



POLITECNICO DI TORINO  
Repository ISTITUZIONALE

GRAFTING OF POLYPHENOLS FROM GRAPE POMACE TO IMPLANTABLE BIOMATERIALS: A  
CHEMICAL AND BIOLOGICAL CHARACTERIZATION

*Original*

GRAFTING OF POLYPHENOLS FROM GRAPE POMACE TO IMPLANTABLE BIOMATERIALS: A CHEMICAL AND BIOLOGICAL CHARACTERIZATION / SPRIANO, SILVIA; CAZZOLA, MARTINA; FERRARIS, SARA; VERNE', ENRICA; BOSSO, ANTONELLA; GUAITA, MASSIMO; ÖRLYGSSON, GISSUR; CHUEN HOW, NG; TAMBASCO, PAULO. - ELETTRONICO. - (2019). ((Intervento presentato al convegno 13th World Congress on Polyphenols Applications tenutosi a Malta nel 30/09/2019.

*Availability:*

This version is available at: 11583/2828532 since: 2020-05-22T11:53:15Z

*Publisher:*

ISANH

*Published*

DOI:

*Terms of use:*

openAccess

This article is made available under terms and conditions as specified in the corresponding bibliographic description in the repository

*Publisher copyright*

(Article begins on next page)

# GRAFTING OF POLYPHENOLS FROM GRAPE POMACE TO IMPLANTABLE BIOMATERIALS: A CHEMICAL AND BIOLOGICAL CHARACTERIZATION

SILVIA SPRIANO<sup>1</sup>, MARTINA CAZZOLA<sup>1</sup>, SARA FERRARIS<sup>1</sup>, ENRICA VERNE<sup>1</sup>, ANTONELLA BOSSO<sup>2</sup>, MASSIMO GUAITA<sup>2</sup>, GISSUR ÖRLYGSSON<sup>3</sup>, NG CHUEN HOW<sup>4</sup>, PAULO TAMBASCO<sup>5</sup>

<sup>1</sup> Politecnico di Torino -ITALY

<sup>2</sup> CREA, CNR- ITALY

<sup>3</sup> ICI - ICELAND

<sup>4</sup> GENIS - ICELAND

<sup>5</sup> University of Sao Paulo - BRAZIL

Silvia.spriano@polito.it

**Introduction:** Objective of research is exploitation of the great potential benefits of polyphenols for enhancing mineralization and anticancer ability of bioactive materials for bone implants (titanium alloys, bioactive glasses and hydroxyapatite).

**Materials and Methods:** Polyphenols were extracted from grape pomace (GPH). A specific protocol for surface functionalization with GPH was developed case by case considering the different surface chemistry of the substrates. A characterization protocol suitable for all the materials was defined (fluorescent microscopy, Folin & Ciocalteu test applied both to GPH solutions and to surface functionalized samples, DPPH, contact angle, zeta potential titration measurements, bioactivity by soaking in Simulated Body Fluid, HPLC). Sterilization was performed through gamma irradiation. Cell cultures finalized to evaluation of mineralization and anticancer ability of GPH solutions, as well as of functionalized and control hydroxyapatite surfaces were performed.

**Results & Conclusions:** Surface grafting of GPH was positively realized on all the substrates even if in different amount; grafted GPH maintain redox and scavenger activity (even after gamma sterilization), while bioactivity of the substrates is preserved. As assumed, benefits of GPH can be coupled to bioactive substrates. Cytocompatibility, effective mineralization and antitumoral activity of GPH solutions with different concentration and of functionalized surfaces is discussed.