# HYBRID AFM AND FLUORESCENCE NANOSCOPY TO IMAGE AMYLOIDS: FROM MATERIALS TO BIOMEDICINE

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Advances in high resolution imaging techniques have led to an increasingly detailed insight into structures and mechanisms in cells and materials. Hybrid approaches that exploit the synergies between two of these techniques can provide an even more comprehensive understanding of many systems. In this talk, I will discuss the benefits and challenges of combining super-resolution fluorescence microscopy with atomic force microscopy (AFM) *in situ*. The correlation between these techniques provides a high resolution topography image as well as specific chemical information, the latter with a spatial resolution approaching that of AFM. This tool can be used to validate novel super-resolution imaging methods [1], as well as to obtain complementary information about the structure and properties of (bio)materials [2]. The latter will be exemplified on a hybrid nanomaterial that consists of protein (amyloid) fibrils functionalized with organic fluorophores and quantum dots. The fibrils are made of denatured β-lactoglobulin, an important protein model for amyloid-like aggregation, with very interesting structural features that can be resolved with AFM [3]. Moreover, I will show that correlative AFM and fluorescence microscopy is a unique tool to characterize the mechanism of action of amyloid-targeting drugs [4].

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