## VRIJE UNIVERSITEIT BRUSSEL - BRUSSEL, BELGUM (Serge Muyldermanns svmuylde@vub.ac.be)

The 'Cellular and Molecular Immunology' laboratory at the Vrije Universiteit Brussel (CMIM-VUB, Brussels, Belgium) offers a SAE program placement research project for a biology/microbiology/biotechnology student.

The 'Molecular immunology' group within CMIM-VUB, now headed by Prof S. Muyldermans discovered the occurrence of unique heavy chain only antibodies in camelid species (Hamers-Casterman et al. Nature, 1993).

The antigen binding fragment of these antibodies comprise one single domain, also known as Nanobody (Muyldermans, Ann Rev Biochem, 2013).

A technology was developed whereby llamas, alpacas or dromedaries are first immunized.

We then clone, in *E.coli*, the Nanobody repertoire from the peripheral blood lymphocytes of this animal.

By phage display, you will retrieve the most potent antigen binding nanobodies out of this library (Pardon et al. Nat. Protocol., 2014) and their biochemical properties will be characterized.

Our team will assist you in engineering the nanobody to be used eventually (i) as a research tool (for examples, see review in De Meyer et al., Trends Biotechnol, 2014 or Helma et al. J.Cell Biol., 2015) or (ii) to design innovative diagnostic tests for various diseases, infections and pathologies.

Some of the nanobodies (e.g. against cancer biomarkers, snake or scorpion toxins) might be engineered and developed for therapy (Hassanzadeh-Ghassabeh et al., Nanomedicine, 2013; Dekempeneer et al., Expert Opin.Biol.Ther., 2016).