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Rôle des protéines matricielles dans l'hypoxie et l'angiogénèse / *Role of matrix proteins in hypoxia and angiogenesis*

Centre interdisciplinaire de recherche en biologie (CIRB)

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CIRCUITS NEURONAUX ET COMPORTEMENT /
NEURAL CIRCUITS AND BEHAVIOR

Responsable : Alexander FLEISCHMANN

RECHERCHE

Page web : <https://www.college-de-france.fr/site/en-cirb/fleischmann.htm>.

RÔLE DES PROTÉINES MATRICIELLES DANS L'HYPOXIE
ET L'ANGIOGÈNESE / *ROLE OF MATRIX PROTEINS IN HYPOXIA
AND ANGIOGENESIS*

Responsable : Stéphane GERMAIN

RECHERCHE

Page web : <https://www.college-de-france.fr/site/en-cirb/germain.htm>.

The sequence of biological events that permits an organism to maintain tissue viability in hypoxia remains poorly understood. Variations in oxygen concentration lead to respiratory, metabolic and vascular adaptations in tissues. How hypoxic endothelial cells (EC) integrate chemical signals with mechanical cues from their local tissue microenvironment in order to produce functional capillary networks that exhibit specialized form remains an open question. A key role of hypoxia in the regulation of many endothelial functions (Ferratge *et al.*) is nevertheless well established and growing evidence show that angiogenesis, defined as the events leading to blood vessels formation by sprouting or growth of preexisting vessels, can be triggered by hypoxia, both during development and in pathological conditions such as in muscle (Latroche *et al.*; Gitiaux *et al.*), in cardiovascular ischemia (Bouleti *et al.*; Garcia *et al.*) and tumors (Bousseau *et al.*). Our team is also interested in understanding how angiogenesis and vascular integrity are regulated in hypoxic conditions. We are also analyzing ECM composition, deposition, posttranslational modifications and rearrangement by ECs. We studied how vascular ECM is organized and scaffolded to provide structural support for blood vessels and described how it regulates endothelial cell and pericyte functions and how it is required for proper vascular morphogenesis and maintenance of vascular homeostasis (Germain *et al.*; Marchand *et al.*).

PUBLICATIONS

BOULETI C., MONNOT C. et GERMAIN S., « ANGPTL4, a multifaceted protein at the cross-talk between metabolism and cardiovascular disorders », *International Journal of Cardiology*, vol. 256, 2018, p. 2, DOI : 10.1016/j.ijcard.2017.10.123.

LATROCHE C., WEISS-GAYET M., MULLER L., GITIAUX C., LEBLANC P., LIOT S., BEN-LARBI S., ABOU-KHALIL R., VERGER N., BARDOT P., MAGNAN M., CHRÉTIEN F., MOUNIER R., GERMAIN S. et CHAZAUD B., « Coupling between myogenesis and angiogenesis during skeletal muscle regeneration is stimulated by restorative macrophages », *Stem Cell Reports*, vol. 9, n° 6, 2017, p. 2018-2033, DOI : 10.1016/j.stemcr.2017.10.027.

GITIAUX C., LATROCHE C., WEISS-GAYET M., RODERO M.P., DUFFY D., BADER MEUNIER B., GLORION C., NUSBAUM P., BODEMER C., MOUCHIROUD G., CHELLY J., GERMAIN S., DESGUERRE I. et CHAZAUD B., « Myogenic progenitor cells exhibit IFN type I-driven pro-angiogenic properties and molecular signature during juvenile dermatomyositis », *Arthritis & Rheumatology*, vol. 70, n° 1, 2018, p. 134-145, DOI : 10.1002/art.40328.

ÉVOLUTION ET DÉVELOPPEMENT DES CELLULES GERMINALES /
EVOLUTION AND DEVELOPMENT OF GERM CELLS

Responsable : Jean-René HUYNH

RECHERCHE

Pages web : <https://www.college-de-france.fr/site/en-cirb/huynh.htm> et
<http://germcells.fr>.

PUBLICATION

CLÉMOT M., MOLLA-HERMAN A., MATHIEU J., HUYNH J.-R. et DOSTATNI N., « The replicative histone chaperone CAF1 is essential for the maintenance of identity and genome integrity in adult stem cells », *Development*, vol. 145, n° 17, 2018, DOI : 10.1242/dev.161190.

MODÈLES ALÉATOIRES POUR L'INFÉRENCE DE L'ÉVOLUTION
DU VIVANT / *STOCHASTIC MODELS FOR THE INFERENCE
OF LIFE EVOLUTION (SMILE)*

Responsable : Amaury LAMBERT

RECHERCHE

Page web : <https://www.college-de-france.fr/site/en-cirb/lambert.htm>.

Dirigée par Amaury Lambert (professeur à Sorbonne Université), l'équipe SMILE regroupe des mathématiciens et des biologistes de l'évolution (quatre chercheurs titulaires et huit non titulaires).