

# **Deciphering attachment of rotavirus to cell surface by AFM-combined confocal microscopy**

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## **Abstract**

Rotavirus causes severe gastroenteritis and death in infants and children around the world. Although vaccination for rotavirus was introduced 10 years ago, rotavirus infection leads to > 200,000 deaths per year. Especially, the mortality is very high in low-income countries. The viral infection starts with the binding of the virus to the receptors on the cell surface. Albeit some molecules involved in the infection are known, the precise molecular mechanisms how rotavirus attaches on the cell surface and is internalized in cells are poorly understood due to the limitations in technique. We previously reported that the binding of a virus can be probed by atomic force microscopy (AFM)-combined confocal microscopy, which allows imaging the cellular receptors and tracing the virus binding events on a cell at high resolution (<50nm) [1]. Here we elucidate that single rotavirus directly binds to the sialic acid (SA) and their receptors, integrin  $\alpha 2\beta 1$ , on model surfaces and the surfaces of living cells by using AFM-combined confocal microscopy.

## **References**

- [ 1 ] D. Alsteens, et al., Nanomechanical mapping of first binding steps of a virus to animal cells. Nat. Nanotechnol. (2017), 12, 177–183.