

Agilent Thought Leader award for DNA scientist

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Singapore: Dr Hashim M Al-Hashimi of the University of Michigan, US, received an Agilent Thought Leader Award, in recognition of his work in developing advanced nuclear magnetic resonance (NMR) spectroscopy methods to characterize the form of DNA known as Hoogsteen base pairs. Dr Al-Hashimi's research could dramatically alter the way DNA structure is understood.

The award will support Dr Al-Hashimi and his team in their efforts to develop robust and efficient methods for characterizing the unusual structure and biological functions of Hoogsteen base pairs in DNA and DNA-protein complexes. The methods developed through this project will be made widely accessible to the biophysics and structural biology communities via scientific publication and other channels. Dr Al-Hashimi and his team believe that their work could lead to significant advances in DNA-targeted drug discovery and other applications.

Hoogsteen base pairs, which is named after biochemist Dr Karst Hoogsteen, are rare, three-dimensional variations of base-pairing in nucleic acids that are dynamic and structurally distinct from Watson and Crick's linear double-helix model of DNA. NMR spectroscopy is used to analyze the atomic-level hydrogen-bonding patterns of base pairs.

"NMR spectroscopy can provide unique information about the many curious aspects of biomolecular structure and behavior, such as Hoogsteen base pairs, which can in some cases exist in exceptionally low abundance and for very short periods of time," said Dr Al-Hashimi. "I expect that innovations in NMR methods will make it possible to comprehensively examine the occurrence of such unusual base pairs in genomes where they may provide a new and unexplored layer of genetic information."

"The scientific community is in great need of tools to adequately visualize and characterize the dynamics of biomolecules at the atomic level, so we are pleased to support Dr Al-Hashimi's transformative work with NMR spectroscopy," said Dr Regina Schuck, vice president and general manager, Research Products Division, Agilent. "We are confident that his work will yield a variety of NMR-based approaches to DNA research that can be used by NMR experts and novices alike, and quite possibly lead to a radical shift in our understanding of the genetic code."