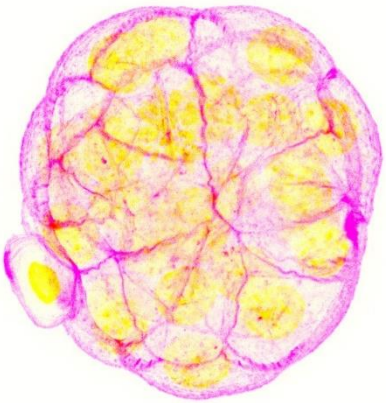
February 2026

Doctoral project on early mouse embryo development

in the **FERAL lab** (IRCAN) and in the **RAUZI lab** (IBV)
at the University Côte d'Azur, Nice, FRANCE

Dynamic role of SLC3A2 variants in murine embryo development

CD98hc/SLC3A2, highly expressed in proliferative cells, is a dual-function transmembrane protein, modulating integrin signaling through direct interactions, and acting as a chaperone for SLC7 amino acid transporter family. Sequencing data suggests the existence of previously uncharacterized CD98hc isoform. Our preliminary experiment using CRISPR/Cas9 genome editing to selectively KO the novel isoform showed lethality as early as 8-cell-embryo (compared with E3.5-9.5 for the original isoform). **The proposed PhD project aims to characterize the expression, molecular functions, and physiological roles of this novel CD98hc isoform *in vivo* in early mouse embryogenesis.** We will pursue isoform-specific genetic approaches (KO and fluorescent tag) to generate embryos specifically deficient in the novel isoform, as well as knock-in reporter lines. Preimplantation embryos will be analyzed from the zygote to blastocyst stages to assess developmental progression, lineage specification, and cell fate decisions. We propose to characterize and study the spatial and temporal dynamics of the novel isoform, and its impact on cell division, polarity, compaction, and morphogenetic movements. To do so, we will employ multi-view light sheet microscopy for live *in toto* imaging, for minimal phototoxicity, together with 3D+time big data processing and quantitative image analysis. Quantitative analyses of mechano-transduction, integrin signaling, and extracellular matrix organization will also be performed in developing embryos using immunostaining, traction force-related readouts, and transcriptional profiling. Together, these approaches will allow the identification of isoform-specific functions of CD98hc during early embryonic development and provide insight into how integrin-mediated signaling and amino acid transport contribute to early developmental decisions. The student will be supervised by CD98hc expert (FERAL - https://www.ircan.org/research/teams/chloe-feral/) and embryo live imaging expert (RAUZI - http://ibv.unice.fr/research-team/rauzi/).



We are seeking a highly motivated and talented candidate to develop this interdisciplinary PhD project. Send a CV, a motivation letter, master scores/ranking and reference letters to chloe.feral@univ-cotedazur.fr and matteo.rauzi@univ-cotedazur.fr

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