Scanning Electron Microscopy for Understanding the Role of Morphology for Pathogenicity

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A good understanding of the pathogen behaviour is a priori for designing new drug paradigms that can surpass the function of current available medicine. Here, we present two cases, which highlights the capabilities of the scanning electron microscope (SEM) for advanced characterization of pathogens in favourable and hostile environments.

First, we present a good practice protocol that allows for imaging fimbria on an Enteroaggregative *E.coli*[1]. The SEM has a large depth of focus and a fairly large field of view. This, along with the fact that the electron micrograph is a true representation of the surface makes the SEM a complementary technique, which can be used to confirm and strengthen the multiplex PCR studies of aggregative adherence fimbriae.

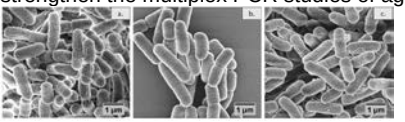

Figure 1. Micrographs of wild type *E.coli* showing fimbriae (a), a fimbrial mutant (b), and the complemented mutant with its native fimbriae (c).

Second, we present time laps SEM morphology studies of *E.coli* exposed to two different antimicrobial peptoids. These micrographs corroborate that the antimicrobial peptoids studied target the *E.coli* membrane and inhibits metabolic processes by targeting intracellular structures. This second study shows that SEM can be used as a standalone technique for elucidation of the specific mechanism of action of antimicrobial compounds.

Figure 2. *E.coli* morphology before (a) and after challenging with peptoid 1 (b) and peptoid 2 (c).

References

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