

Neutrophil Biophysics through the Lens of NETosis

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Abstract:

Neutrophils are innate immune cells critical for host defense against pathogens. To accomplish their tasks, neutrophils need to generate, transmit and withstand cell-scale physical forces which allow them to deform, rapidly move, and kill pathogens. We investigate the biophysical mechanisms of neutrophil functions in the specific context of NETosis when activated neutrophils release their genetic material to the extracellular environment where chromatin kills pathogens but can also damage the host and worsen inflammation. In this talk, we will discuss our efforts toward understanding how neutrophils generate and transmit the physical forces required to breach the nuclear and plasma membranes – two critical steps for chromatin release to the extracellular space. Beyond NETosis, our work identified novel regulators of cellular integrity which will inform our design of strategies to re-engineer neutrophil functions to improve human health.

Reading List:

Thiam et al., PNAS 2020