Counting molecules, dodging blood cells: continuous, real-time molecular measurements directly in the living body

Prof Kevin Plaxco
University of California, Santa Barbara

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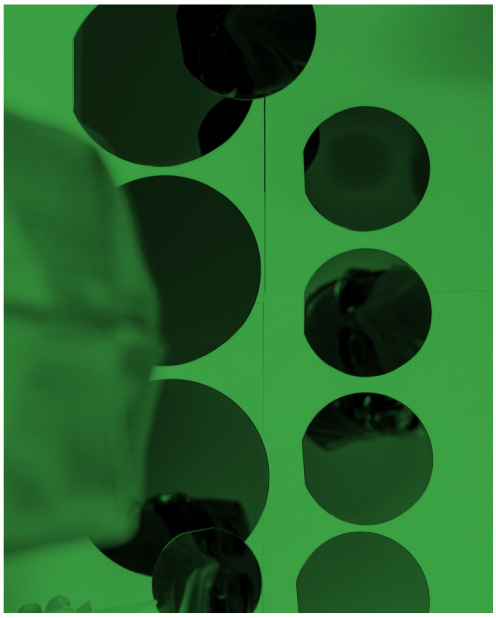
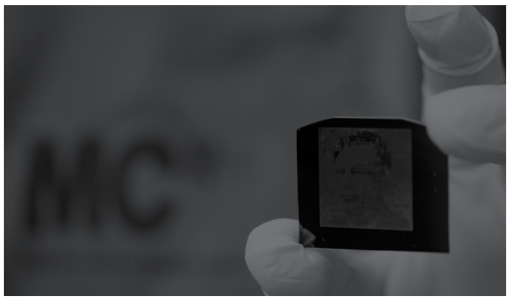
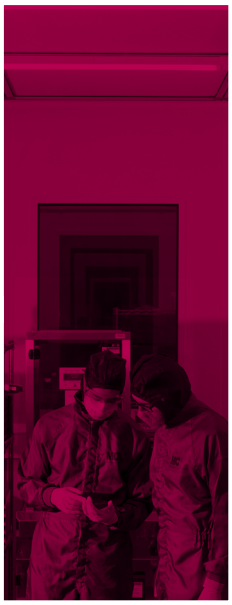
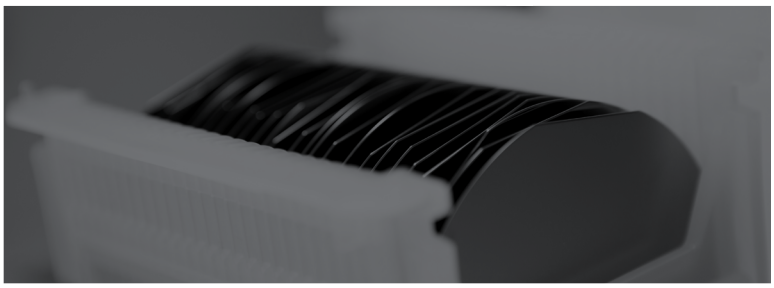
The Melbourne Centre for Nanofabrication
151 Wellington Road, Clayton, 3168









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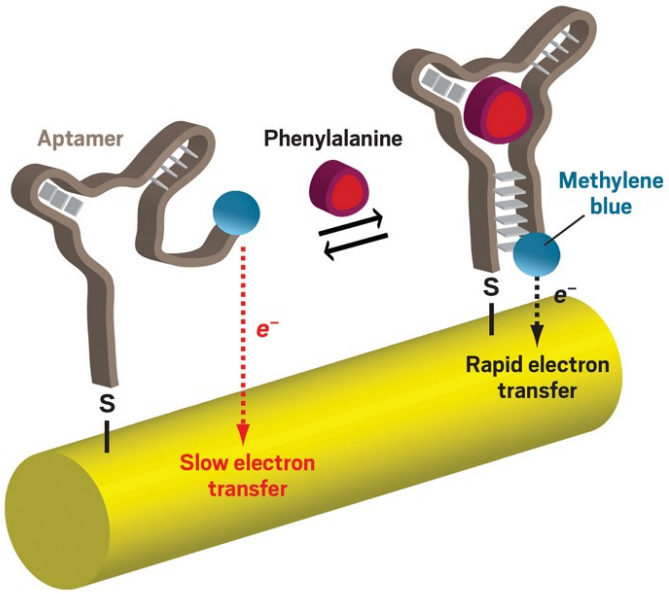

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Abstract:

The availability of technologies capable of tracking the levels of drugs, metabolites, and biomarkers in real time in the living body would revolutionize our understanding of health and our ability to detect and treat disease. Imagine, for example, a dosing regime that, rather than relying on your watch ("take two pills twice a day"), is instead guided by second-to-second measurements of plasma drug levels wirelessly communicated to your smartphone. Such a technology would likewise provide researchers and clinicians an unprecedented window into neurology and physiology, and could even support ultra-high-precision personalized medicine in which drug dosing is optimized minute-by-minute using closed-loop feedback control. Towards this goal, we have developed a biomimetic, electrochemical sensing platform that supports the high frequency, real-time measurement of specific molecules (irrespective of their chemical reactivity) in situ in the blood and tissues of awake, freely moving subjects.

Short Bio:

Kevin Plaxco is a Professor, Department of Chemistry and Biochemistry and Associate Director, Center for Bioengineering at the University of California, Santa Barbara. Prior to joining the University of California at Santa Barbara in 1998 Dr. Plaxco received his Ph. D. from Caltech and performed postdoctoral studies at Oxford and the University of Washington. Dr. Plaxco has co-authored more than 180 papers on protein folding, protein dynamics, folding-based biosensors and folding-based smart materials. He has also co-authored a popular science book on Astrobiology and more than a dozen patents. He is actively involved in the commercialization of the novel technologies emerging from his laboratory and serves on the scientific advisory boards of a half dozen companies.