

From Superresolution to Fluorescence Enhancement with DNA Origami

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In recent years, DNA nanotechnology has matured to enable robust production of complex nanostructures and hybrid materials. We have combined DNA nanotechnology with sensitive optical detection to create functional single-molecule devices such as nanoscopic rulers for superresolution microscopy and energy transfer switches^{1, 2}. DNA origamis are also used for single-molecule placement in zeromode waveguides using nanoadapters³ and for fluorescence enhancement with gold nanoparticles⁴. I will discuss DNA origami applications to improve single-molecule detection and how DNA origami in combination with the recently developed superresolution technique DNA PAINT⁵ can be used to study the interactions of emitters with metallic nanostructures in a single-molecule mirage. To this end, a method to disentangle the complex factors that influence the fluorescence of single molecules near metallic nanostructures will be presented⁶.

References

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