**Training School Preliminary Programme**

**Introduction to Mathematical and Computational Modelling: from mouse to computer and back**

**17th - 19th January 2017**

**Eindhoven University of Technology, Eindhoven, the Netherlands**

**Outline of the Training School**

The training school provides an introduction to mathematical and computational modelling for scientists that work with animal models of disease. The training school aims to show how such techniques can contribute to biomedical research, in particular to integrate data and knowledge and facilitate translation of preclinical findings. It will also discussed how experiments are tailored to deliver data that is amenable for computation, and how modelling provides predictions and hypotheses as input for further experimental work. The participants will be exposed to some of the underlying mathematics, but the main focus will be on concepts and principles. The program is composed of lectures, hands-on computer practicals and research presentations. Computers with software are available**.**

**Confirmed Lecturers:**

* Natal van Riel (TU/e)
* Steven Niederer (King’s College London)
* Enrico Dall'Ara (University of Sheffield)
* Carly Taylor (ETH Zürich)

**Tuesday 17th January 2017**

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| **Session 1: Introduction** |

- Introductions

- Models and modelling: from animal model to mathematical model

* Why model?
* what is a good model?
* Models can look very differently

- How to talk to a modeler

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| **Session 2: Different Applications of Mathematical Models** |

- Models to test biological concepts

- Models to integrate and analyze experimental data

- Models to drive new experiments

- Models to predict

**Wednesday 18th January 2017**

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| **Session 3: Network Biology** |

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- Network models to analyze and visualize experimental data

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| **Session 4: Dynamic Models** |

- Introduction to differential equations; modeling and simulation

**Thursday 19th January 2017**

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| **Session 5: Integrating Data and Models** |

- From mouse to computer and back: data-based models and model-based experiments

- Model calibration and validation using experimental data

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| **Session 6: How does Computation Modelling fit with MouseAGE** |

- Working group 4 goals and purpose

- Case study: modelling frailty