

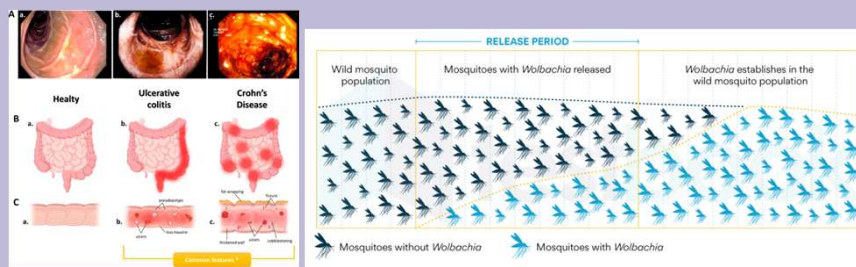
# Saoussen Latrach

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## Mathematical Analysis of the Blocking of invasion Phenomena; Applications to Inflammatory Diseases and Population Replacement

Chronic inflammatory bowel diseases (IBD) and mosquito-borne epidemics are major public health challenges. This presentation develops and analyses reaction-diffusion models to study propagation dynamics and the conditions leading to blockage in these biological systems. The first study focuses on ulcerative colitis (UC), an IBD characterised by continuous inflammation of the colon. We propose a mathematical model describing the interaction between a pathogen and the immune system, and we establish the existence of travelling waves representing inflammation spread in a homogeneous medium. We then derive conditions under which this propagation is blocked in a heterogeneous environment, and we validate these results through numerical simulations. The second study investigates a control strategy for mosquito-borne diseases via the spread of Wolbachia, a bacterium that reduces pathogen transmission such as dengue. We analyse the effect of spatial heterogeneity in carrying capacity and identify conditions leading to propagation failure, supported by numerical experiments.



↓参加登録はこちら↓



# 6月25日 (木) 17:00-18:20

武蔵野大学有明キャンパス, 4号館303教室, ハイブリッド開催

参加ご希望の方は、右上のQRコードより参加登録をお願いいたします。  
参加費無料 **登録締切: 6/24 (水)**

国際展示場駅 徒歩7分  
東京ビッグサイト駅 徒歩6分



コーディネーター: 佐々木 多希子 (武蔵野大学工学部数理工学科 准教授)

問い合わせ先: 武蔵野大学数理工学センター

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