

## Course description

### High throughput technologies in drug discovery (2 CFU)

#### Program of the course

Today, translational research requires a broad range of research interests from single gene analysis to the analyses of protein networks. The analysis of thousands of samples in parallel with high quantitative and statistical accuracy is currently possible due to the development of high throughput (HT) technologies in genomics, proteomics, and cell biology. Many basic questions could not be addressed due to the lack of HT technologies. The number of academic sites establishing HT platforms for drug discovery has increased dramatically all over Europe during the past ten years, mostly due to a reduction in the cost of equipment, a contraction of pharmaceutical early stage research programs, and increased collaboration among consortia constituted by government grant agencies, academic institutions, pharmaceutical companies, and private research foundations.

This course will give an overview of the main HT technologies, strategies and goals pursued in drug discovery and biomedical research in academic environments.

#### - HT technologies in biomedical research and drug discovery (8h).

To approach today's research challenges in biotechnology and translational pharmacology, several types of High Throughput (HT) technology platforms have been established. In this part of the course we will focus on the underlying general approaches and clarify technical issues regarding:

**HT technologies in genomics and proteomics** with particular regard to their use in drug discovery and biotechnology.

**HT imaging platforms in drug discovery:** High throughput microscopy from single cell analysis to systems biology; applications in drug discovery, toxicology, and biomarker analysis.

In this section we will analyze issues relating to the planning and development of a HT screening project, from the choice of the cell-based assay to the design of the screen, drug library choice, probe selection, and drug screening strategies.

- **HT Screening applications in detail (8h):** Successful application of HT technology in drug screening and biomarker identification will be presented in the form of an open discussion session by teachers and students to highlight strategies, critical points and achievements. When possible (a minimum of 10 students must register), groups of 2-3 students will be engaged in a practical course that requires planning and application of HT microscopy in drug discovery to be performed in open lab sessions.

#### Lecturer

**Dr. Antonella Ragnini-Wilson**

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