Màj 01/06/2020

UE 2.1. Current concepts in Precision Health **15 ECTS**

Parcours « *Precision Health* »

ST5: Mathematic modeling of living organisms

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Our knowledge of biological pathways is more and more complex, limiting full understanding of such pathways. To manage such amount of data, mathematical modeling of pathophysiological pathways is a relevant solution to enable a comprehensive integration of living organisms. This seminar will give the opportunity to student to interact with key leaders modeling biological processes including circadian rhythmicity, metabolism and pathophysiology of liver and diabetes. Beyond the use of mathematic modeling to predict pathophysiological behavior of a specific target, mathematic modeling is also used to correct imaging artefact due to body movement. This specific mathematic modeling is used to precisely target tumors in patients in real time using imaging-guided ultrasounds, X-Ray or electroporation.

Duration: 1 day

Program

Provisional schedule:

- **Introduction to dynamic system modeling.** **Marc Lefranc** *marc.lefranc@univ-lille.fr*
  Laboratoire de Physique des Lasers, Atomes, Molécules (UMR ULille/CNRS 8523) soutenu par Labex CEMPI et le projet I-SITE EPIC.

- **Mathematical models of circadian clocks: from equations to function.** **Marc Lefranc** *marc.lefranc@univ-lille.fr*
  Laboratoire de Physique des Lasers, Atomes, Molécules (UMR ULille/CNRS 8523) soutenu par Labex CEMPI et le projet I-SITE EPIC.

- **Modeling intestinal glucose absorption for diabetes precision.** **Cédric Lhoussaine** *cedric.lhoussaine@univ-lille.fr*
  Centre de Recherche en informatique, signal et automatique de Lille, UMR9189
  soutenu par EQUIPEX REALCAT.

- **Modeling bile acid metabolism.** **Natal van Riel** *N.A.W.v.Riel@tue.nl*
  Computational Biology, Eindhoven University of Technology, The Netherlands

- **The use of metabolic models in treatment of liver diseases.** **Adil Mardinoglu** *adilm@scilifelab.se*
  Science for Life Laboratory, Royal Institute of Technology (KTH), Stockolm, Sweden

- **On-line guidance of mini- and non-invasive therapies.** **Baudoin Denis de Senneville** *bdenisde@math.u-bordeaux1.fr*
  Modélisation pour l'oncologie (MONC), Bordeaux