

STUDY GUIDE

A BIOINORGANIC APPROACH TO NEURODEGENERATIVE DISEASES

Organised by
University of Catania

1. IDENTIFYING DATA.															
• Course Name.	A bioinorganic approach to neurodegenerative diseases														
• Coordinating University.	University of Catania														
• Partner Universities Involved.															
• Course Field(s).	General Chemistry, Bioinorganic Chemistry														
• Related Study Programme.	doctorate														
• ISCED Code.	0531														
• SDG.	Good Health and Well-Being														
• Study Level.	D														
• EUNICE Key Competencies	<p>[Indicate the Key Competencies required for the course.]</p> <ul style="list-style-type: none"> • Green – strongly • Orange- moderately • Red – partially • Blank cell - not at all <table border="1"> <tbody> <tr> <td>Problem solving</td> <td></td> </tr> <tr> <td>Teamworking</td> <td></td> </tr> <tr> <td>Communication</td> <td></td> </tr> <tr> <td>Self-management</td> <td></td> </tr> <tr> <td>Cognitive flexibility</td> <td>Orange</td> </tr> <tr> <td>Digital competence</td> <td></td> </tr> <tr> <td>Technical competence</td> <td>orange</td> </tr> </tbody> </table>	Problem solving		Teamworking		Communication		Self-management		Cognitive flexibility	Orange	Digital competence		Technical competence	orange
	Problem solving														
	Teamworking														
	Communication														
	Self-management														
	Cognitive flexibility	Orange													
	Digital competence														
	Technical competence	orange													

	Global intercultural competence	orange
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• Number of ECTS credits allocated.	2
• Mode of Delivery.	Onsite / online live on MS Teams
• Language of Instruction.	Italian/English
• Course Dates.	March-April
• Precise Schedule of the Lectures.	12 h
• Key Words.	Bioinorganic chemistry, metal ions, neurodegenerative diseases
• Catchy Phrase.	Metal ions involvement in neurodegenerative diseases and experimental techniques used to investigate this issue

• Prerequisites and co-requisites.	[Provide information on: - The student must have a good chemistry and/or biochemistry base; - The study levels this course is available for D; - Required: English
• Number of EUNICE students that can attend the Course.	60
• Course inscription procedure(s).	Indicate the registration procedures if it differs from the standard EUNICE process

2. CONTACT DETAILS.

• Department.	Department of Chemical Sciences
• Name of Lecturer.	Giuseppe Grasso
• E-mail.	grassog@unict.it
• Other Lecturers.	

3. COURSE CONTENT.

Brief overview of neurodegenerative diseases: a bioinorganic point of view. Alzheimer's disease. Parkinson disease. Prion diseases. Catabolism of aggregation-prone proteins. A β , α -synuclein and prion protein. Protein-metal ions binding. Chemical factors regulating the clearance of proteins by

metalloproteases: oxidative stress, small molecules and metal ions. Metal ions and metalloproteases at physiological conditions and in neurodegeneration. Some of the most commonly used experimental techniques to study metal binding to proteins.

4. LEARNING OUTCOMES.

The student will know the main biomolecular mechanisms involved with neurodegenerative diseases and the role that metal ions have in these diseases. Possible therapeutical strategies to tackle those diseases will be defined. The student will get to know the most recent literature on this field and the current experimental research strategies applied to study the biomolecular mechanisms of these diseases.

5. OBJECTIVES.

Mechanisms of Protein misfolding;
Involvement of metal ions in neurodegenerative diseases;
Metalloproteases and regulation of their activity;
Experimental approaches to investigate the bioinorganic aspects of neurodegenerative diseases.

6. COURSE ORGANISATION.

UNITS

1. Mechanisms of Protein misfolding and neurodegenerative diseases;
2. Metal ions in neurodegenerative diseases;
3. Metalloproteases and regulation of their activity;
4. Experimental approaches to investigate the bioinorganic aspects of neurodegenerative diseases.

LEARNING RESOURCES AND TOOLS.

Lecture slides, literature, books

PLANNED LEARNING ACTIVITIES AND TEACHING METHODS.

Lectures and lab description

7. ASSESSMENT METHODS, CRITERIA AND PERIOD.

Written exam at the end of the course

OBSERVATIONS.

8. BIBLIOGRAPHY AND TEACHING MATERIALS.

Biological inorganic Chemistry. An Introduction. Robert Crichton
 Bioinorganic chemistry. A short course. Rosette M. Roat-Malone
 Literature on line
 Slides of the lectures