



UNIVERSITÀ
DEGLI STUDI
DI PADOVA



**10-12, November 2025
h 14.00-16.00**

Nanobodies or camelid antibody fragments: properties and applications

Mireille Dumoulin, Ph.D

NEPTUNS, Nanobodies to Explore Protein Structure and
Functions, Centre for Protein Engineering,
InBIOS, University of Liège, Belgium

Place: Department of Pharmaceutical and Pharmacological Sciences
Aula:6

Info: patrizia.polverinodelaureto@unipd.it

To enroll

<https://medicina.elearning.unipd.it/course/view.php?id=7255>



UNIVERSITÀ
DEGLI STUDI
DI PADOVA



Lecture 1,

1- What are Nanobodies? This part will explain how Nanobodies were discovered and give an overview of the unique properties of Nanobodies compared to those of conventional antibody fragments such as Fab, and ScFv.

2- How Nanobodies are generated and characterized? This lecture will introduce the different steps involved to generate and select Nanobodies against a given antigen, and to characterize them in term of affinity, specificity, epitope mapping, stability using various a range of technics including ELISA, SPR, Biolayer interferometry, ITC, fluorescence and circular dichroism

Lecture 2,

How to engineer Nbs to further adapt their properties to the applications: creation of multivalent/multispecific Nanobodies, creation of chimeric Nbs (fusion with toxins, enzymes, etc.). We will discuss protein engineering strategies to improve the pharmacokinetics of Nbs and to label them for in vivo imaging.

Therapeutic, diagnostic and biotechnological application of Nanobodies, part 1

Lecture 3,,

Therapeutic, diagnostic and biotechnological applications of Nanobodies, part 2

Info: patrizia.polverinodelaureto@unipd.it



UNIVERSITÀ
DEGLI STUDI
DI PADOVA



DUMOULIN, Mireille

Nano-antibodies to Explore Protein Structure and Functions (NEPTUNS), Centre for Protein Engineering, InbioS

University of Liège (ULg), Institute of Chemistry, B6c
B-4000 Liège (Sart-Tilman), Belgium

E-mail: mdumoulin@ulg.ac.be;

Tel: 00 32 (0)4 366 3546;

Fax: 00 32 (0)4 366 3364

RESEARCH INTERESTS

I have been working on VHHs for more than 25 years. We select VHHs from camelid heavy-chain only antibodies by phage display and deeply characterize their in vitro properties including affinity, specificity, structure (X-ray crystallography or HDX-MS) and biological activities (e.g., inhibition of enzyme activity, inhibition of fibril formation, etc). We collaborate with various groups to investigate the therapeutic potential of VHHs in vivo using mice models. The diseases we are interested in comprise amyloid diseases, infectious diseases and antibiotic resistance, multiple myeloma and lungs diseases.

Info: patrizia.polverinodelaureto@unipd.it