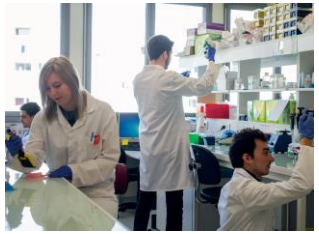


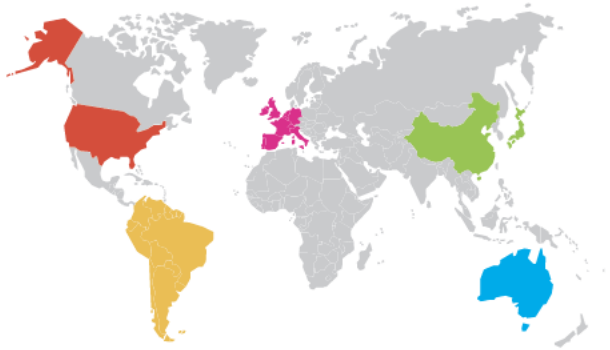
CRCL CANCER RESEARCH CENTER OF LYON

France

Director Dr. Patrick Mehlen - Dep. Dir. Dr. Charles Dumontet

- **Strong translational research** to enable patients to rapidly benefit from breakthroughs in basic research.
- Bridge from "**bench to bedside**" through a strong collaboration between clinicians and pathologists with CRCL teams
- **Continuity between basic research and clinical applications**.

International Collaborations



- **25** National and International Student Exchange Programs
- Average foreign Ph.d Students & Post-docs. **58** per year
- **15** European & International Grants

- United States of America **35**
- Europe **59**
- Asia **14**
- Australia **7**
- North America **5**
- South America **2**

TERI DEPARTMENT

- Tumor Immune Cancer and development
- OncoPharmacology
- Molecular Regulation Cancer Immunity
- Cancer cell plasticity Melanoma
- Integrated analysis Immuno-regulation
- TGF-beta

24 RESEARCH TEAMS

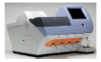
500 STAFF

> 350 Publications per year

CITI DEPARTMENT

- Hepatitis Viruses Chronic Liver DiseaseU+0073
- Cell death Childhood cancers
- Senescence Cancer and Aging
- Inflammasome Cancer
- Cancer cell death
- Ribosome Translation and cancer

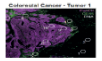
Clinical Research



Cancer genomic platform

Translational Research

Center for drug discovery



Research pathology

Basic Research

Single cell platform

Cytometry

Bioinformatics

Cell imaging platform

Animal Facility

https://www.crcl.fr/en/home/

Inserm — La science pour la santé / From science to health

Lyon 1

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CENTRE DE LUTTE CONTRE LE CANCER LEON BERARD

“Cancer Cell Death” team

Team presentation

“Cancer Cell Death” team was set up in October 2016 when Dr. G. Ichim was recruited as a young team leader following a competitive international call from the LabEX DEVweCAN (University of Lyon). In the following year, INSERM CSS1 also recruited him as Junior Researcher (CRCN). This team integrates the department of Cancer Initiation and Tumor Cell Identity (CITI) at the CRCL where it brings its expertise in mitochondrial-driven apoptosis, caspase activation, autophagy/mitophagy and early tumourigenesis, while mastering different microscopy techniques.

Searching for its unique research niche where it can make a difference, **“Cancer cell death” team launched several projects aiming to establish how cancer cells hijack cell death and its effectors (mainly caspases and mitochondria) to fuel certain oncogenic hallmarks (such as aberrant proliferation or invasion)**.

Webpage: https://www.crcl.fr/en/citi-department/cancer-cell-death/

Key words

Cell death, apoptosis, mitochondria, lysosomes, caspases, epigenetics, metastasis, migration, invasion, zebrafish

Supervisor contact

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Lab publications

https://pubmed.ncbi.nlm.nih.gov/?term=ichim+G&sort=pubdate

“BMP, Ecosystem, stemness and dynamic in cancer” team

Team presentation

The projects of our lab focus on Bone Morphogenetic Protein (BMP) family members, stem cells, and the tumor niche. We study the effect of the tumor environment on Cancer Stem Cells (CSCs) and their resistance to treatment, using epithelial tumour models and haematopoietic models. Our approach relies on analyzing and modulating the expression of these BMP family members and characterizing their functions.
We are developing projects subjecting cancer stem cells to different conditions, which will allow us to evaluate the impact of their interactions with the microenvironment on their ability to resist treatment.
We are also studying the functional consequences, in terms of drug response, of interactions between CSCs and cellular or structural components of the tumor niche, by integrating the physical and environmental parameters with, for example, the mechanical constraints.

Webpage: https://www.crcl.fr/en/citi-department/bmp-ecosystem-stemness-and-dynamic-in-cancer/

Key words

BMP, microenvironment, heterogeneity, biomechanics, stem cells

Supervisor contact

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Lab publications

https://pubmed.ncbi.nlm.nih.gov/?term=veronique+maguer-satta+OR+sylvain+lefort+OR+boris+guyot+OR+eve-isabelle+pecheur&sort=date&size=100

“Epigenetics, microenvironment and liver cancer” team

EpiLiCan

The team studies

- the epigenetic changes that precede and accompany hepatocellular carcinoma (HCC) development and progression
- the molecular and immunological basis of hepatitis B and D virus (HBV/HDV) pathogenicity and persistence

Axis I: Histone methyltransferases (HTMs) as HCC epi-drivers and therapeutic targets

a) **Gene networks controlled by G9a and PRC2/EZH2 in normal and neoplastic liver cells**
b) **OGT and EZH2 in the epigenetic modulation the HCC transcriptome**
c) **EZH2 and DNp73 interplay in the regulation of stemness in hepatic progenitor cells**
d) **Epigenetic regulators (EZH2, G9, lncRNAs) and the gut microbiome in HCC development, progression and response to multikinase inhibitors (MKIs) and immune checkpoint inhibitors (ICIs)**

Axis II: Molecular and immunological determinants of HBV/HDV persistence

a) **Impact of cytokines, exosomes and microvesicles produced by phenotypically defined subpopulations of virus-specific CD4 and CD8 exhausted T cells on cccDNA**
b) **Identification of HDV host direct target genes**

Axis III: Translational research

a) **Circulating HBV RNAs (including spliced HBV RNAs) to predict HBV functional cure and HCC**
b) **Role of HBV integration in the early step of hepato-carcinogenesis**
c) **Serum miRNAs and circRNAs circulating to that predict HCC development in patients at risk**
d) **Circulating miRNAs in acute decompensation of cirrhosis ± sepsis**
e) **Molecular signatures (mRNAs, lncRNA, miRNAs, tumor immune infiltrate) predicting HCC recurrence after orthotopic liver transplantation**

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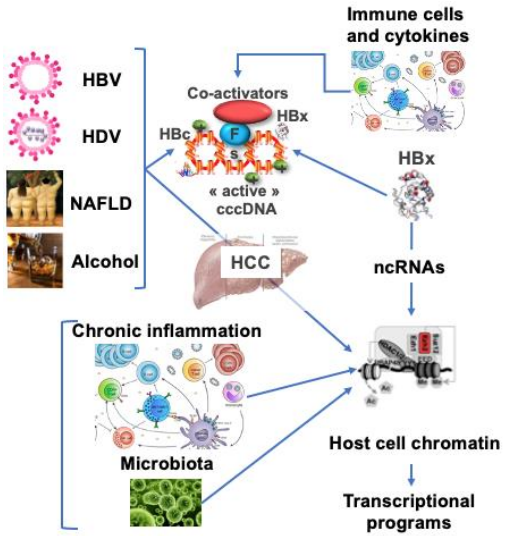
Lab publications

https://pubmed.ncbi.nlm.nih.gov/?term=massimo+levrero+OR+claude+caron+de+fromentel+OR+mirjam+Zeisel&sort=date&size=100



Webpage: https://www.crcl.fr/en/citi-department/epigenetics-microenvironment-and-liver-cancer/

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“Genetics, Epigenetics and Biology of sarcomas” team

Team presentation

The detection of a specific molecular alteration together with the pathologist’s analysis enables the classification of most sarcomas. Nevertheless, as numerous sarcomas remain labelled “unclassified” by the pathologists, the “translational” objective of our team is to identify molecular features that may improve diagnosis. When a new recurrent alteration is found in tumors with similar clinical and pathological characteristics, a new sarcoma subtype could be defined. Therefore, the “fundamental” objective of our team is to elucidate the function(s) of these fusion genes or at least of some of them. We are currently focusing on the most common of the rarest sarcoma subtypes that remain understudied, namely CIC-Fused sarcomas, BCOR-rearranged sarcomas, mesenchymal chondrosarcomas and high grade endometrial stromal sarcomas. We are investigating the function of the fusion gene by studying their interactome, their impact(s) on transcription (most gene fusions are aberrant transcription factors) and signaling pathway dysregulations they may provoke. Interestingly, most of the fusion genes identified in these sarcoma subtypes are involved, directly or indirectly, in chromatin remodeling, a mechanism responsible for facilitating chromatin accessibility (favoring the opening/closing of chromatin). The determination of how the fusion genes lead to such deregulation and how we could abolish it are the main aims of our researches.

Webpage: https://www.crcl.fr/en/citi-department/bmp-ecosystem-stemness-and-dynamic-in-cancer/

Key words

Sarcomas, fusion genes, epigenetics

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Lab publications

https://pubmed.ncbi.nlm.nih.gov/?term=tirode+F