

Adhesion of cellulose binding modules – a single molecule study

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In Nature, certain organisms, such as fungi, have developed special enzymes namely cellulases, containing protein domains that are able to attach the actual enzyme to cellulose selectively [1]. Similar protein domains also exist at the interfaces of biological composites such as nacre and can play very important role in bringing about adhesion between the components of hybrid materials. Here, we will quantify the binding ability of cellulose binding modules (CBMs) from the enzymes Cel7A from the fungus *T. Reesei*, by measuring the strength of adhesion on cellulosic surfaces. **In fact**, being highly abundant and renewable, cellulose is an interesting option for nanocomposites [2].

In details single molecule force spectroscopy technique (SMFS) is employed into the understanding of the binding affinity at molecular level. The protein of interest is attached covalently to the tip by a multistep covalent functionalization process.

[1] M. Linder and T. T. Teeri, *Proceedings of the National Academy of Sciences*, 93, 12251-12255 (1996).

[2] D. Klemm, F. Kramer, S. Moritz, T.Lindström, M. Ankerfors, D. Gray, A. Dorris, *Angew. Chem., Int. Ed.*, 50, 5438–5466 (2011).