prof. Tae-Young Roh, Ph.D.

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Day: 13-14th of Jan. 2020

Lecture outline:

Epigenetics refers to as a study of heritable changes in gene expression program or cellular phenotype that does not include genetic alterations in the DNA sequence. This lecture covers from the basic concept of epigenetics and recent technological progress adopting Next generation sequencing method. As a key gene regulatory mechanism, current epigenetic studies explain lots of unsolved biological issues affected by environmental ques. Histone modifications, DNA methylations, and microRNAs are major players to control the gene regulation program. In this course, we will learn the basics of epigenetic and practice how to process epigenome data produced from NGS technique.

Schedule

| | Time | content | lecturer | Lecture type |
|--------------|----------------------------|--|----------------------------------|--------------|
| Day 1 | Session 1 (09:00-10:30) | Epigenetics overview | Tae-Young Roh | Lecture |
| | (10:30-10:45) | Break | | |
| | Session 2 (10:45-12:15) | Next generation sequencing technology | Tae-Young Roh | Lecture |
| | | Lunch | | |
| | Session 3 (13:30-15:00) | How to handle ChIP-Seq data I (Histone modifications) | Tae-Young Roh and Byung Hee Kang | Lab |
| | (15:00-15:15) | Break | | |
| | Session 4 (15:15-16:45) | How to handle ChIP-Seq data II (Histone modifications) | Tae-Young Roh and Byung Hee Kang | Lab |

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| Day 2 | Session 5 (09:00-10:30) | Recent case studies I | Tae-Young Roh | Lecture |
| | (10:30-10:45) | Break | | |
| | Session 6 (10:45-12:15) | Recent case studies II | Tae-Young Roh | Lecture |
| | | Lunch | | |
| | Session 7 (13:30-15:00) | Enhancer identification and Motif discovery | Tae-Young Roh and Byung Hee Kang | Lab |
| | (15:00-15:15) | Break | | |
| | Session 8 (15:00-15:15) | Gene regulatory network construction | Tae-Young Roh and Byung Hee Kang | Lab |