**GIGA Cancer**

The global aim of the GIGA-Doctoral School Cancer course is to take advantage of the stimulating academic and scientific environment to provide a foundation of knowledge in cancer biology, inspire innovative front-line cancer research, give a solid background to become independent investigators and inform on the clinical challenges in the treatment of cancer patients.

***Specific objectives:***

* to update PhD candidates on the current challenges in the field of cancer biology
* to update PhD candidates on hot research topics in the field of cancer biology
* to give a basis on methodological and technical issues
* to stimulate the development of participants’ critical thinking skills
* to improve their capacity to capture the essential (take home) message in publications and seminars, even not related to their main topic of interest.

**Target group**: PhD candidates in the beginning of their PhD trajectory; group is limited to 20 participants

**Prerequisites:** working knowledge of English; familiarity with cell organisation, human genome, genetics, immune system and immune response

**Duration of the course and workload:** one week, 40 hours. The course time includes lectures, discussions, exercises and self-study

**Location:** GIGA B34, +5

**Educators:** Yvette Habraken, Vincent Bours, Bernard Rogister, Alain Chariot, Michael Herfs, Franck dequiedt, Nor Eddine Sounni, Akeila Bellahcène, Ingrid Struman, Nathalie Jacobs, Christine Gilles, Pierre Frères, Guy Jerusalem, Agnès Noël and Pierre Close.

(GIGA – Cancer, GIGA – MBD, GIGA – Neuroscience, GIGA – Medical Genomics; University of Liege)

**Coordination:** Agnès Noël & Pierre Close

**Course program:**

The course will be organized around the following modules:

**Module 1**: **Dysregulation of cancer cells**

Genome instability, sustained proliferation, evading growth suppression, replicative immortality, resisting cell death, cell metabolism, cancer signalling, cancer stem cell

**Module 2: Tumor environment**

Tumor promoting inflammation, escape to immune destruction, cancer-associated fibroblasts, tumor niche

**Module 3: Invasion, metastasis**

Epithelial to mesenchymal transition, (lymph)-angiogenesis, pre-metastatic niche concept, exosomes in cancer

**Module 4: Clinical challenges**

Current treatments and challenges, resistance/adaptation of tumors to treatment

**The course schedule:**

**Day 1: Introduction and Module 1-Partim 1**

**9:00- 12:30**

1. Quiz on global topics related to different aspects in cancer biology

2. Lecture: Hallmarks of cancer (Lecturers: Pierre Close, Agnes Noel)

**13:30 – 17:00**

Lecture 1: Genetics of cancer, genome instability, clonal evolution, introduction to clinical aspects (Lecturer: Vincent Bours)

Lecture 2: Cancer signalling, workshop on experimental models and future therapies (Lecturer: Pierre Close)

**Day 2 Module 1-Partim 2**

**9:00-10:45** Lecture: Replicative immortality, resisting cell death, cell metabolism, cancer signalling, cancer stem cell (Lecturers: Franck Dequiedt and Nor Eddine Sounni)

**11:00-15:00** Self-study: reading papers per group

**15:30-17:00** Presentation by participants (10 minutes/group) and discussion with moderators

**Day 3: Module 2**

**9:00-10:45** Lecture: Tumor environment, inflammation and immune regulation (Lecturers: Alain Chariot and Ingrid Struman)

**11:00- 15:00** Self-study: reading papers per group

**15:30-17:00** Presentation by participants (10 minutes/group) and discussion with moderators

**Day 4: Module 3**

**9:00-10:45** Lecture: Invasion, metastasis and angiogenesis (Lecturers: Agnès Noël and Christine Gilles)

**11:00- 15:00** Self-study: reading papers per group

**15:30-17:00** Presentation by participants (10 minutes/group) and discussion with moderators

**Day 5: module 4**

**9:00-10:45** Lecture: Current treatments and clinical challenges in cancer - Success stories and failure in drug development? (Lecturers: Pierre Frères and Guy Jerusalem)

**11:00- 15:00** Self-study: reading papers per group

**15:30-17:00** Presentation by participants (10 minutes/group) and discussion with moderators

Discussions on hallmarks of cancers as target for treatment