Master 2 Reproduction et Développement
Stage de recherche 2026-2027

Prénom et NOM de l'encadrant : Céline GUIGON

Téléphone : 01 53 73 96 03

Mail : celine.guigon@u-paris.fr

Prénom et NOM du/de la responsable d'équipe : C Guigon

Intitulé de l 'équipe d'accueil : Intitulé de l'équipe d'accueil : : Fonctions Placentaire et Reproductive, Microbiote pré et post-natal (FPRM), UMR-S1139

Site internet de l'unité :

Prénom et NOM du/de la directeur·rice du Laboratoire ou de l'Unité : Thierry Fournier

Adresse du Laboratoire ou de l'Unité : 4 avenue de l'Observatoire, Paris 6ème

Résumé du thème de recherche de l'équipe d'accueil:

The INSERM UMR-S 1139 unit is conducting research on several topics focused on placental function, the maternal and perinatal microbiome, and the endocrine regulation of female fertility and ovarian disorders. One of the team's research areas focuses on the study of mini-puberty in females, a developmental period occurring after birth and characterized by significant activation of the hypothalamic-pituitary-ovarian (HPO) axis. The research aims to understand the mechanisms underlying this activation, as well as its short- and long-term consequences for reproductive health in a physiological context, and also in the context of pre-term birth when activation of HPO is further increased.

Titre du projet de stage : Impact of prematurity on mini-puberty and female fertility: studies on mouse models

Projet de stage : (une vingtaine de lignes maximum)

Preterm birth is increasingly recognized as a risk factor for long-term reproductive disorders in women, including infertility and premature ovarian insufficiency (POI), a condition characterized by early depletion of ovarian follicles before the age of 40. Although the mechanisms underlying this association remain unclear, growing evidence suggests that disruptions in the postnatal maturation of the hypothalamic-pituitary-gonadal (HPG) axis may play a central role. In particular, the period of "mini-puberty," a transient activation of the HPG axis occurring during the first months of life, is marked in girls by elevated gonadotropin and estradiol levels that promote early follicular activity. In preterm infants, this hormonal activation is exaggerated and occurs earlier than in term-born infants, potentially leading to abnormal follicular recruitment, impaired oocyte maturation, and accelerated depletion of the ovarian reserve. Recent work from our laboratory demonstrated that alterations in mini-pubertal gonadotropin levels can directly influence

reproductive lifespan in mice (Chester at al, 2025).

The objective of this project is to investigate the developmental mechanisms linking preterm birth to ovarian dysfunction and to explore a novel strategy for fertility preservation. Using murine models of prematurity, the project will first examine how early hormonal exposure affects ovarian reserve establishment, follicular dynamics, and oocyte quality. It will then evaluate whether transient suppression of gonadotropin stimulation during mini-puberty using a GnRH receptor antagonist can protect the ovarian reserve and improve adult fertility outcomes. Combining endocrine analyses, ovarian histology, molecular approaches, and fertility studies, this work aims to provide new insights into the developmental origins of female infertility associated with prematurity and to identify innovative early-life interventions to preserve fertility in women born preterm.

Techniques mises en œuvre par le stagiaire :

RNA-seq, bioinformatics-hormone measurements (ELISA), ovarian histology, immunofluorescence.

Publications du Responsable de stage au cours des 5 dernières années :

Degrelle SA, Deval G, Tête A, Mikolajczak C, Giton F, Vignaud ML, Boland S, **Guigon CJ**, Coumoul X, Zerrad-Saadi A, Golinelli-Cohen MP, Fournier T, Ferecatu I. Cerium dioxide nanoparticles coated with benzo[a]pyrene modify aryl hydrocarbon receptor activity, trophoblast differentiation and mitochondrial network phenotype in human placenta. Part Fibre Toxicol. 2025 Oct 14;22(1):25. doi: 10.1186/s12989-025-00640-x.

Cluzet V, Airaud E, Tete A, Devillers MM, Petit F, Leary A, Pierre A, Li H, Day CP, Weyemi U, Chauvin S, **Guigon CJ**. Pharmacological inhibition of SIRT1 limits the growth of tumoral and metastatic granulosa cells by impacting mTOR, Myc and E2F pathways. Mol Cancer Ther. 2025 Apr 1. doi: 10.1158/1535-7163.MCT-24-0957.

Chester M, Devillers MM, Corre R, Giton F, Souaré F, Petrovic CH, Airaud É, Quintas D, Mhaouty-Kodja S, Naulé L, **Guigon CJ.** Reduction in minipubertal gonadotropin levels alters reproductive lifespan and ovarian follicular loss in female mice. Hum Reprod. 2025 Apr 1;40(4):717-729. doi: 10.1093/humrep/deaf019.

Torres T, Parmentier C, **Guigon CJ**, Mhaouty-Kodja S, Naulé L. Effects of minipuberty disruption on the expression of sexual behavior in female mice. Sci Rep. 2024 Dec 28;14(1):31297. doi: 10.1038/s41598-024-82653-8.

Marie C, Pierre A, Mayeur A, Giton F, Corre R, Grynberg M, Cohen-Tannoudji J, **Guigon CJ**, Chauvin S. Dysfunction of Human Estrogen Signaling as a Novel Molecular Signature of Polycystic Ovary Syndrome. Int J Mol Sci. 2023 Nov 24;24(23):16689. doi: 10.3390/ijms242316689.

Devillers MM, François CM, Chester M, Corre R, Cluzet V, Giton F, Cohen-

Tannoudji J, **Guigon CJ**. Androgen receptor signaling regulates follicular growth and steroidogenesis in interaction with gonadotropins in the ovary during mini-puberty in mice. Front Endocrinol (Lausanne). 2023 Apr 19;14:1130681. doi: 10.3389/fendo.2023.1130681.

Devillers MM, Mhaouty-Kodja S, **Guigon CJ**. Deciphering the Roles & Regulation of Estradiol Signaling during Female Mini-Puberty: Insights from Mouse Models. Int J Mol Sci. 2022 Nov 8;23(22):13695. doi: 10.3390/ijms232213695.

Chauvin S, Cohen-Tannoudji J, **Guigon CJ**. Estradiol Signaling at the Heart of Folliculogenesis: Its Potential Deregulation in Human Ovarian Pathologies. Int J Mol Sci. 2022 Jan 3;23(1):512. doi: 10.3390/ijms23010512.

Cluzet V, Devillers MM, Petit F, Pierre A, Giton F, Airaud E, L'Hôte D, Leary A, Genestie C, Treilleux I, Mayeur A, Katzenellenbogen JA, Kim SH, Cohen-Tannoudji J, Chauvin S, **Guigon CJ**. Estradiol promotes cell survival and induces Greb1 expression in granulosa cell tumors of the ovary through an ERα-dependent mechanism. J Pathol. 2022 Mar;256(3):335-348. doi: 10.1002/path.5843.

Pierre A, Mayeur A, Marie C, Cluzet V, Chauvin J, Frydman N, Grynberg M, Cohen-Tannoudji J, **Guigon CJ**, Chauvin S. Estradiol Regulates mRNA Levels of Estrogen Receptor Beta 4 and Beta 5 Isoforms and Modulates Human Granulosa Cell Apoptosis. Int J Mol Sci. 2021 May 10;22(9):5046. doi: 10.3390/ijms22095046.

Autres informations:

Etudiants actuellement en thèse ou en M2 dans l'équipe d'accueil. Pour chaque étudiant indiquez le nom du responsable de thèse, l'année du début de la thèse et l'Ecole Doctorale de rattachement

Camille Dias, M2 ReproDev 2025-2026 Co-encadrement C Guigon/A Pierre
Noalig Wyckens, Thèse 2024-2027- ED BioSPC- CJ Guigon
Romane Person, Thèse 2024-2027- ED BioSPC, I Ferecatu

Etudiants ayant préparé ou soutenu leur thèse ou leur M2 dans l'équipe d'accueil au cours des six dernières années. Pour chaque étudiant indiquez le nom du responsable de l'étudiant, l'année du début de la thèse et de fin de la thèse, l'Ecole Doctorale de rattachement et le devenir de l'étudiant.

Lydia Benkhaled, M2 2024-2025-C Guigon/A Pierre
Johanne Curtat, M2 2023-2024, R Deli
Léa Telhadas, M2 2023-2024, ML Vignault et T Fournier
Léa Poinsignon : Thèse 2021-2024- ED BioSPC- J.L Beaudeux et A. Zerrad-Saadi
Mélanie Chester : Thèse 2021-2024- ED BioSPC- C Guigon
Bertrand Lefrère : Thèse 2022-2025- ED BioSPC- J.L Beaudeux et A. Zerrad-Saadi
Aurélia Jean-Baptiste, M2 2023-2024 : Christelle
Elodie Guesdon, M2 2019-2020 : Amal Zerrad-Saadi
Gaelle Deval, M2 2019-2020 : Ioana Ferecatu

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Nhut Thanh.Van, M2 2019-2020 : Sophie Gil
Amandine Weill M2 2019-2020 : Sophie Gil

Cette proposition de stage s'adresse-t-elle spécifiquement à un étudiant scientifique, médecin ou vétérinaire ou bien est-il ouvert à tous les profils ? tout profil

Ce sujet peut-il donner lieu à une thèse ? OUI