MOLECULAR INTERACTION BETWEEN BACTERIAL ANTIGEN AND MACROPHAGE RECEPTORS STUDIED BY ATOMIC FORCE MICROSCOPY

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Atomic force microscopy (AFM) is a powerful high resolution imaging method for investigation of biological samples, which opens the possibility to study dynamical biological processes *in viv*o [1]. In addition to its microscopic capabilities, AFM allows for a direct probing of forces between biological molecules (e.g. antigen-antibody) [2,3] or between molecules and receptors on the surface of cell (e.g. ligand-receptor) [4,5].

In this work AFM was used to study interactions between bacterial antigen and receptors of macrophages surface. We used two bacterial cell wall components: lipopolysaccharide (LPS) derived from gram-negative *Escherichia coli* and exopolysaccharide (EPS) derived from gram-positive *Lactobacillus rhamnosus*. Interactions between these bacterial antigens and immune cell receptors were studied in peritoneal macrophages derived from two strains of mice, CBA and C3H/J, in which the Toll-like receptor 4 (TLR4) is genetically disabled. The strength of bond (interaction) between these antigens and receptors is crucial for the response of the immunological protection system.

Standard immunological methods provide information about ligand-receptor interactions by monitoring the products of these reactions on macroscopic scale. By using atomic force spectroscopy we could determine directly the strength of the interaction in the studied systems at the level of single molecules.

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