



**De Oosterpoort, Groningen  
Friday, 7 April 2016**

**Plenary Lecture**

Viola Vogel (Laboratory of Applied Mechanobiology, ETH Zürich) – Fighting bacterial infections: The nanomechanics of a macrophage attack

**Abstract:**

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How do our immune cells fight bacterial infections, particularly in cases where bacteria hold on tightly to surfaces or tissue fibers? What kind of hunting tactics do they apply? The fight of immune cells with bacteria has many mechanical aspects that have found little attention until recently. To clear pathogens from host tissues or biomaterial surfaces, macrophages have to first identify their prey, and subsequently form sufficiently stable bonds or clusters of bonds to firmly hold on to the prey while they prepare themselves to get into a position where the prey can be phagocytosed. Micromanipulation and many other technologies will be presented by which we studied the hunting tactics of macrophages, and finally whether all *E. coli* bacteria are killed once internalized. Even though many strategies have been applied by mankind to fight bacterial infections, primarily designed to either kill bacteria via antibiotics or more recently to prevent their adhesion to surfaces and host tissues, little attention has been given to asking how pharmaceutical strategies might compromise the efficiency of our own immune cells to clear bacterial infections.