

## **Force Recognition Localization of Specific Protein and Glycoprotein Moieties**

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I will describe recent experiments using force spectroscopy to map the specific locations of target structures and molecules in biological structures. Firstly, primary cilia are solitary, immotile, hair-like structures that protrude from the apical membrane of kidney epithelial cells into the cavity of the nephron, and are decorated with a rich variety of protein molecules. The distribution and the role of channel proteins such as Polycystin-1 (PC-1) and Polycystin-2 (PC-2) are the subject of ongoing debate, and we have adopted a multi-factorial microscopy approach to investigate the biophysical properties of the primary cilium.

Using imaging force spectroscopy we have correlated specific recognition events with ciliary topography, and observed the punctate distribution of PC-1 and PC-2, to nanometre resolution, and correlated these force recognition maps with nanomechanical analysis. Secondly, we have probed the sub-molecular structure of branched glycoconjugates, MUC5AC and MUC16, with probes specific for both sugars and peptide moieties. I will also describe efforts to extend force recognition microscopy with specially designed and modified cantilevers.