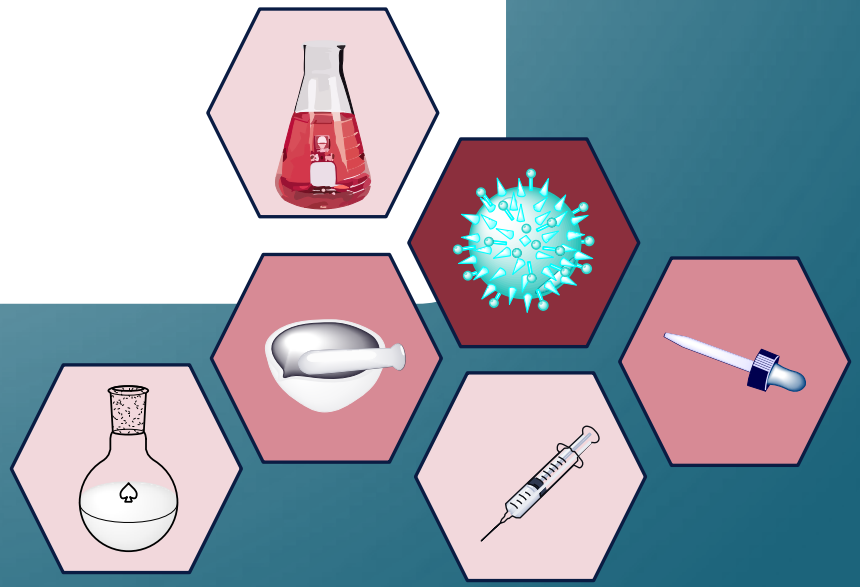
SCIENCES FONDAMENTALES ET INGÉNIERIE
ÉCOLE UNIVERSITAIRE DE RECHERCHE

UNIVERSITÉ CÔTE D'AZUR

Master 2 Research

Medicinal & Bioorganic Chemistry

MedBioChem@UniCA



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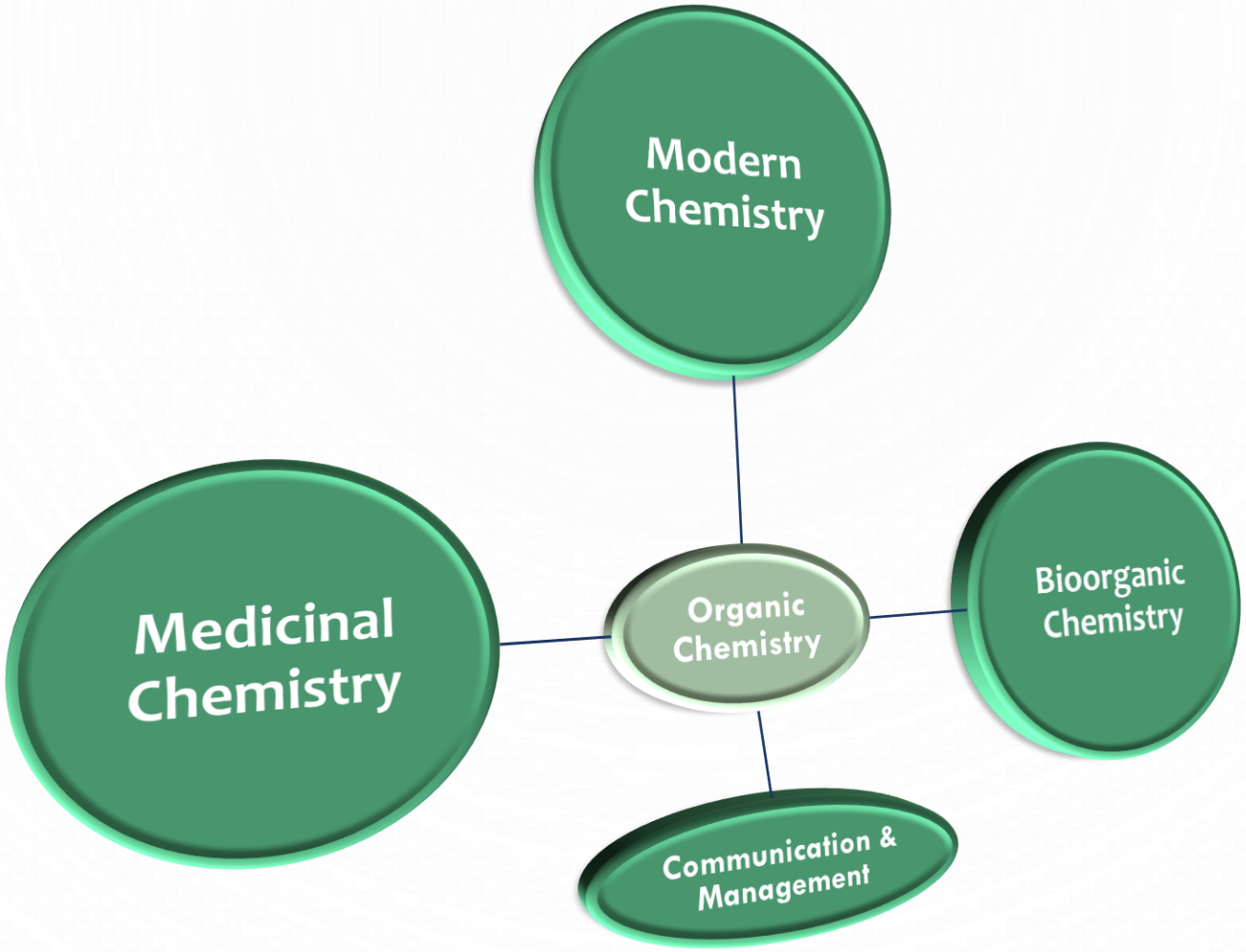


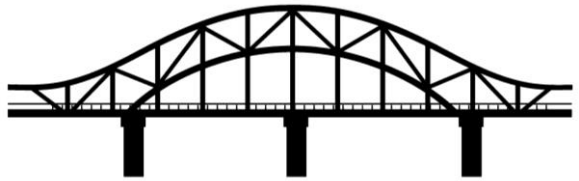
"MASTERING MEDICINAL AND BIOORGANIC CHEMISTRY FOR INNOVATIVE HEALTH SOLUTIONS"

Master Medicinal & Bioorganic Chemistry

Institut de Chimie de Nice

WHY THIS MASTER ??

Licenses UniCA
Chemistry-Biology
Chemistry – Life Sciences

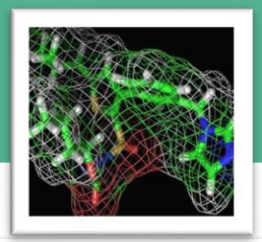



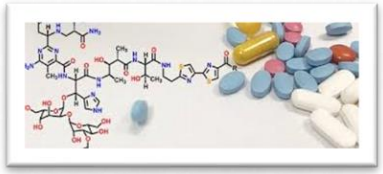
PhD
MENRT, CIFRE,...

INDUSTRY

Start-ups

ROCA THERAPEUTICS · YUKIN Therapeutics · DIMICARE BIOTECH · BiPER Therapeutics

- **Continuity of University Career : bridging 1st and 3rd cycles - Licence to PhD**

- **Dynamic Job Market : Pharmacy, nutrition, perfumes, cosmetics, agriculture, ecological transition**

La chimie verte a le vent en poupe : *les nouveaux diplômés sont très attendus dans les secteurs de la sécurité et l'environnement. – L'Etudiant*

- **Unique Pedagogic Team** in privileged settings : involved, competent, experimented, renowned in their fields
  5 coordinators with identified roles

INVESTISSEMENTS D'AVENIR – INITIATIVE D'EXCELLENCE

UCA J.E.D.I. UNIVERSITÉ CÔTE D'AZUR

Master Medicinal & Bioorganic Chemistry

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All the courses are in english !

I - Biomolecules: structure, interactions and analyses (60 h – 2 UE, 9 ECTS)

II - Modern Chemistry (60 h – 2 UE, 9 ECTS)

III - Medicinal Chemistry (60 h – 2 UE, 9 ECTS)

IV - Management, Quality & Communication (20 h – 1 UE, 3 ECTS)

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I - Biomolecules: structure, interactions and analyses (60 h – 2 UE, 9 ECTS)

I – A. Structure, fonctions & synthesis (20 h – UE1, ECUE#1, 3 ECTS)
Proteins, nucleic acids, Biomolecule labeling/bioconjugation, click chemistry

I – B. Biomolecule/ligand interactions (20 h – UE1, ECUE#2, 3 ECTS)
Targets : proteins (enzymes, receptors, Protein/Protein Interactions) ; Nucleic Acids.
Ligand types: enzyme Inhibitors, Agonists/Antagonists, nucleic acid ligands and protein/protein interaction inhibitors) Biomolecular Binding Concept : kinetic and thermodynamic theories.

I – C. Analysis of biomolecule/ligand interaction (20 h – UE2, 3 ECTS)
NMR (1D & 2D), MS, IR, electrophoresis, radioactive and immunochemical methods, biochemical techniques

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II - Modern Chemistry (60 h – 2 UE, 9 ECTS)

II – A. Modern chemistry & catalysis (45 h – UE1, 6 ECTS)

Industrial synthesis - medicinal chemistry: concepts of heterocyclic chemistry, introduction of fluorine, C-H activation

Catalysis: organocatalysis, enzymatic catalysis, metallocatalysis including asymmetric catalysis

Retrosynthesis & AI: retrosynthetic schemes, notions of synthons and retrons (opening IA-based softwares)

Chemistry of natural products - Total synthesis

I – B. Sustainable & Green Chemistry (15 h – UE2, 3 ECTS)

Green chemistry: 12 principles, E factor, water chemistry and industrial processes

Sustainable chemistry: green solvents - Ionic liquids, Eutectics, biobased solvents and supercritical CO_2, sustainable catalysis + flow chemistry

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III - Medicinal Chemistry (60 h – 2 UE, 9 ECTS)

III – A. Conception/Drug Design (20 h – UE1, 3 ECTS)
Pharmacological metrics and computer-based methods
Ligand-based methods (QSAR, virtual screening, fragment-based drug design, machine learning…)
Structure-based techniques (AlphaFold, dockings,…)
Practical courses on computers with Autodock and Knime

III – B. Medicinal Chemistry, Pharmacology & Drug development (22 h – UE2, ECUE#1, 3 ECTS)
Global process of drug discovery and drug development
Core medicinal chemistry: concept of pharmacophore, analogues synthesis, structure-activity relationships,…
Bases of pharmacology and toxicology, pharmacokinetics and pharmacodynamics, ADMET profiling, target engagement
Main classes of drugs: mode of action and the concept of drug resistance

III – C. Formulation & drug delivery (6 h) (18 h – UE2, ECUE#2, 3 ECTS)
Solid-state analysis and polymorphism of active pharmaceutical ingredients
Formulation & excipients : drug ingredient & drug product.
Vectorisation: prodrogues, nanoparticules, antibodies

IV - Management, Quality & Communication (20 h – 1 UE, 3 ECTS)

Useful knowledge and tools for the future medicinal and bioorganic chemists:

Scientific communication & reporting, scientific reports, oral presentations, scientific ethics
Project- and people management, organizational management (project steering and management,...);
Regulatory quality (regulatory bases and main standards). Basics of quality assurance and quality management, major stages in implementing a quality system..
Basics of intellectual property, patents, licenses

Weekly seminars hosted at the Institut de Chimie de Nice, starring eminent university professors and industrial researchers !

Master Medicinal & Bioorganic Chemistry

How to apply ?

Conditions of applications

- Admission criteria for the **Medicinal & Bioorganic Chemistry** research track:Students must hold a Master's 1 in Chemistry.
- Student applications are reviewed by a teaching committee to determine eligibility.
- International students coming from select countries* are required to submit their application through Campus France.
- All other applications must be submitted online via eCandidat.

** South Africa, Azerbaijan, Algeria, Saudi Arabia, Argentina, Bahrain, Benin, Bolivia, Brazil, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Chili, China, Colombia, Comoros, Congo, South Korea, Ivory Coast, Djibouti, United Arab Emirates, Egypt, Ecuador, United States of America, Gabon, Georgia, Ghana, Guinea, Haiti, India, Indonesia, Iran, Japan, Jordan, Kenya, Kuwait, Laos, Lebanon, Madagascar, Malaysia, Mali, Morocco, Mauritius, Mauritania, Mexico, Niger, Nigeria, Peru, Qatar, Democratic Republic of the Congo, Dominican Republic, United Kingdom, Russia, Senegal, Singapore, Taiwan, Chad, Thailand, Togo, Tunisia, Turkey, Ukraine, Vietnam.*

All applications must be submitted via eCandidat.
February 26th – March 24th

Tuition fees for the Master are set at the national level.

Tuition for international students outside of the EU is set at € 3,770.

Contact us !

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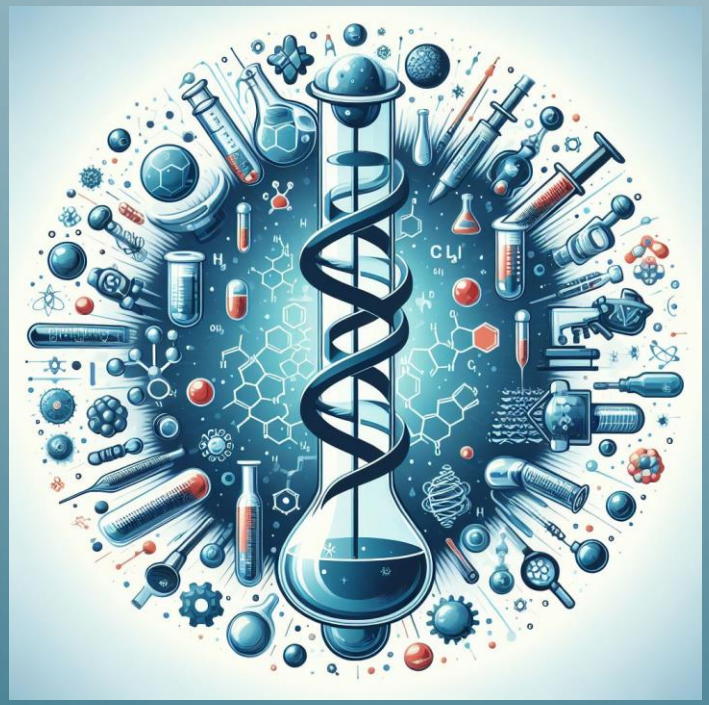

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Join us !