

## Investigation protein-based structures by SPM

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Lectins are carbohydrate binding proteins capable of recognizing and binding glycan/sugar moieties present on a range of biomolecules including cells, viruses and proteins. Lectin functionalized biosensor (LFB) platforms present exciting opportunities as enhanced diagnostic tools enabling simple, rapid real time and label free detection, analysis and quantification of biological analytes with high sensitivity in small sample volumes. Use of high throughput LFB platforms could facilitate applications in biopharmaceutical product development or act as Process Analytical Technology (PAT) tools to enhance the fidelity and efficiency of production processes.

Diphenylalanine Phe-Phe is a model compound for investigating the self-assembly of organic molecules and formation of micro- and nanotubes and thin films [1]. Moreover, Phe-Phe microtubes have attracted significant research interest due to the excellent piezoelectric properties that these material exhibit [2] leading to their proposal for biocompatible piezoelectric elements for medical devices [3].

This work aims to produce biosensors by ink-jet printing of specific LFBs and Phe-Phe in a highly structured arrays to facilitate their use as a point of care diagnostic devices and screening arrays for biopharmaceutical production. Early results will present on the dielectric and piezoelectric properties of protein-based structures and surface morphology, protein orientation obtained post printing. Also, the sensitivity to the carbohydrate was tested.

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