BIO-488

Scientific project design in translational oncology

De Palma Michele, Hanahan Douglas, Radtke Freddy

Cursus	Sem.	Type
Bioengineering	MA1, MA3	Opt.
Life Sciences Engineering	MA1	Opt.
Sciences du vivant	MA1, MA3	Opt.

Language of teaching	English
Credits	5
Withdrawal	Unauthorized
Session	Winter
Semester	Fall
Exam	During the semester
Workload	150h
Weeks	14
Hours	**5 weekly**
Courses	2 weekly
Exercises	3 weekly
Number of positions	**20**

It is not allowed to withdraw from this subject after the registration deadline.

Remark

only one registration per student to a scientific thinking course

Summary

The theme of the course is the role of inflammation in cancer. It focuses on the regulation and multifaceted functions of tumor-associated inflammatory cells, and how they promote or oppose cancer.

Content

The theme of this course is the role of inflammation in cancer. It focuses on the regulation and multifaceted functions of tumour-associated inflammatory cells, and how they promote or oppose cancer. The course starts with a short introduction by the teachers, who illustrate the focus of the course and the learning objectives. In the following classes the students analyse, present and discuss research papers that have been agreed with the teachers. The final 3-4 classes are dedicated to the design of a project in translational oncology.

- *Part I – Journal clubs.* The students develop an encyclopedia of the various inflammatory cell types and subtypes that have hallmark-promoting or antagonizing capabilities. Macrophages, neutrophils, myeloid-derived suppressor cells, natural killer and T cells – or subsets thereof – are defined and discussed. For each cell type/subtype, the students describe and discuss known strategies, genetic or pharmacological, to either impair the cell of interest or reprogram its functions in tumours.
- *Part II – Project design.* The students design a pre-clinical study that can guide or incentivize clinical trials aimed to ablating or reprogramming a cell of interest in a suitable cancer type.

Keywords

Inflammation; Cancer; Immunity; Macrophage; Myeloid cell; T-cell; Tumor-promoting function; Tumor-antagonizing function; Mouse model of cancer; Cell reprogramming; Pre-clinical trial;
Clinical trial.

Learning Prerequisites

Recommended courses

Cancer biology I and II

Learning Outcomes

By the end of the course, the student must be able to:

- Design pre-clinical trials that can guide clinical trials
- Analyze presents and critically discuss the results of scientific papers
- Describe the main characteristics and functions of the different inflammatory (immune) cell types/subtypes that are recruited to tumors
- Discuss the mechanisms whereby the distinct inflammatory (immune) cell types/subtypes regulate multiple hallmarks of cancer
- Describe strategies (experimental or clinical, genetic or pharmacological) to interfere with the functions of the cells of interest and/or reprogram them from a tumor-promoting to a tumor-antagonizing activity.

Resources

Bibliography

Hanahan and Weinberg, *Hallmarks of cancer : The next generation* (Cell, 2011)

Ressources en bibliothèque

- Hallmarks of cancer: the next generation / Hanahan