



UNIVERSITY OF NAPOLI "FEDERICO II"

POLYTECHNIC AND SCIENCE SCHOOL

Department of Chemical Sciences

Ph.D. School in Chemical Sciences (XXXVII Cycle)



## First year activity

The first year research activity has been directed to the manufacturing of adhesive products based on soy protein isolate (SPI) and phenolic compounds to be used e.g. as surgical glues, and to the re-examination of the oxidative chemistry of 5,6-dihydroxyindole (DHI), a precursor of natural melanins, in the perspective of getting access to new melanin-related materials.

*Bio-inspired hydrogels based on soy protein isolate (SPI) and phenolic compounds*

Denatured SPI + Chlorogenic acid or Gallic acid or Caffeic acid → Hydrogel

Phenolic compound + SPI-based hydrogel

Underwater resistance  
Good stretchability  
Skin adhesiveness (25 times pooling)  
No irritation

Ph.D. Student  
Sara Viggiano

**Title**  
"Natural and bio-inspired phenolic polymers for the design of innovative functional materials: tailoring properties by ad hoc synthesis and chemical manipulation."

*Exploration of 5,6-dihydroxyindole (DHI) oxidation chemistry by mechanochemical methodologies*

DHI + Potassium carbonate → 4,7'-DHI dimer + 4,4'-DHI dimer

Ball Milling 50 oscillation/s 30 min

Ball Mill Fritsch Pulverisette 23