

## **Leader Llama antibody group**

Dr. Michiel M. Harmsen joined the Central Veterinary Institute of Wageningen UR in 1995 with research on use of single-domain antibodies for treatment and diagnosis of veterinary infectious diseases. Initially his research focussed on prevention of piglet post-weaning diarrhoea by oral application of VHHs that bind to the causative enterotoxigenic *Escherichia coli* strains. He demonstrated that VHHs with high proteolytic stability can be isolated and further improved by DNA shuffling ([Harmsen et al., 2006](#)). In 2001 his research interest shifted to foot-and-mouth disease (FMD), initially with the aim to confer rapid protection against this viral disease. Since 2007 he also uses VHHs as research tools for quality control and R&D on FMD vaccine antigens. Since 2010 he initiated research on influenza, resulting in a large set of VHHs binding all nine neuraminidase types ([Harmsen et al., 2013](#)). He is author on 20 scientific publications on VHHs, including [a review](#), and three patent applications.