



Università  
degli Studi di  
Messina

DIPARTIMENTO DI SCIENZE BIOMEDICHE,  
ODONTOIATRICHE E DELLE IMMAGINI  
MORFOLOGICHE E FUNZIONALI



## Seminari di Dipartimento BIOMORF

**Lunedì 9 Giugno 2025 - ore 15:00**

*Aula De Simone, piano I-Torre Biologica (Pad. G), A.O.U. "G. Martino"*

### PRESENTAZIONE DELL'EVENTO

**Prof. Sergio Lucio Vinci**

*Direttore Dipartimento BIOMORF, Università degli Studi di Messina*

### INTRODUZIONE

**Prof. Archimede Rotondo/Giuseppe Pellicane**

*Dipartimento BIOMORF, Università degli Studi di Messina*

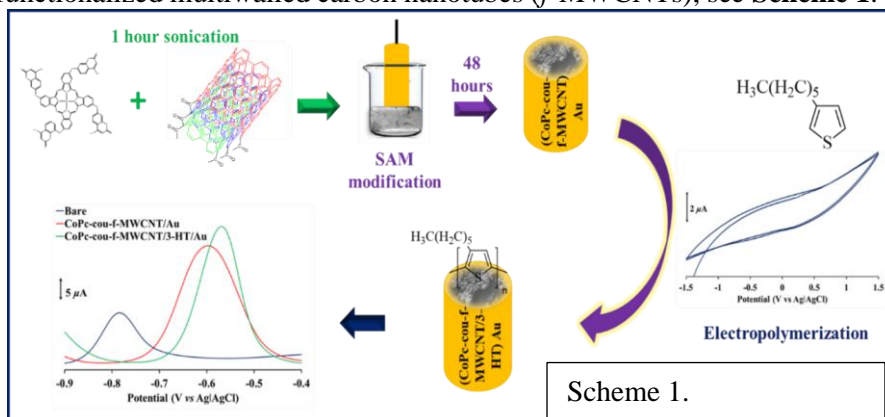
### RELATORE

**Prof. Irvin Noel Booysen**

*School of Chemistry and Physics, University of KwaZulu-Natal, South Africa*

### NANOCONJUGATES WITH METALLOPHTHALOCYANINES AS ELECTROCATALYSTS FOR THE DETECTION OF WATER POLLUTANTS IN REAL SAMPLE

In the realm of electrochemical sensors, metallophthalocyanines (MPcs) can serve as appropriate synthons to fabricate thin films that act as electrocatalysts on working electrodes for the detection of water pollutants. [1, 2] Herein, I will concisely demonstrate the versatility of MPcs and their nanoconjugates in the electrocatalytic detection of metal-based pollutants, pesticides, and pharmaceuticals. For instance, the optimization and application of a gold modified electrode, CoPc-cou-*f*-MWCNTs/3-HT|Au, for the electrocatalytic detection of a water pollutant, paraquat (PQ), were explored. It was fabricated *via* a sequential modification procedure entailing the formation of self-assembled monolayers (SAMs) of a nanocomposite comprising a coumarin *tetra*-substituted cobalt phthalocyanine (CoPc-cou) and carboxylic acid functionalized multiwalled carbon nanotubes (*f*-MWCNTs), see **Scheme 1**.



Scheme 1.

his was followed by the *in-situ* immobilization of poly(3-hexylthiophene) ([3-HT]<sub>n</sub>) through electropolymerisation to render the chemically modified electrode (CME). This CME could electrocatalytically distinguish PQ within a real water sample collected from the Durban lagoon. Recovery of PQ in the lagoon water by the modified Au electrode was found to be 86%, which is lower than the calculated value of 99% obtained by HPLC-MS after rigorous microextraction. Furthermore, I will also briefly highlight selected key questions that I envisage addressing with my prospective collaboration with Prof. G. Pellicane and Prof. A. Rotondo.