



## GWC<sup>2</sup> Annual Seminar Speaker

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**“DNA Aptamers for Small Molecules, Metal  
Ions, Proteins, Cells, Tissues and Plastics”**

**Friday, May 2<sup>nd</sup>, 2025 at 3:00 PM**

**Rozanski 102 & Via MicroSoft Teams**

**ABSTRACT:** Aptamers, single-stranded nucleic acids, have emerged as versatile tools for biosensors and drug delivery due to their high specificity and affinity for a diverse range of targets, including small molecules, metal ions, proteins, cells, tissues, and plastics. These molecular recognition elements are generated through combinatorial selections. In this presentation, we investigated key parameters influencing aptamer selection efficiency to optimize aptamer selection for enhanced binding properties. Our findings reveal that lower target concentrations during selection favor the isolation of aptamers with higher affinities, likely by increasing competitive pressure among binding sequences. Additionally, extending incubation times further improves affinity outcomes, allowing for more robust aptamer-target interactions. We also explored the effects of environmental conditions, demonstrating that a lower pH accelerates aptamer enrichment for kanamycin. These insights into the interplay of target concentration, incubation time, pH, and ionic strength provide fundamental guidance for tailoring selection protocols. As a result, we successfully generated a suite of high-affinity DNA aptamers targeting metal ions and small molecules, with potential applications spanning diagnostics, environmental monitoring, and beyond.

