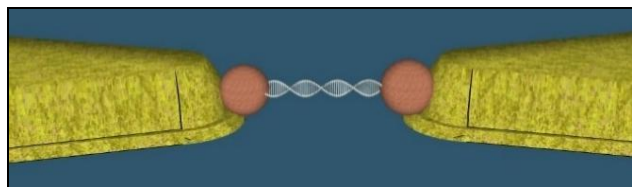


Charge Transport in DNA: From Fundamental Insights to Ultra-Sensitive Detection

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The ability to recognize and manipulate the DNA double helix opens exciting opportunities for molecular electronics. Our recent work (*Nature Nanotechnology*, 2020) demonstrated a breakthrough in measuring charge transport in DNA using a unique configuration. This discovery is not only fundamental for understanding electrical properties in DNA but also holds significant implications for molecular electronics as a whole.

Beyond its intrinsic scientific value, this insight lays the foundation for the development of ultra-sensitive DNA and RNA detection methods. Such advancements are particularly crucial for early cancer diagnosis, pathogen identification, emergency medicine, and pandemic preparedness, as seen in the case of COVID-19.

In this lecture, I will present our approach to probing charge transport in DNA and discuss how we are leveraging this phenomenon for next-generation molecular detection technologies.

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