

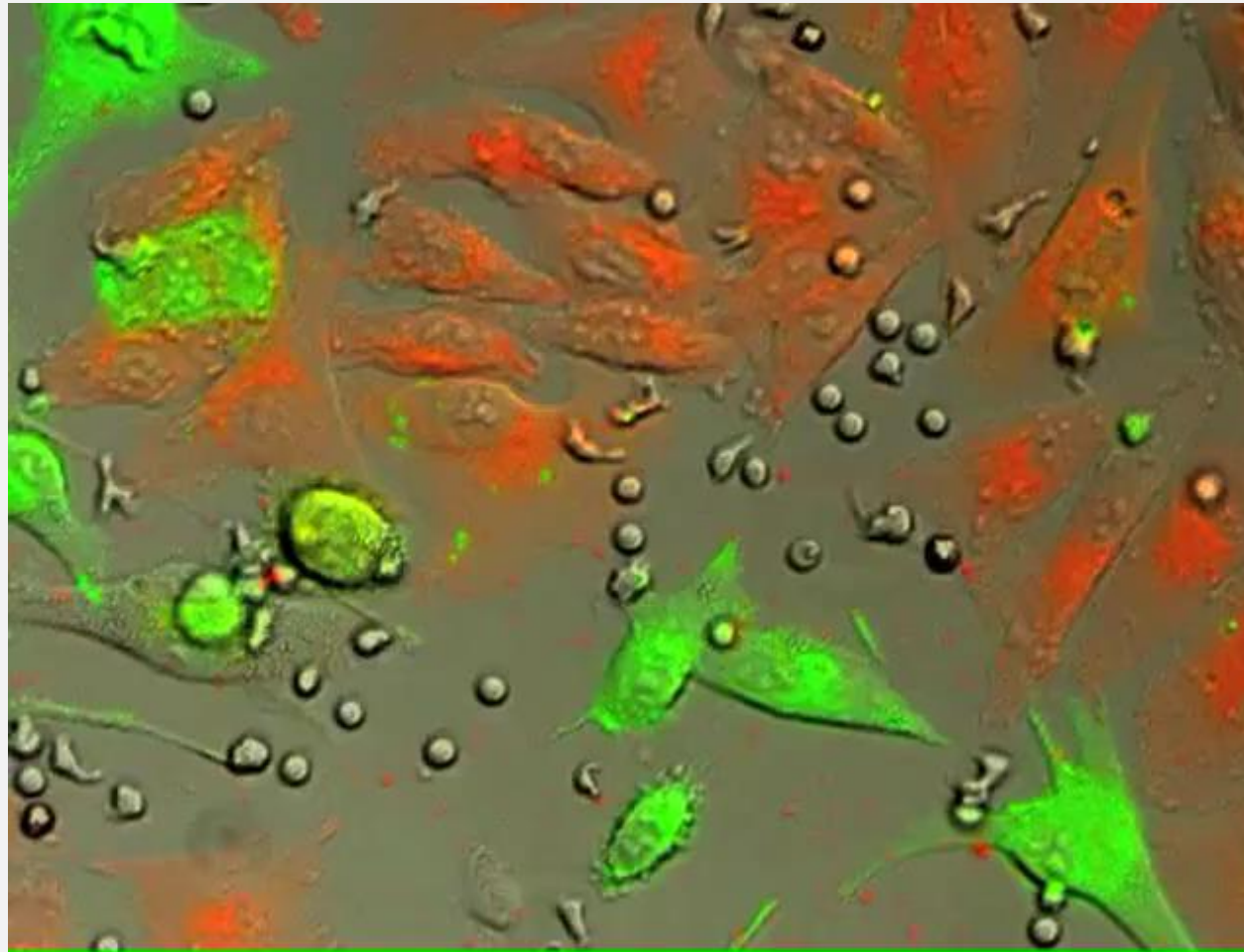
The state diagram of SDF-1 α -stimulated tethering, rolling, and arrest of naïve CD4⁺ T lymphocytes

Nicholas R. Anderson, Dooyoung Lee,
and Daniel A. Hammer

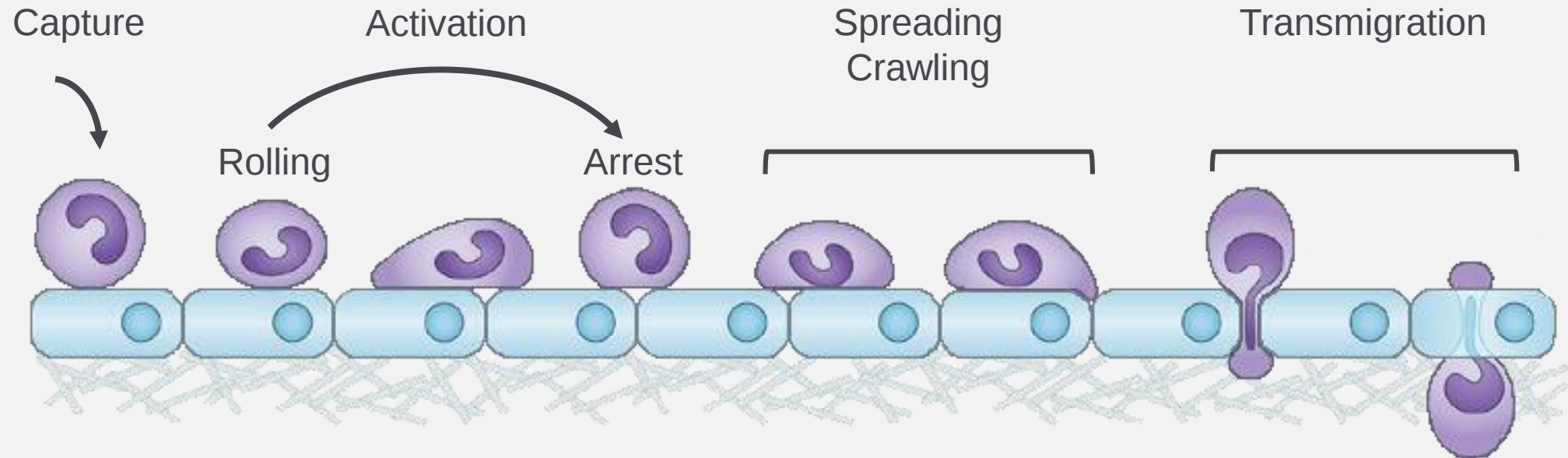
Cell Mech Meeting

9/27/2017

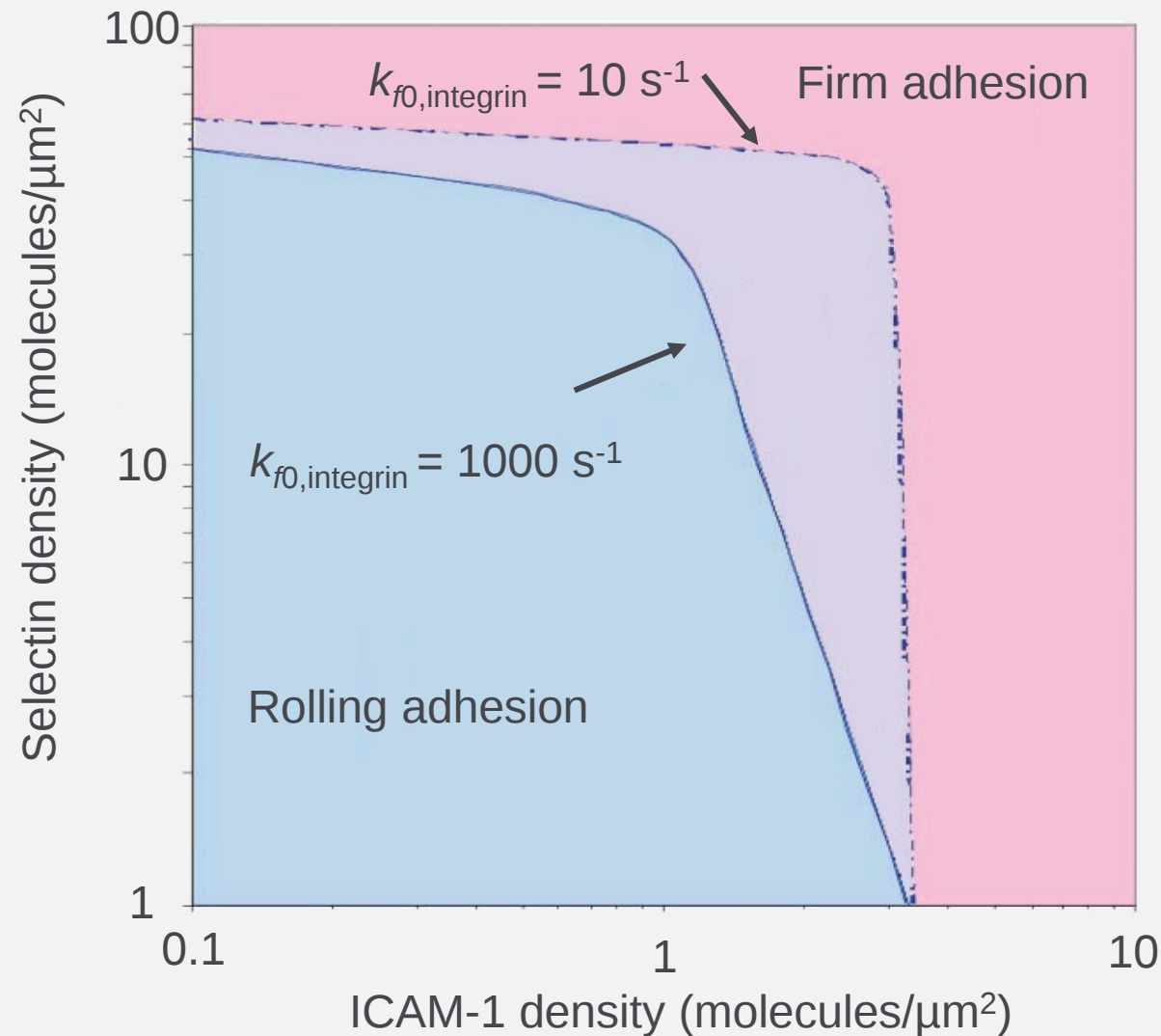
T cells at the forefront of cancer treatments



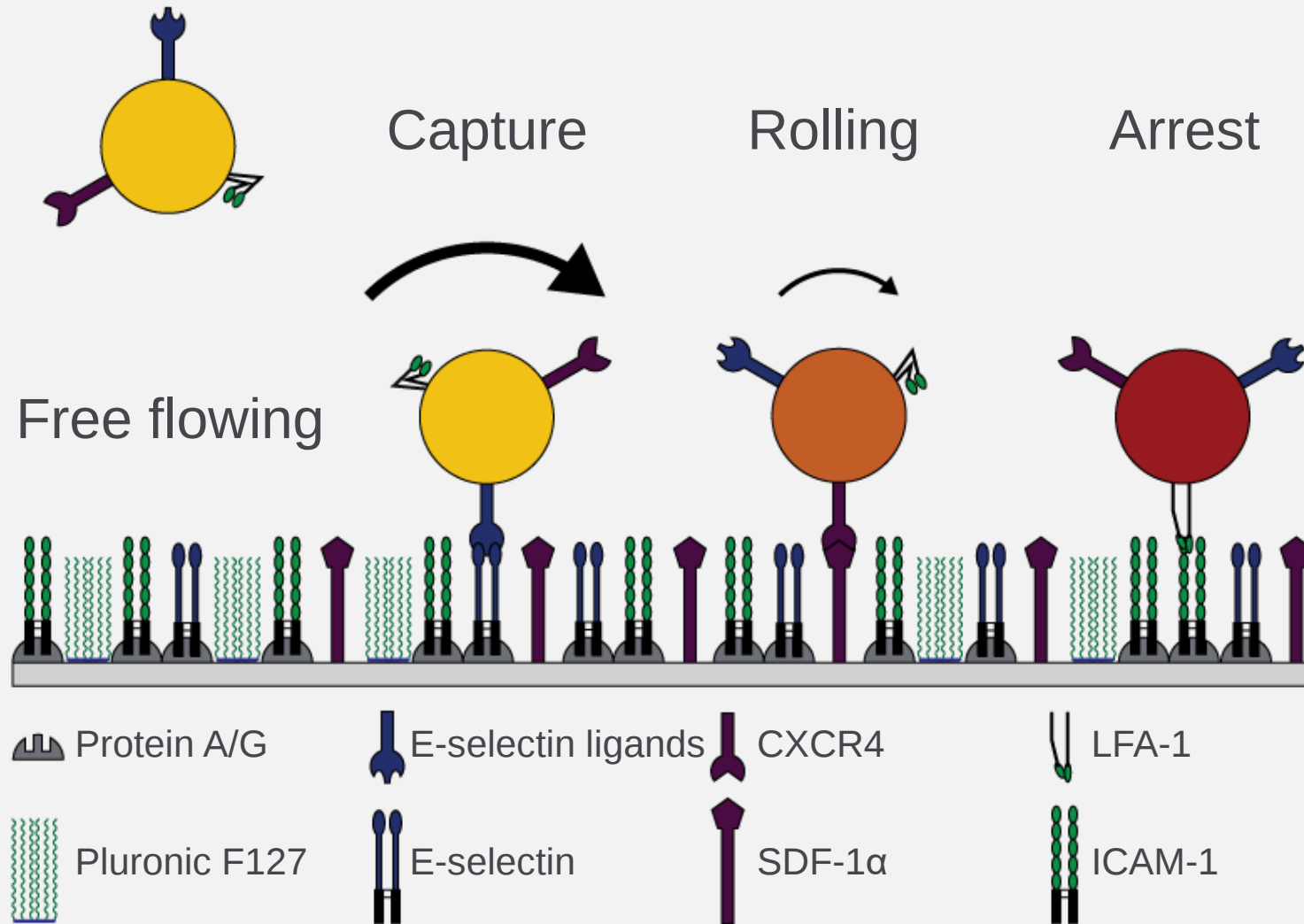
Leukocyte adhesion cascade



Simulated state diagram

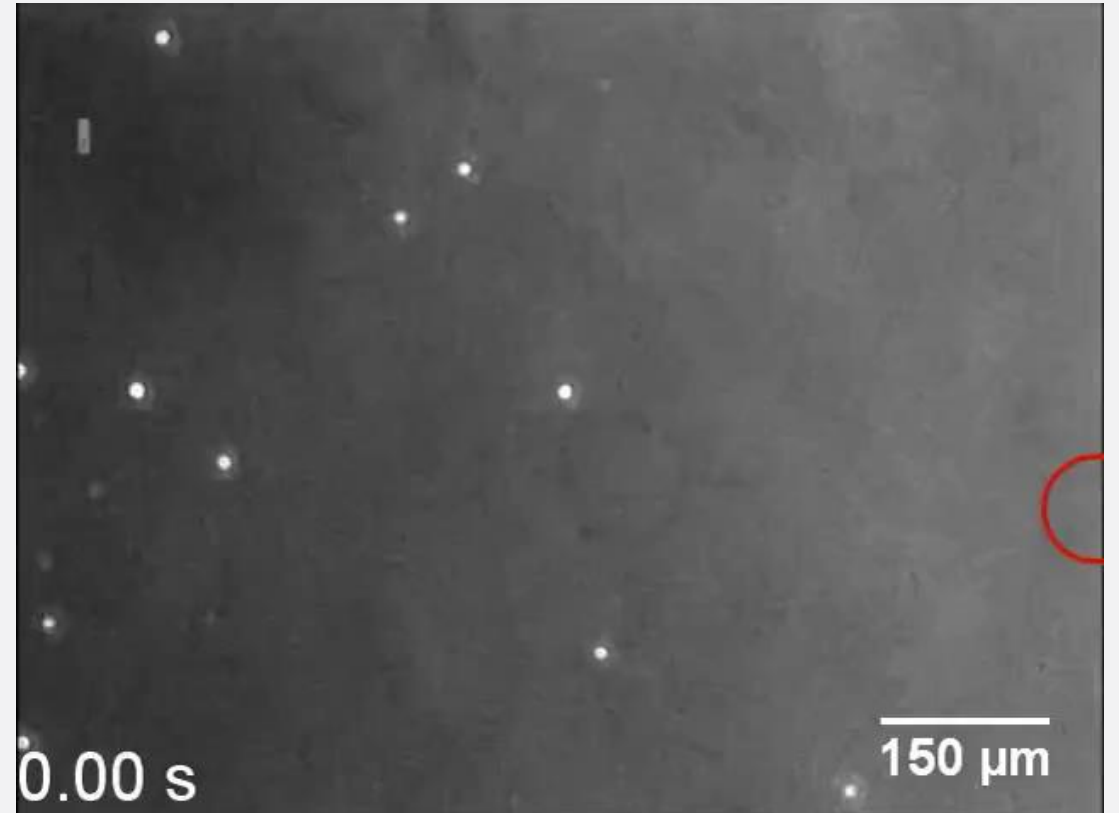


Experimental System



Cellular motion

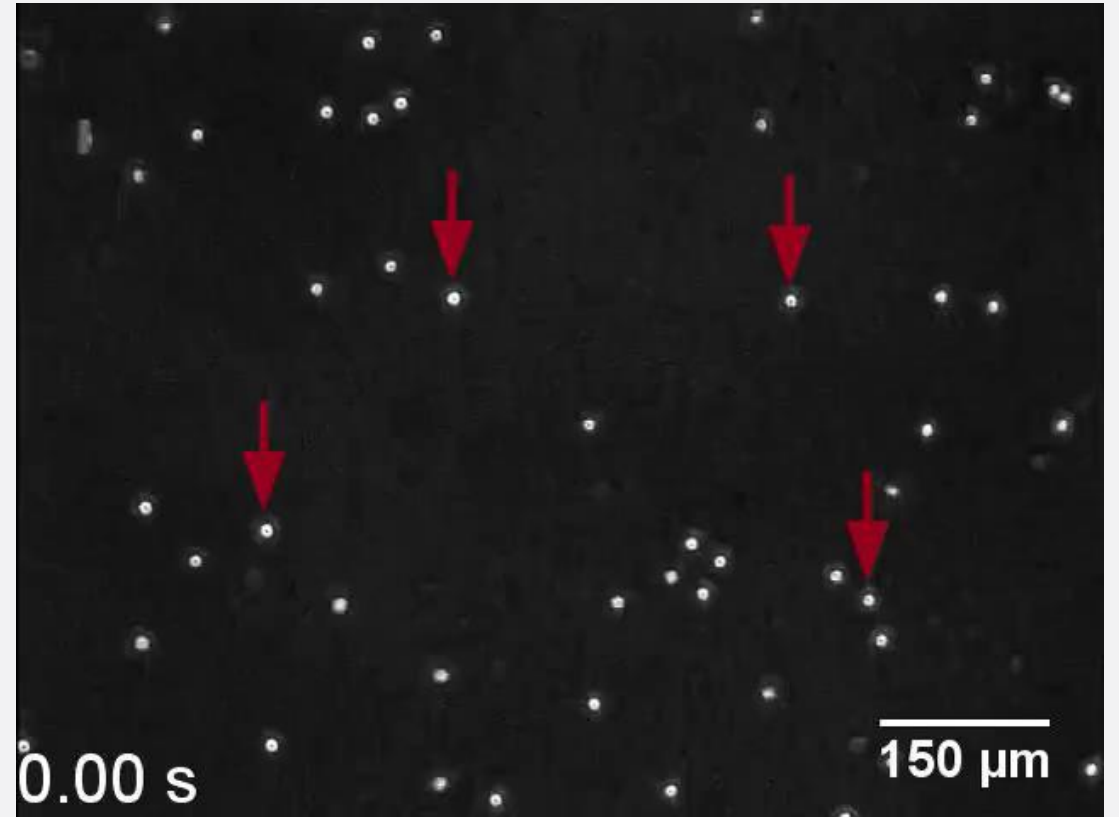
Tethering



Cellular motion

Tethering

Rolling

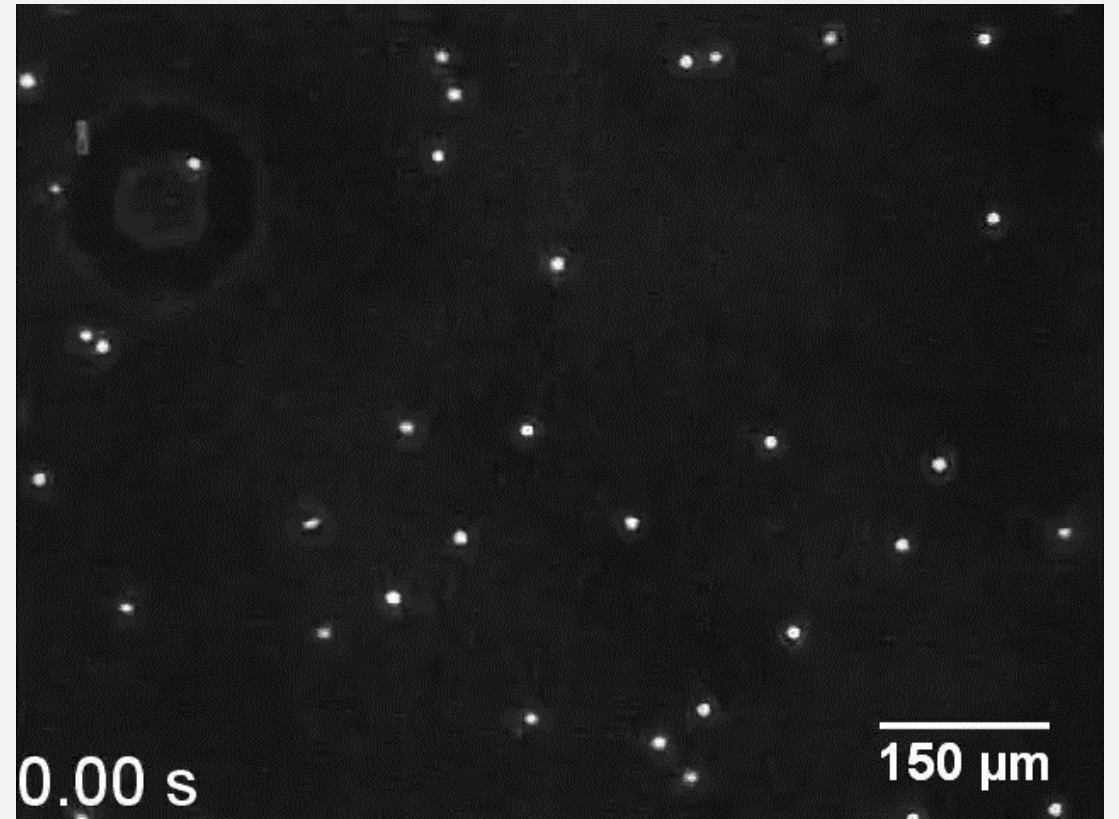


Cellular motion

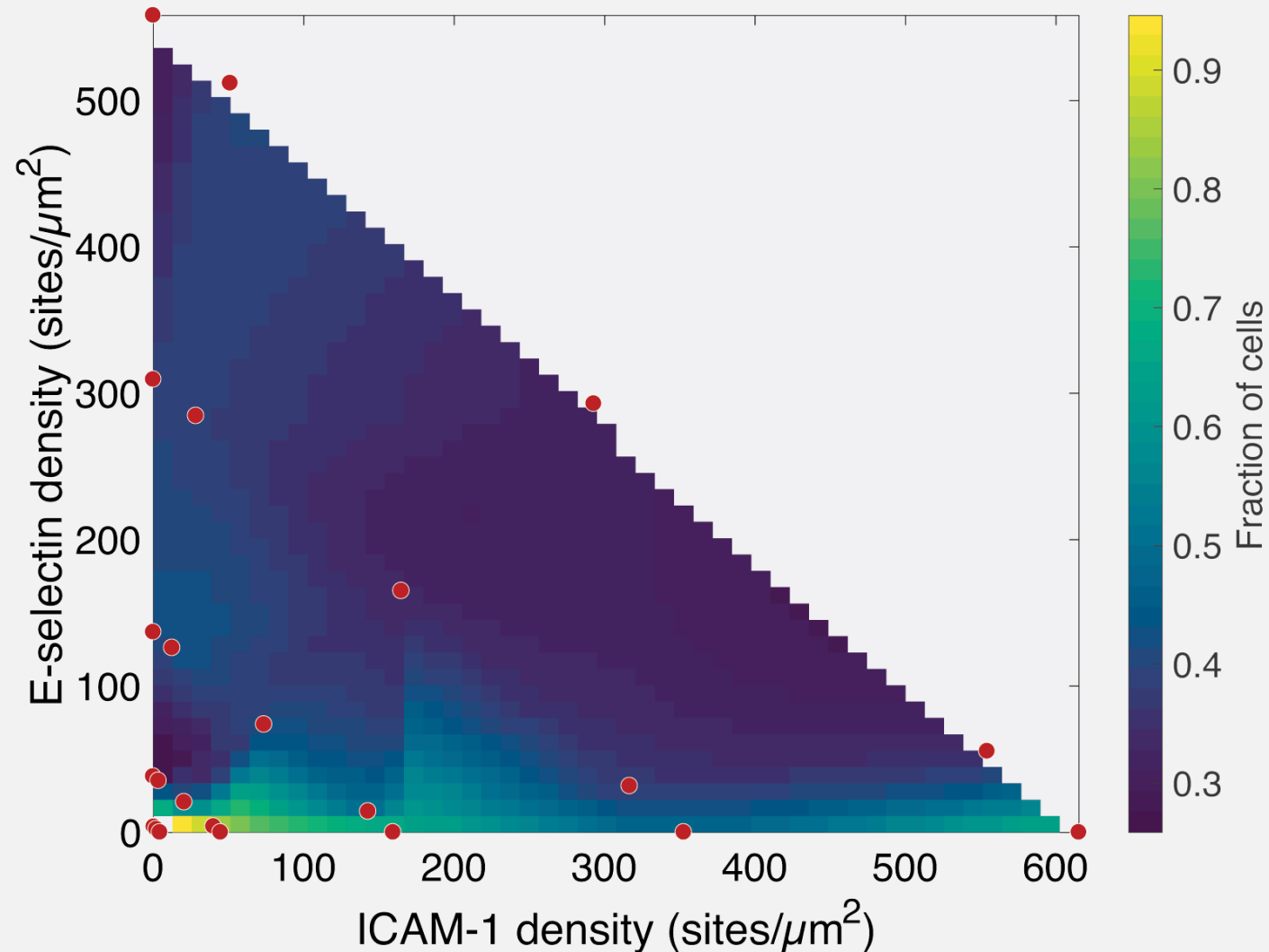
Tethering

Rolling

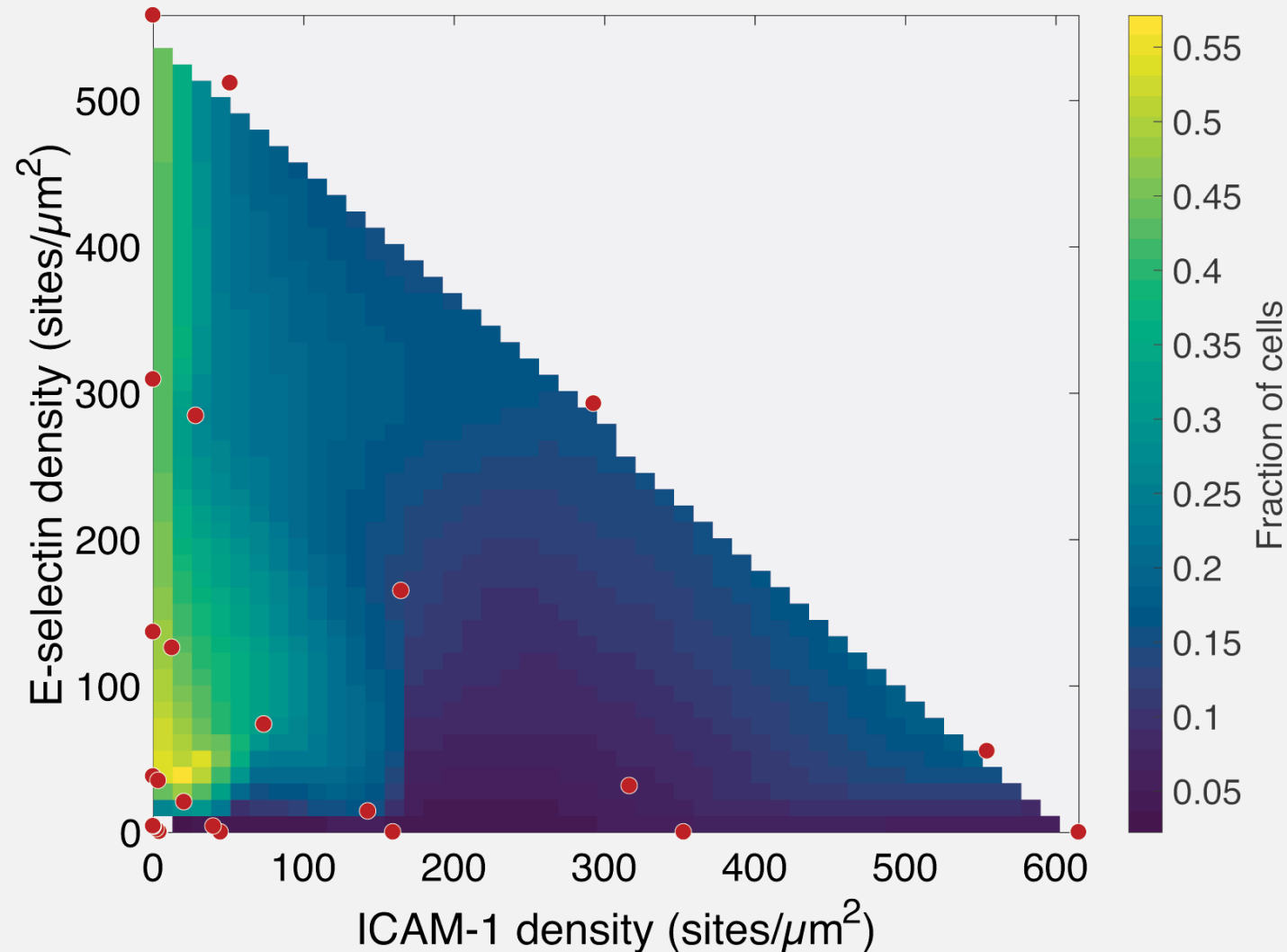
Arrest



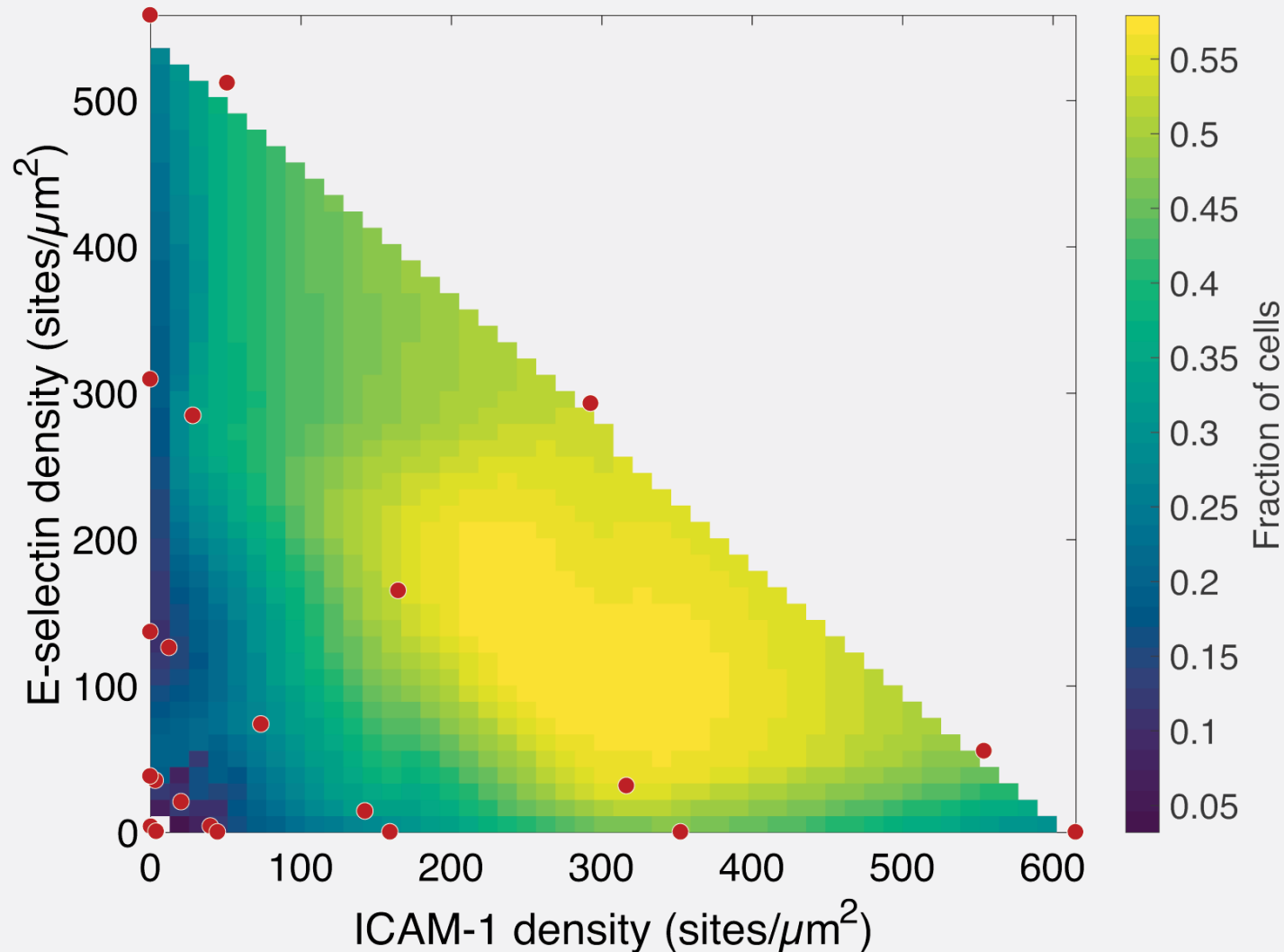
ICAM-1 only surfaces have high levels of tethering



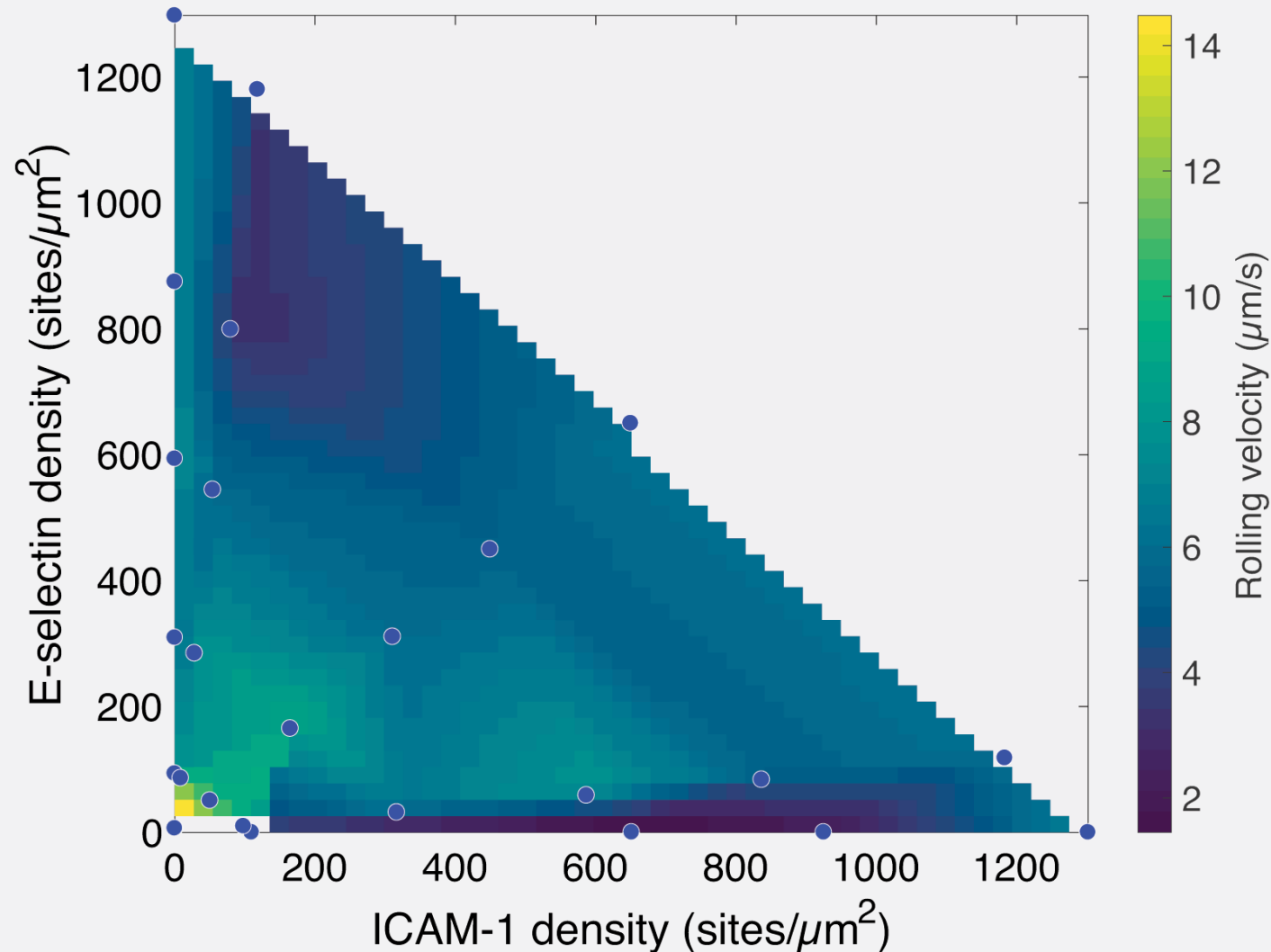
E-selectin enhances rolling



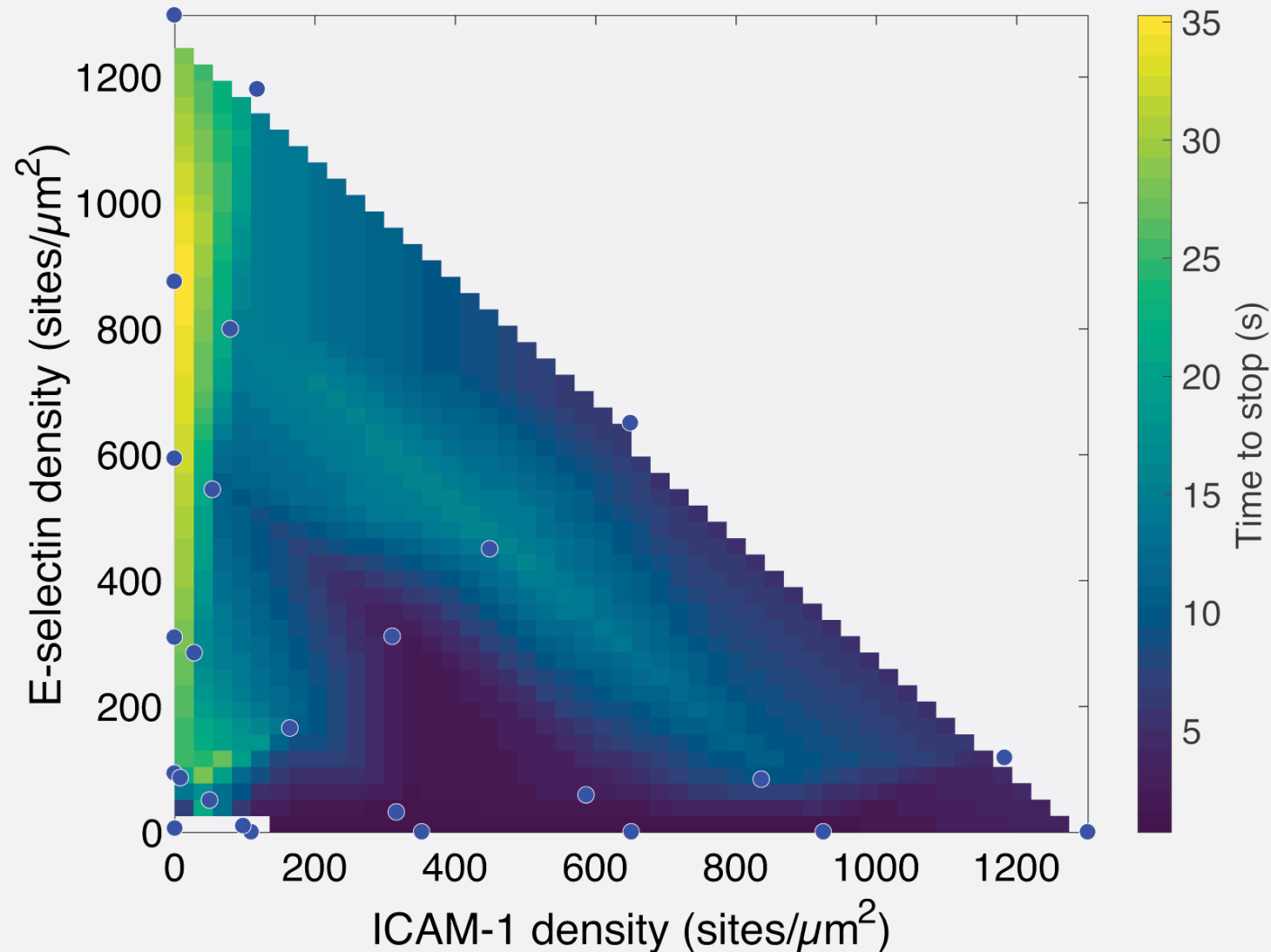
Both E-selectin and ICAM-1 are required for efficient arrest



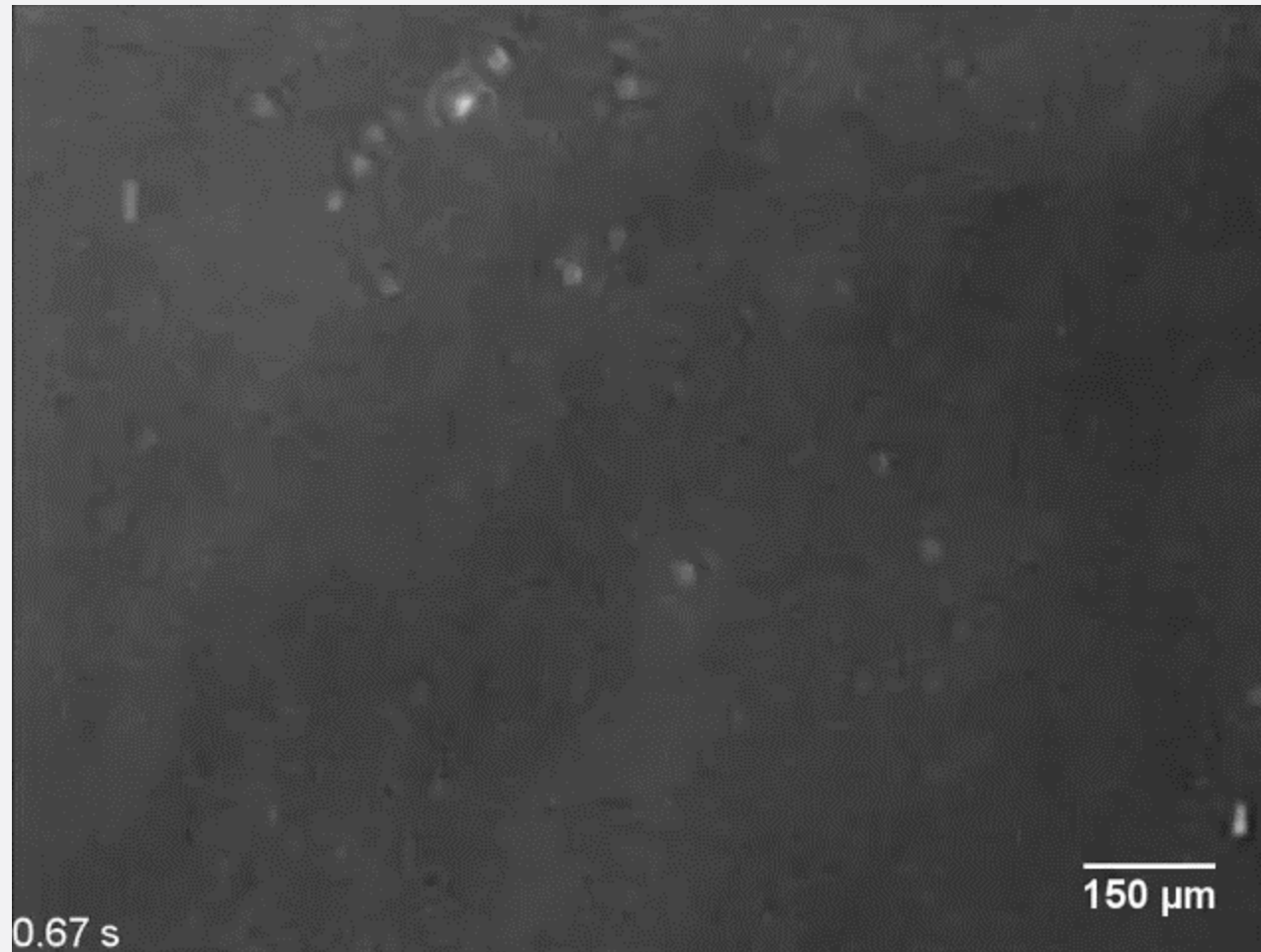
Rolling velocity is constant across many surfaces



ICAM-1 is required for stopping



Connection to upstream migration?



Conclusions

- System allows for study of entire leukocyte adhesion cascade
- E-selectin and ICAM-1 can act synergistically to promote arrest
- Small numbers of E-selectin or ICAM-1 can rapidly change prominent adhesion types
- Naïve CD4⁺ T cells maintain constant rolling velocity across many surface types
- Time to stop can vary significantly depending on surface composition

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