Plenary talk (Mathematics and Medicine)

Decoding the Smart Strategies of Microbial Invaders: A Mathematical Perspective on Bacterial and Viral Infections

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Abstract

Although they are simple organisms, bacteria and viruses exhibit highly sophisticated behaviors that allow them to survive by developing resistance to treatments or evading the immune system. Understanding those 'smart' behaviors is crucial not only for developing effective treatments but also for predicting the future trajectory of infections in an ever-evolving microbial world. In this talk, we will build mathematical models to understand the remarkable strategies of those pathogens. The models are based on systems of partial differential equations coupled with ordinary differential systems. We address the development of the models, their theoretical properties, and their computational simulation, in an integrated manner.

References

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