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## A new tool for detecting and destroying norovirus

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Noroviruses are positive-sense, single-stranded RNA viruses and are a major cause of gastroenteritis worldwide. Norovirus capsid protein can be subdivided into a shell (S) domain, hinge (H) region, and protruding (P) domain. The P domain contains the most genetically variable region on the capsid and binding site for histo-blood group antigens (HBGAs). Despite their discovery over 40 years ago, there are still no vaccines or antivirals. In this project we characterized binding of several VHHs (nanobodies) to human norovirus capsid. One nanobody, Nano-85, was broadly reactive, while the others, Nano-25 and Nano-27, were strain specific. All nanobodies bound to the lower region on the P domain and had nanomolar affinities. The Nano-85 binding site mainly comprised highly conserved amino acids among the genetically distinct genogroup II noroviruses. Several of the conserved residues also were recognized by a broadly reactive monoclonal antibody, which suggested this region contained a dominant epitope. Superposition of the P domain nanobody complex structures into a cryoelectron microscopy particle structure revealed that both nanobodies bound at occluded sites on the particles. The flexible hinge region likely permitted a certain degree of P domain movement on the particles in order to accommodate the nanobodies. Interestingly, the Nano-85 binding interaction with intact particles caused the particle disassembly *in vitro*. Altogether, these results suggested that the highly conserved Nano-85 binding epitope contained a trigger mechanism for particle disassembly.

### Biography

Anna D Koromyslova graduated with honors from Lomonosov Moscow State University, Russia in 2012. After graduation she worked as a Research Engineer at Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry of RAS, Moscow, Russia. Since 2013 she is a Postdoctoral student in Heidelberg University and German Cancer Research Center, Germany. She is the author of five scientific papers, one of which was recently spotlighted in *Journal of Virology, ASM*.

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