

John Ward, Loughborough University, UK

Modelling of cold plasma treatment of biofilms

Biofilms are slimy colonies of bacteria growing on solid-fluid interfaces. Their natural resistance to anti-microbial agents causes considerable concern in medicine and industry. Cold plasma jets has been used for some years as a means of sterilising surfaces against bacterial biofilms and more recently this approach has been considered for use in medicine. The cold plasma jet itself does not penetrate very deep into the biofilms, but the byproducts that the jet creates do, and these do most of the damage.

In this talk we discuss a hybrid continuum/individual-based modelling framework designed to simulate biofilm growth in 2/3-dimensions, and describe how it can be extended to simulate the action of the plasma byproducts. Simulations will be presented investigating the effect of treatment in two experimental setups and at various stages of biofilm maturity. Key results from this analysis will be discussed.