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## **The Convergence of Nanoscience and Nanomedicine: New Approaches for Tracking and Treating Disease**

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### ***Abstract***

Nanotechnology has emerged as one of the most transformative, multi-disciplinary fields. As such, nanotechnology holds promise for solving many of the world's most pressing problems in diverse areas ranging from medicine, information technology, and energy, to the environment. With respect to biology and medicine, nanotechnology has the potential to revolutionize the way diseases are detected, treated, and ultimately cured. Indeed, nanomaterials are the ideal size to efficiently interact with biological structures and thus are potentially useful for both *in vivo* and *in vitro* biomedical research and applications. This presentation will highlight the ongoing discoveries in the Mirkin group on new, nanoscale forms of DNA and RNA that can be used as chemical probes for detecting disease-specific analytes as well as potent gene regulation and immunotherapeutic agents. Taken together, these advances have the potential to change the way many debilitating diseases are studied, tracked, and treated.