



Atomic Force Microscopy: A Promising Tool for Deciphering the Pathogenic Mechanisms of Fungi in Cystic Fibrosis

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Titre Atomic Force Microscopy: A Promising Tool for Deciphering the Pathogenic Mechanisms of Fungi in Cystic Fibrosis

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Résumé en anglais During the past decades, atomic force microscopy (AFM) has emerged as a powerful tool in microbiology. Although most of the works concerned bacteria, AFM also permitted major breakthroughs in the understanding of physiology and pathogenic mechanisms of some fungal species associated with cystic fibrosis. Complementary to electron microscopies, AFM offers unprecedented insights to visualize the cell wall architecture and components through three-dimensional imaging with nanometer resolution and to follow their dynamic changes during cell growth and division or following the exposure to drugs and chemicals. Besides imaging, force spectroscopy with piconewton sensitivity provides a direct means to decipher the forces governing cell-cell and cell-substrate interactions, but also to quantify specific and non-specific interactions between cell surface components at the single-molecule level. This nanotool explores new ways for a better understanding of the structures and functions of the cell surface components and therefore may be useful to elucidate the role of these components in the host-pathogen interactions as well as in the complex interplay between bacteria and fungi in the lung microbiome.

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