

From single molecules to cellular decision making: connecting the scales using mechanical force

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In this lecture, I will describe our effort to understand how the mechanical responses of single molecules contribute to important cell fate decision, first in the nucleus where DNA resides and then on the cell membrane. We are revealing unusual mechanical properties of DNA that evolution has utilized throughout the history of life on earth. We then repurpose the double helical structure of DNA to probe how the cells sense their mechanical environments.