

BIO-488

Scientific project design in translational oncology

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Cursus	Sem.	Type
Bioengineering	MA1, MA3	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	12

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

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 course will start with a short introduction by the teachers, who illustrate the focus of the course and the learning objectives. In the remaining classes the students will analyze, present and discuss research papers that have been agreed with the teachers.

Part I – Develop an encyclopedia

The students develop an encyclopedia of the various inflammatory cell types and subtypes that have hallmark-promoting or antagonizing capabilities. Macrophages (i), neutrophils (ii), myeloid-derived suppressor cells (MDSCs), T cells (iv) – or subsets thereof – will be defined

and discussed with respect to their tumor-promoting or antagonizing functions.

Part II – To kill or reprogram?

For each cell type/subtype, the students describe and discuss known strategies – genetic or pharmacological – to either kill the cell of interest or reprogram its functions in tumors.

Part III – Translation to cancer therapy

For each cell type/subtype, the students design pre-clinical studies that can guide or incentivize clinical studies aimed at ablating or reprogramming the 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

- 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](#)