BIO 224 - The Biology of Cancer

Instructor
Estelle Chamoux, PhD
Office: Johnson 310
Phone: 819-822-6666 #2555
Email: echamoux@ubishops.ca

Schedule
• Lectures TH, 10:00-11:30, N112
• Office hours: TH, 12:30-14:00 or by appointment

Textbook
• It is highly suggested to have a Cell Biology textbook to use as a reference
• Use the material provided on Moodle (course slides, suggested readings)
• For those who want to go further, you can refer to the book entitled « The biology of cancer » by R. A. Weinberg (Garland Sciences Ed.)

Evaluation
1. Quizzes and participation, 30%
2. Homeworks, 30%
3. Final Exam (see format down), 40%
4. Format:
   • Quizzes: Short written test with 10 quick-answer questions; Duration = half an hour
   • Homeworks: Case studies will be given for analysis at home. Questions will include material taught in class and research in scientific papers and/or databases. Students will be given two weeks to complete the work. Emphasis is put on understanding the course material, on deducing mechanistic concepts, as well as on establishing links between different concepts.
   • Final exam: Critic of a breaking news on cancer, in groups of 2 students. Students will first have to find a newspaper article and/or TV news broadcast related to cancer or cancer
research. You have to form your group and give your starting material to me before Jan. 31st. Then you will have to research on this discovery in order to formulate a critic of the paper (or whatever format you chose as your starting material). The critic includes a scientific description of the discovery presented, with the cellular and molecular mechanisms involved. This will require that you give the scientific context, rephrase, criticize (indicate weaknesses and forces of the paper, novelty of the material presented) and eventually correct what is presented (sometimes papers in the news make shortcuts that render the scientific content wrong or misleading). The critic will have to be presented in a written work of 3-4 pages (due two weeks before the end of classes). Your work will be distributed to two other groups (each group will have to read two papers from their peers). Then the critic will have to be presented orally at the end of classes (or final exam date) and the two groups who have read the paper will have to ask at least one question about the critic and/or the starting paper. In this work, emphasis is put on knowledge and understanding of complex concepts and on critical thinking. Marks will be given on the choice of the article (5%), on the quality of the critic (thoroughness of research and critic, clarity of the material presented and ease of reading, 20%), oral presentation (5 min, powerpoint allowed but not necessary, 10%), questions (5%).

Topics under study

• Introduction to cancer
• Cellular and molecular basis of cancer:
  • The nature of cancer
  • Tumor viruses, cellular oncogenes and growth factors
  • Apoptosis and the control of cell populations
• Genomic stability:
  • Role of p53 and DNA repair mechanisms
  • Environmental causes of DNA damage
  • Moving elements, mutations leading to cancer
  • Genetics of cancer: inheritance, risks and screening
• Cancer progression:
  • Multistep tumorigenesis
  • Tumor immunology and escape strategies
  • Therapeutic strategies and research
• Selected examples of cancer:
  • Non-malignant tumors
  • Hormone-dependent cancers: breast, prostate
  • Cancers with many body effects: gastric tumors, pituitary and adrenal tumors
  • Cancers with environmental/lifestyle causes: lung, GI tract