Mingjie Dai, PhD
Assistant Professor
Bioengineering
Rice University
Deep and Scalable Single-Cell Analysis with Compression Sequencing

Mingjie Dai is an Assistant Professor of Bioengineering, and a technology developer in DNA nanotechnology, super-resolution microscopy, and high-throughput sequencing. Prior to joining Rice, he was a Systems Biology Department Fellow at Harvard Medical School and a Technology Development Fellow at the Wyss Institute for Biologically Inspired Engineering at Harvard. He has developed DNA-PAINT based super-resolution fluorescence microscopy methods capable of observing and tagging single molecules with high sensitivity and spatial resolution, next-generation sequencing based methods for scalable and high-sensitivity viral diagnostics, and functional DNA nanostructures for high-throughput single molecule biophysical studies. The molecular tools and microscopy methods developed in his work have broad applications in basic biomedical research and clinical use, from understanding the underlying cause and progression of disease, to sensitive and scalable viral diagnostics.

Dai earned his B.A. and M.Sci. in Physics from the University of Cambridge, U.K. in 2010, and his Ph.D. in Biophysics from Harvard University in 2016. He has published more than 15 peer-reviewed publications in journals including Nature, Science, Nature Methods, Nature Chemistry, and Nature Nanotechnology. His technology development efforts also resulted in more than 5 patents or provisional applications.

His research is supported by a CPRIT First-Time, Tenure-Track Faculty grant (2022), and an NIH Pathway to Independence (K99/R00) award (2021). He was a Systems Biology Department Fellow at Harvard Medical School (2017), an HHMI International Student Research Fellow (2012), and a Gold Medalist and Einstein Centennial Prize winner at the International Physics Olympiad (2005).