**Master 2 internship project**

**Year 2023-2024**

**Laboratory/Institute:** IAB **Director:** Pr Pierre Hainaut

**Team:** GETI: Genetic, Epigenetic and Therapy of

Infertility **Head of the team:** Dr Arnoult Christophe, Pr Pierre Ray

**Name and status of the scientist in charge of the project:** Dr Loeuillet Corinne **HDR: yes X no ☐**

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**Program of the Master’s degree in Biology:**

**☐** Microbiology, Infectious Diseases and Immunology **☐** Structural Biology of Pathogens

**x** Physiology, Epigenetics, Differentiation, Cancer **☐** Neurosciences and Neurobiology

**Title of the project: Amelioration of sperm fertilization competence by a radiological contrast agent**

Objectives (up to 3 lines):

The objectives of the stage will be to estimate if a contrast agent, used during hysterosalpingography in women, can directly impact the spermatozoa movement, their capacitation and thus their fertility competence.

Abstract (up to 10 lines):

Hysterosalpingography (HSG) radiological exam is mandatory in the context of the assisted reproductive technology proposed to infertile couple. HSG is used to evaluate women’ fallopian tubes permeability which can be directly responsible for the observed infertility. This exam can be done either with water-based (WCM) or oil-based (OCM) contrast media. Higher pregnancy rates have been reported for women whose HSG was performed with OCM. To decipher the underlying physiological mechanisms, we have established an animal model mimicking the OCM effect. One hypothesis is an amelioration of sperm fertilization competence. To validate, several physiological sperm parameters must be assessed and quantified in the presence of the OCM and compared to that of WCM. Sperm mobility, capacitation, and vitality, which can be directly related to the sperm fertilization capacity, have thus to be evaluated.

Methods (up to 3 lines):

Sperm mobility will be assessed by computer assisted sperm analysis (CASA). Sperm vitality will be quantified by using eosin-negrosin staining. Sperm capacitation status will be evaluated by flow cytometry, western blot and immunofluorescence.

Up to 3 relevant publications of the team:

[Pantoprazole, a proton-pump inhibitor, impairs human sperm motility and capacitation in vitro.](https://pubmed-ncbi-nlm-nih-gov.insb.bib.cnrs.fr/32609951/)

Escoffier J et al., Andrology. 2020 Nov;8(6):1795-1804. doi: 10.1111/andr.12855. Epub 2020 Jul 16.

[Spermaurin, an La1-like peptide from the venom of the scorpion Scorpio maurus palmatus, improves sperm motility and fertilization in different mammalian species.](https://pubmed-ncbi-nlm-nih-gov.insb.bib.cnrs.fr/27932550/)

Martinez G, et al., Mol Hum Reprod. 2017 Feb 10;23(2):116-131. doi: 10.1093/molehr/gaw075.

Requested domains of expertise (up to 5 keywords):

Physiology, cellular biology, biochemistry.