



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## COURSE SYLLABUS

### Bioinorganic Chemistry

2324-1-F5401Q023

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#### Aims

The aim of the course is to illustrate properties, structures, reactivity, biological functions and methods of characterization of compounds of bioinorganic relevance.

#### Contents

Introduction to bioinorganic chemistry

Physical and spectroscopic methods for the characterization and study of bioinorganic systems

Fundamentals of electron transfer theory (Marcus theory and quantum tunneling);

Structure and function of metal proteins for electron transfer

Electron transport: the case of cytochrome c oxidase

Photosynthesis and PSII

Detoxification and activation of O<sub>2</sub>

Role of metals in diseases: the case of copper in neurodegenerative diseases

Activation and catalysis of small molecules (CO<sub>2</sub>, CH<sub>4</sub>, CO, H<sub>2</sub>)

Heme and non-heme metallo proteins for the activation of recalcitrant substrates

#### Detailed program

## **Prerequisites**

Basic knowledge of biochemistry (proteins, DNA and RNA, metabolic pathways, etc.) and of the chemical-physical properties of metal ions and coordination compounds

## **Teaching form**

lessons regarding the conceptual aspects and monographic seminars

## **Textbook and teaching resource**

I. Bertini, H.B. Gray, E.I. Stiefel, E.S. valentine "Biological Inorganic Chemistry: Structure and Reactivity" University Science Books, Sausalito, California

Course slides and scientific papers

## **Semester**

First year LM - Second Semester

## **Assessment method**

Oral examination

## **Office hours**

Write to [luca.bertini@unimib.it](mailto:luca.bertini@unimib.it)

## **Sustainable Development Goals**

LIFE ON LAND

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