

## DNA and RNA Aptamers as Molecular Sensors

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Although antibodies have long been the biomolecular sensor of choice for analytical methods such as immunoassays and biosensors, aptamers composed of DNA or RNA have emerged as a potent class of molecular recognition elements rivaling antibodies in both affinity and specificity. Aptamers are typically obtained through a process called in vitro selection (SELEX) from  $>10^{14}$  randomly synthesized sequences through cycles of affinity capture and amplification. Affinities of the aptamers depend on the target molecule but typically exhibit dissociation constants between nM to  $\mu$ M range.

To harness the power of molecular recognition by aptamers, however, the aptamer-ligand binding event must be transduced to an analytically detectable signal. Researchers, and surprisingly, nature, have developed ingenious ways to convert aptamer-ligand binding into optical, electrochemical, and genetic signals. In this short talk, I will review several transduction strategies to highlight the versatility of aptamers as molecular sensing elements.