RESEARCH DOCTORATE IN
"TECHNOLOGIES OF BIOLOGICALLY ACTIVE SUBASTANCES"
Coordinator of the Teaching Staff
Prof. GAETANO GIAMMONA

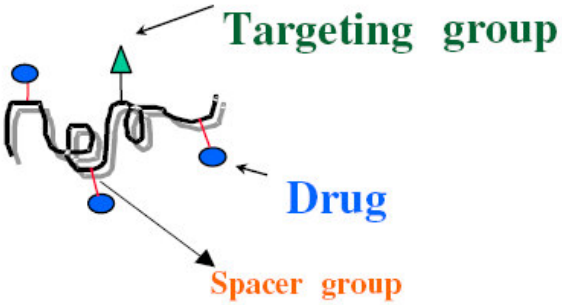
Administrative Center:
University of Palermo (Department of Pharmaceutical Chemistry and Technologies) - Italy
Associated Centers:
University of Bari (Pharmaceutical and Chemical Department) and University of Catania (Department of Pharmaceutical Sciences) - Italy
Duration of the Course: 3 years
Entrance to Course: by competition based on examinations and qualifications.
Required language: English
Stage abroad: 6-12 months
Job opportunities: Pharmaceutical and/or Cosmetic Industry for the production and the control as well as in Research and Development field. Public Institutions for analytical expertises. Public or private centres.
Programme and tools of the course:
The principal aim of the Research Doctorate in "Tecnologies of biologically active substances" is the training of researchers able to work in the pharmaceutical industry for the production of conventional dosage forms and, overall, for the preparation and characterization of innovative dosage forms, such as therapeutic systems able to perform a modified drug release.
The student must:
1) to choice a research programme
2) to perform this research and the correlated study in the laboratory of an assigned tutor
3) to perform an optional stage in another laboratory (Italian or foreign)
4) to attend university courses and participate to teaching programme to consolidate its scientific knowledges. These lectures will be done by Italian and foreign professors
5) to perform periodical reports to tutor and an annual report to all members of the Teaching Staff.

The student will must attend Workshop, Congresses and Symposia concerning Pharmaceutical and Cosmetic Technologies. Courses concerning the use of principal software for the biomedical and biopharmaceutical analyses and for the control of pharmaceutical dosage forms are also envisaged.

Research topics:

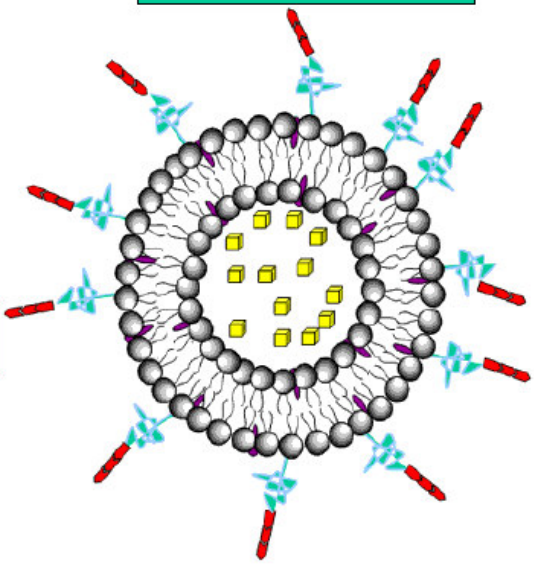
1) TECHNOLOGIES OF THERAPEUTIC SYSTEMS
2) TECHNOLOGIES OF COSMETIC FORMULATIONS
3) ANALYTICAL CONTROL OF PHARMACEUTICAL AND COSMETIC FORMULATIONS

The following images, represent schematically, some systems investigated in the topic n. 1.

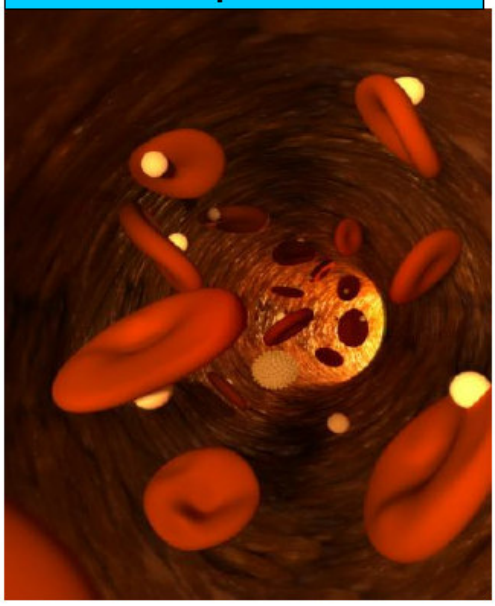


Macromolecular prodrugs

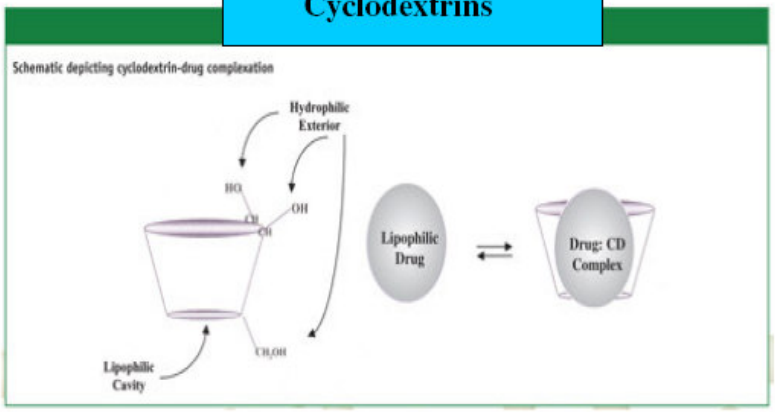
Liposomes

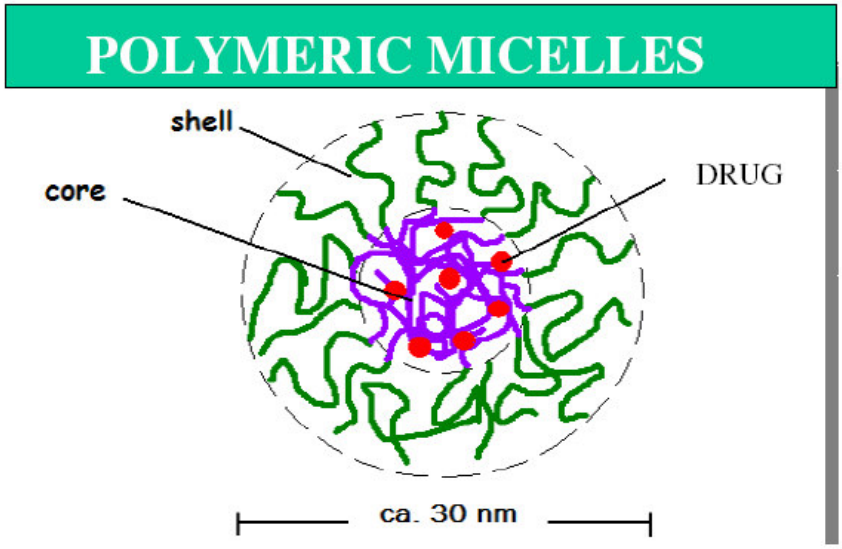


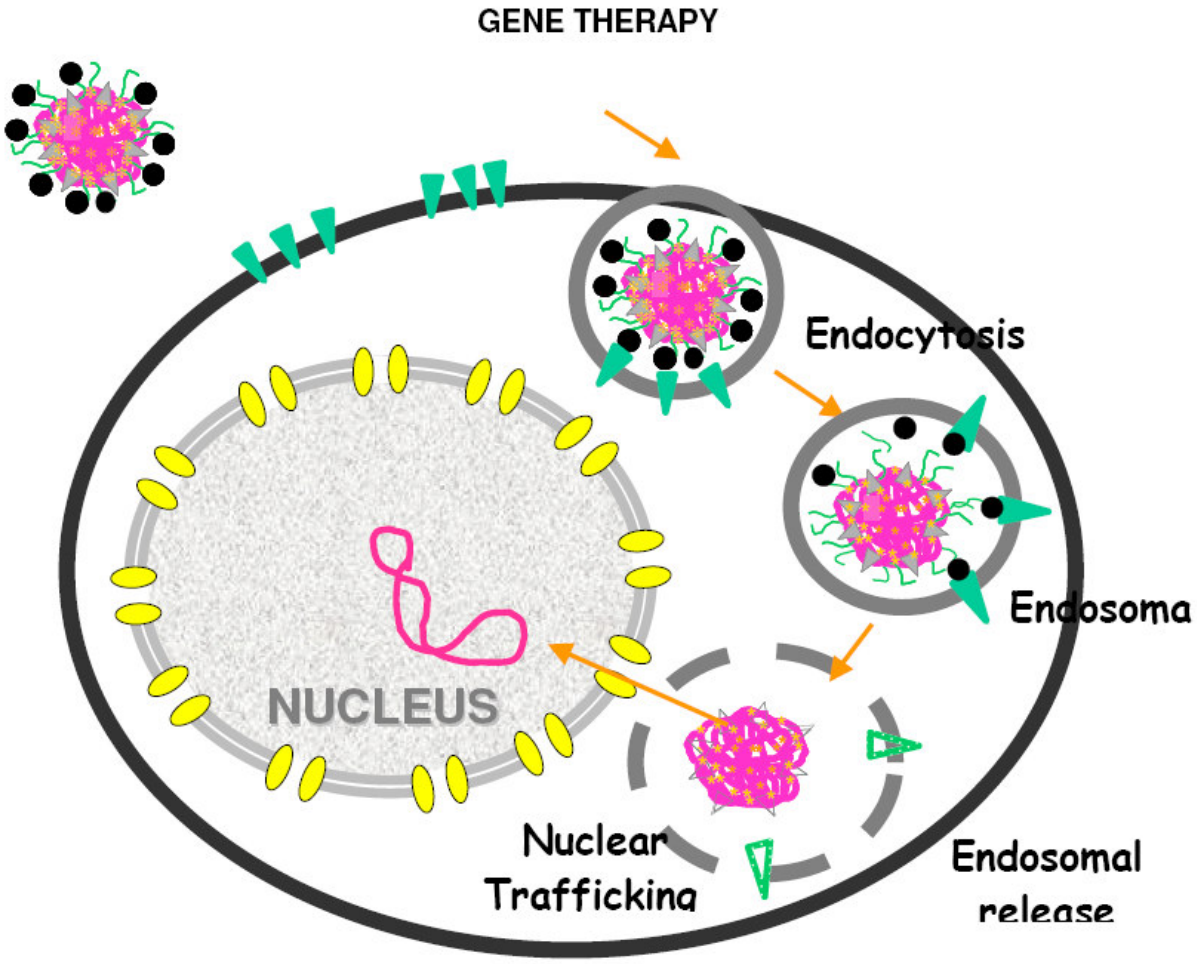
Nanoparticles



Cyclodextrins




POLYMERIC MICELLES
shell
core
DRUG
ca. 30 nm


GENE THERAPY
Endocytosis
Endosoma
NUCLEUS
Nuclear
Trafficking
Endosomal
release

Coordinator of the Teaching Staff

Giammona Gaetano - Full Professor, Faculty of Pharmacy, University of Palermo, Department of Pharmaceutical Chemistry and Technologies

Teaching Staff

1. **Bonina Francesco Paolo** – Full Professor, Faculty of Pharmacy, University of Catania
2. **Castelli Francesco** - Full Professor, Faculty of Pharmacy, University of Catania
3. **Cavallaro Gennara** – Full Professor, Faculty of Pharmacy, University of Palermo
4. **Corsaro Antonino** – Full Professor, Faculty of Pharmacy, University of Catania
5. **Puglisi Giovanni** – Full Professor, Faculty of Pharmacy, University of Catania
6. **Trapani Giuseppe** – Full Professor, Faculty of Pharmacy, University of Bari
7. **Franco Massimo** – Associate Professor, Faculty of Pharmacy, University of Bari
8. **Giannola Libero Italo** – Associate Professor, Faculty of Pharmacy, University of Palermo
9. **Latrofa Andrea** - Associate Professor, Faculty of Pharmacy, University of Bari
10. **Pignatello Rosario** – Associate Professor, Faculty of Pharmacy, University of Catania
11. **Pitarresi Giovanna** – Associate Professor, Faculty of Pharmacy, University of Palermo
12. **Licciardi Mariano** – Researcher, Faculty of Pharmacy, University of Palermo
13. **Lopedota Angela Assunta** – Researcher, Faculty of Pharmacy, University of Bari

Scientific importance of the Research Doctorate in
"TECHNOLOGIES OF BIOLOGICALLY ACTIVE SUBASTANCES"

In the last years, the research in the pharmaceutical and biomedical field is focused in development and characterization of novel materials and systems able to improve the efficiency and efficacy of conventional drugs as well as of biotechnological active substances. The interests and the topics of the Research Doctorate in **"TECHNOLOGIES OF BIOLOGICALLY ACTIVE SUBASTANCES"** are addressed to reach this goal. For example the realization of pharmaceutical dosage forms able to perform a modified release, a targeting of drugs, an improvement of patients' compliance. In addition recently, the interest is also focused in the realization of scaffolds for tissue engineering applications. Finally, the evaluation of the efficacy and non toxicity of cosmetic products is also very interesting.

The expertises of the researchers of the University of Palermo, Bari and Catania that participate to the Teaching Staff of this Research Doctorate, allow to perform a research

concerning the above mentioned fields, of high relevance as demonstrated by the great number of scientific publications and patents as well by the collaboration with several foreign colleagues of important Institutions (University and Scientific Centres) working in the field of pharmaceutical technologies.