

Research projects

Influenza (with Ian, Gilles, Bard, Frank Toapanta, Ted Ross)

- Modeling systemic immune response to IAV attack
- Model development & data calibration
- Extensive mouse data available
- Systemic response analysis (with Saishuai)

Wound healing (with Qi, Beatrice Riviere, David Hackam, Yoram)

- Cell migration during gut injury
- Elastic layer model (published)
- Extension to 2D
- Development of cell tracking algorithms

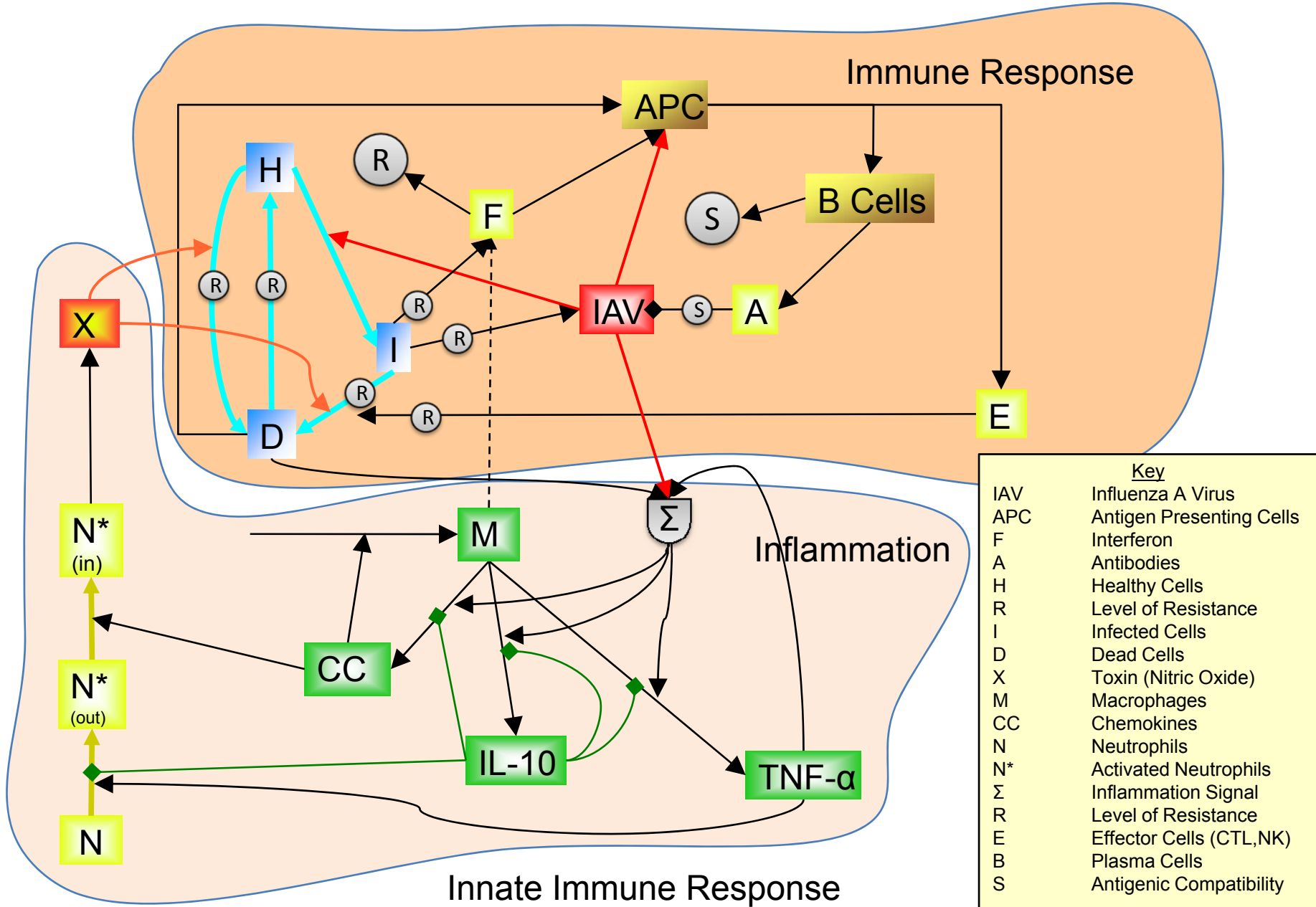
DNA elasticity (with Wilma Olson)

- Elastic model of macromolecular behavior – effect on gene regulation
- Effect of randomly binding bending proteins on elastic properties

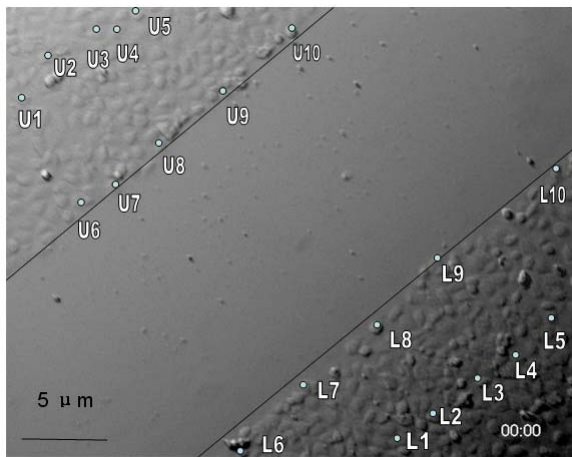
Dynamical properties of biochemical networks

- Bistability, oscillations, influence of stochasticity, graph properties

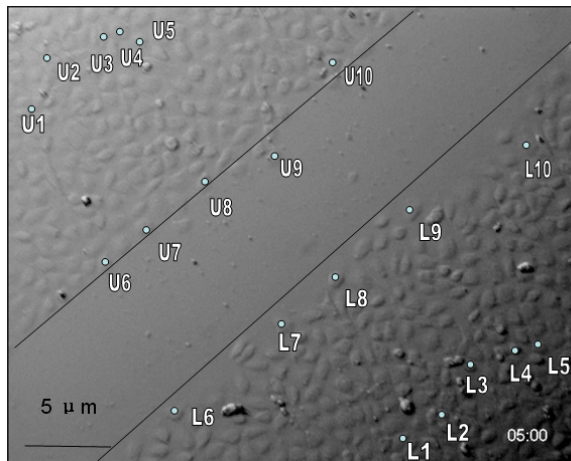
Mammalian Response to the Influenza A Virus



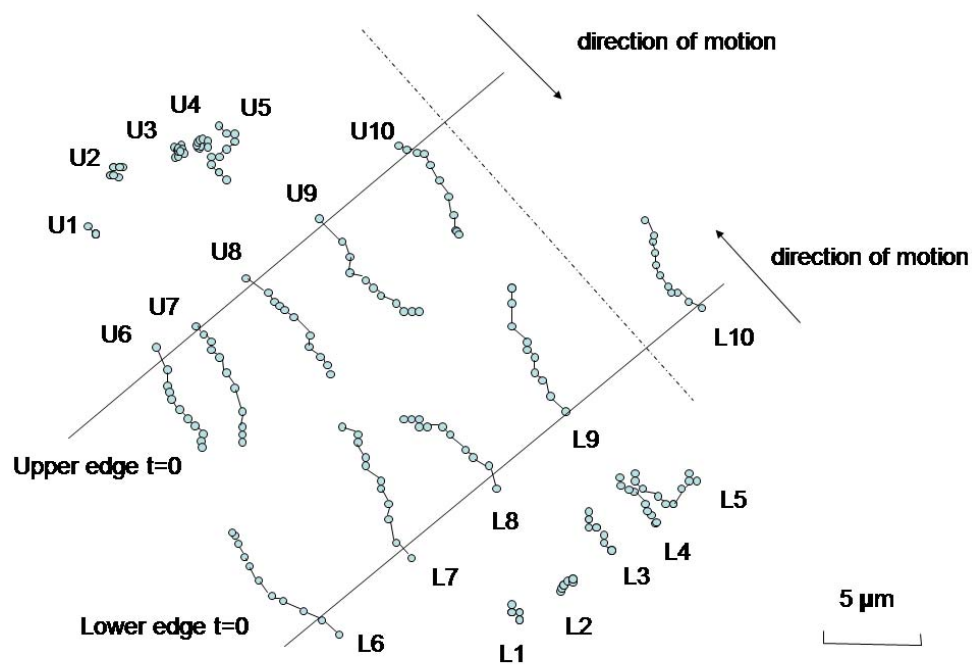
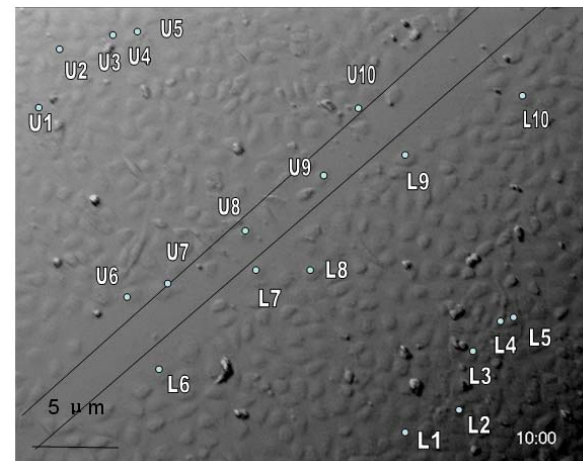
$t = 0$

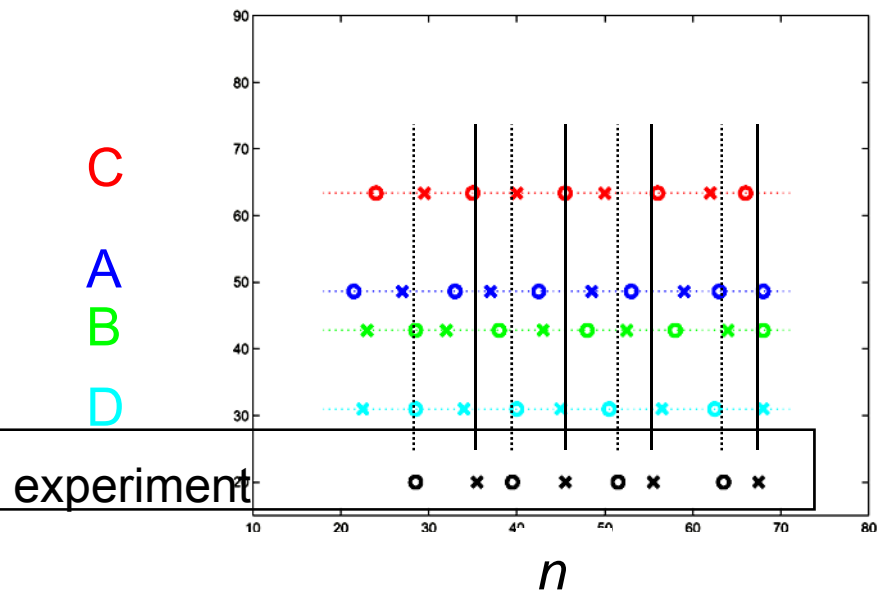
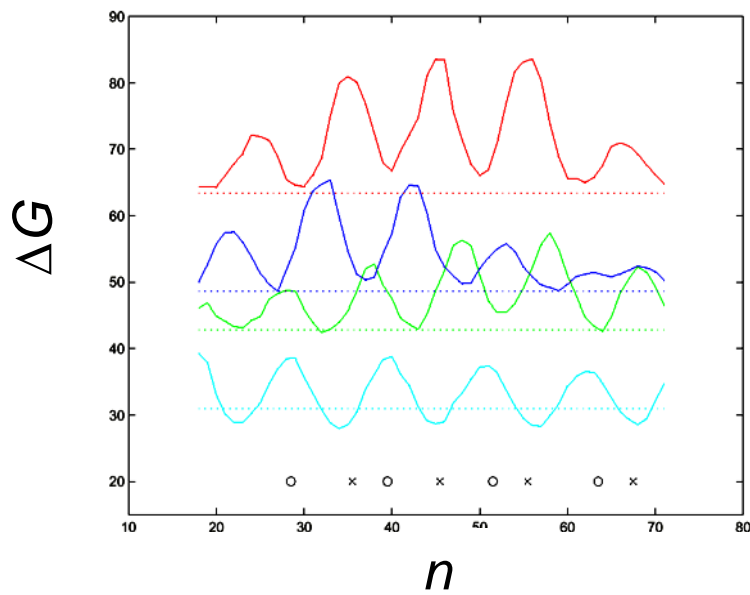
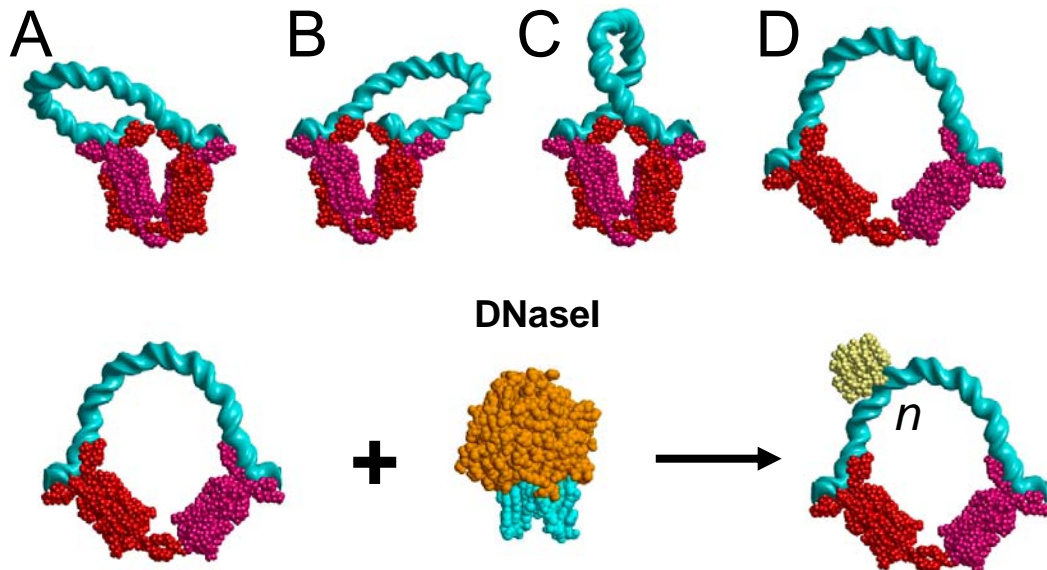


$t = 5\text{h}$



$t = 10\text{h}$





DNA with randomly bound bending proteins (HU)



- 126-bp DNA in the presence of HU
- HU placed randomly at each base pair with probability $w = 0.0115$
(~ 1 HU per 100 bp)