

**Spring
2019**

DiPrima Lecture

Prof. Greg Forest

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University of North Carolina at Chapel Hill

**“An emerging paradigm in biology:
The power of weak binding”**

Abstract: It is cliché to mimic biological design rules in synthetic materials, yet this is the precise challenge for regenerative medicine, therapies for disease pathologies, and vaccines. To design and engineer solutions to biological dysfunction, it is essential to understand Nature’s design rules for successful function. Today, we have data, amazing data, from advances in super-resolution (spatial and temporal) microscopy, targeted fluorescent signaling, chemical synthesis, and various passive and active probes of living systems. I will introduce two biological systems that rely on transient, short-lived, binding interactions to perform diverse functionalities: the genome in live cells with the requirement of genes to self-organize; and, the mucus barriers covering every organ with the requirement to regulate diffusive transport of foreign species within and to flow in order to clear all trapped insults. Time permitting, I will mention other examples. Each system is explored through feedback between experimental data, data analytics, mechanistic modeling and computation, and visualization of experimental and simulated data. Many collaborators will be acknowledged in the lecture.

Date: Monday, April 15, 2019

Time: 4:00pm—5:00pm

Place: Amos Eaton 214

Refreshments: 4th Floor Amos Eaton @ 3:30pm

Reception immediately following lecture,

4th Floor Amos Eaton @ 5:15pm

Host: Peter Kramer