



AMERICAN  
UNIVERSITY OF BEIRUT  
CENTER FOR ADVANCED  
MATHEMATICAL SCIENCES

# WORKSHOP ON MATHEMATICS FOR THE HEALTH SCIENCES

**October 25-26, 2022**

## **Program (Beirut time)**

### **Tuesday, October 25**

- 9:15am – 9:30am      Welcome notes
- 9:30am – 10:10am      **Ricardo Ruiz-Baier** (Monash University, Australia)  
*“Mixed Formulations for poroelasticity/free-flow using total pressure”*
- 10:20am – 10:30am      Short Break**
- 10:30am – 11:10am      **Benoit Perthame** (Sorbonne University and Laboratoire Jacques-Louis Lions, France)  
*“Structured Equations in Biology; Relative Entropy, Monge-Kantorovich Distance”*
- 11:20am – 11:35am      Contributed talk: **Reina Dannaoui** (Ecole Normale Supérieure, PSL, France)  
*“Modelling Neurotransmitter Release During Single Exocytotic Events for Deciphering Kinetic and Structural Information from Their Electrochemical Signature”*
- 11:40am – 11:55pm      Contributed talk: **Flavien Alonzo** (Ecole Centrale de Nantes, France)  
*“Simulating the behavior of Glioblastoma Multiforme based on patient MRI during treatment”*
- 12:00pm – 1:30pm      Lunch Break**
- 1:30pm – 2:10pm      **Nagaiah Chamakuri** (Indian Institute of Science Education and Research, India)  
*“Large Scale PDE Constrained Optimization of Cardiac Defibrillation”*
- 2:20pm – 3:00pm      **Francesco Regazzoni** (Politecnico di Milano, Italy)  
*“Regulatory Mechanisms in Cardiac Active Mechanics: from Microscale Models to Multiscale Numerical Simulations”*
- 3:10pm – 3:30pm      Coffee break**
- 3:30pm – 4:10pm      **Yves Coudière** (CARMEN-INRIA, Bordeaux University, France)

*“Modeling the Propagation of Cardiac Action Potential in Hearts with Structural Heterogeneities”*

4:20pm – 4:35pm **Contributed talk:** Michèle Romanos (Toulouse University, France)  
*“Multi-tissue viscous models for tissue growth: incompressible limit, qualitative behaviour at the limit, and applications to the elongation of the vertebrate embryo”*

### **Wednesday, October 26**

9:30 am – 10:10 am **Nader El Khatib** (Lebanese American University, Lebanon)  
*“Mathematical Modeling of Atherosclerosis”*

10:20 am – 11:00 am **Vitaly Volpert** (National Center for Scientific Research – France, RUDN – Russia)  
*“Mathematical Modelling of Respiratory Viral Infections”*

**11:10 am – 11:30 am Coffee break**

11:30 am – 12:10 pm **Mostafa Adimy** (INRIA, France)  
*“Modelling the Relationship between Antibody-Dependent Enhancement and Disease Severity in Dengue Infection”*

12:10 pm – 12:50 pm **Mostafa Bendahmane** (INRIA – Bordeaux University, France)  
*“Recent Progress on Homogenization of the Bidomain and Tridomain Models in Electrocardiology”*

**1:00pm – 2:30pm Lunch Break**

2:30pm – 3:10pm **Mazen Saad** (Ecole Centrale de Nantes, France)  
*“Asymptotic Behavior of Solutions of a Nonlinear Degenerate Chemotaxis Model”*

3:10pm – 3:25pm **Contributed talk:** Zahraa Taha (EDST-LU, Lebanon and Université de Poitiers, France)  
*“Existence of Solution to a Cahn-Hilliard Equation with Proliferation Term”*

**3:25pm – 3:35pm Short Break**

3:35pm – 4:15pm **Youcef Mammeri** (Jean Monnet University, France)  
*“Modeling Carcinoma Activation and Impact of Surgery”*

**4:25pm – 5:00pm Coffee break**

**5:00pm – 6:00pm Round Table Discussion**