

Corso di laurea Magistrale in
Pharmaceutical Biotechnologies
A.A. 2017–2018

PROGRAMMA Teaching Staff
LLP/ERASMUS

Short Course

Nanobodies or camelid antibody fragments: properties and applications

Mireille Dumoulin, PhD

Centre for Protein Engineering

Laboratory of Enzymology and Protein Folding

Institute of Chemistry

University of Liege Sart Tilman

LIEGE, Belgium

mdumoulin@ulg.ac.be

Lecture 1, November 28th (2 hrs), Aula Zancan, h 14.30:

- 1- What are Nanobodies? This part will explain how Nanobodies were discovered and give an overview of the unique properties of Nanobodies compare 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.
- 3- Therapeutic, diagnostic and biotechnological applications of Nanobodies. We will focus on the possibilities to use Nanobodies as: *in vivo* imaging agents, leads to derive peptide-based drugs, modular building blocks for manifold constructs, etc... Examples of the use of Nanobodies for research on cancer and degenerative diseases will also be addressed.

Lecture 2, November 29th (2 hrs), Aula Zancan, h 14.30:

Protein folding and stability. This part will essentially focus on the procedures used to practically investigate protein folding and protein stability. It will also introduce the different strategies available to engineer proteins with increased stability and functionalities. Studies on Nanobodies will be particularly discussed.

Lecture 3, December 1st (2 hrs), Aula Zancan, h 14.30:

Advanced concepts on protein structure/function

This lecture will essentially focus on functional amyloid fibrils (both natural and artificial) and on proteins that need to (partially) unfold to be functional. We will discuss a series of case studies.

Evaluation test: 0.5 h

Final test: multiple choice test

Venue: Dipartimento di Scienze del Farmaco, Università di Padova, via Marzolo 5, Padova

Info and registration: patrizia.polverinodelaureto@unipd.it