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Mucosal rheology in disease transmission

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The biological complex fluid mucus plays a key role in the transmission of infectious diseases. In-host, mucus serves as a physical and biochemical barrier, excluding pathogens from reaching underlying susceptible cells. Externally, mucosalivary droplets transport pathogens between hosts, and transmission probability is intimately tied to the processes of aerosolization and virus stability in these biochemically rich droplets. In this talk, we will discuss our experimental and theoretical work related to mucosal rheology in both contexts. First, in the context of in-host barrier properties, we explore transport through mucus via our macrorheological and microrheological work in mucin gels, i.e. gels reconstituted from the primary macromolecular component of mucus, mucin. Next, in the external context, we present our preliminary experimental work on the impact of rheology and composition as well as ambient air conditions on fluid fragmentation. Throughout, we discuss the important implications of these processes on population-level dynamics of infectious disease.

Keyword-1

biofluid characterization

Keyword-2

mucus rheology

Keyword-3

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