Master/3d year engineer 6 months RESEARCH INTERNSHIP
From January 2024

Impact of tumoral extracellular vesicles on energy metabolism during colorectal cancer-associated cachexia

Period: 6 months from January/February to June/July 2024
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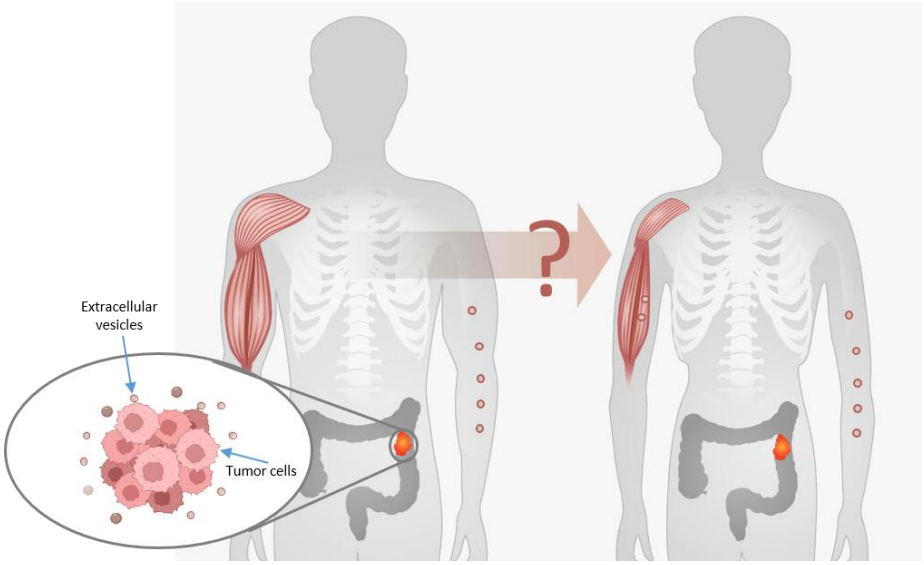
Internship locations: Institut de Recherche en Cancérologie de Montpellier, INSERM U1194, www.ircm.fr

Summary
Colorectal cancer (CRC) is the second leading cause of cancer death in developed countries. Up to 60% of CRC patients suffer from cachexia. Cachexia is a syndrome characterized by loss of weight and muscle mass, with or without loss of body fat, increasing the CRC mortality rate. The mechanisms responsible for the development of cachexia associated with CRC remain poorly understood. A better understanding of the communication between metabolic tissues and the tumor is a clear and unmet need in oncology. Extracellular vesicles (EVs) are circulating particles naturally produced by cells, which enable the transfer of biological material (DNA, RNA, proteins, lipids, etc.) between tumor cells and normal cells. EVs produced by colorectal cancer cells inhibit the metabolism of recipient myoblasts *in vitro* and induce muscle wasting *in vivo*. The transcriptional coregulator RIP140 is a major regulator of colorectal tumorigenesis and metabolism. Interestingly, both adipose and muscle tissues affected by cachexia are target tissues for RIP140, and we have found RIP140 mRNA in the EVs of CRC cells. Our hypothesis is that RIP140 excreted by EVs from colorectal tumors would influence the activity of distant metabolic tissues and play a protective role against the development of CRC-associated cachexia. This Master's research project aims to detect RIP140 in EVs produced by CRC cells and to study its biological impact on cellular metabolism, in particular muscle metabolism.



Student work
The Master student will carry a targeted and integrated approach in order to detect the presence of RIP140 in EVs secreted by colorectal cancer cells at the protein level. He or she will use the cellular models available in the team in which RIP140 expression is modulated to follow the transfer of exosomal RIP140 into recipient cells. Finally, the impact of exosomal RIP140 on recipient cell metabolism will be assessed by Seahorse analysis.

Skills acquired:
1. Project management with several laboratories
2. Purification of extracellular vesicles from cancer cells by differential centrifugation
3. Basic cellular biology
4. Metabolism analysis

Required skills and soft skills
1. Scientific English, knowledge of cancer biology will be appreciated
2. Autonomy, scientific curiosity, rigor
3. Good interpersonal skills, ability to report