



ISTITUTO ITALIANO
DI TECNOLOGIA
SMART BIO-INTERFACES



ISTITUTO ITALIANO
DI TECNOLOGIA
CENTER FOR MATERIALS
INTERFACES

Grape-derived extracts as potential active pharmaceutical and cosmetic ingredients

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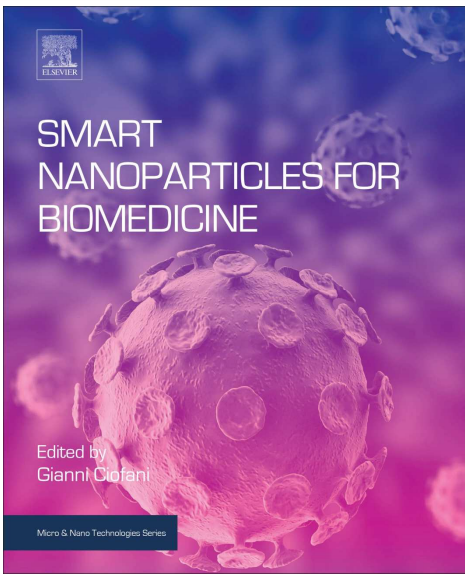
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Our center



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Our research



Edited by
Gianni Ciofani

Micro & Nano Technologies Series

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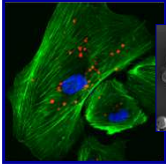
Smart Bio-Interfaces ³



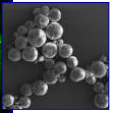
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Our research

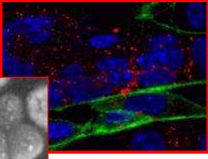
Magnetic fields



Smart nanomaterials



NIR radiation

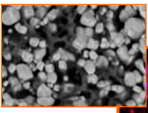




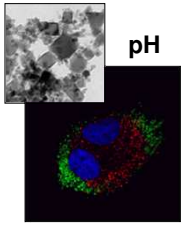
Remote control of biological functions

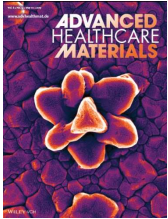


Ultrasounds or vibrations



pH





Genchi G.G., [...], Ciofani G. Remote Control of Cellular Functions: The Role of Smart Nanomaterials in the Medicine of the Future. Adv. Healthc. Mater. 6: 1700002 (2017)



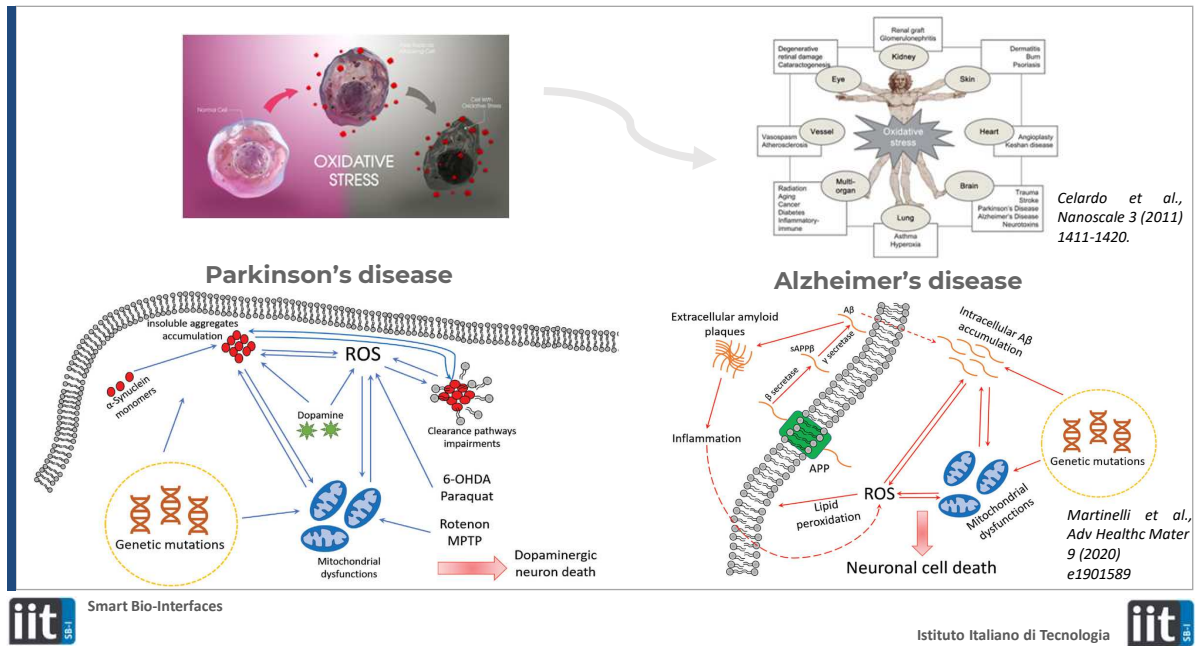
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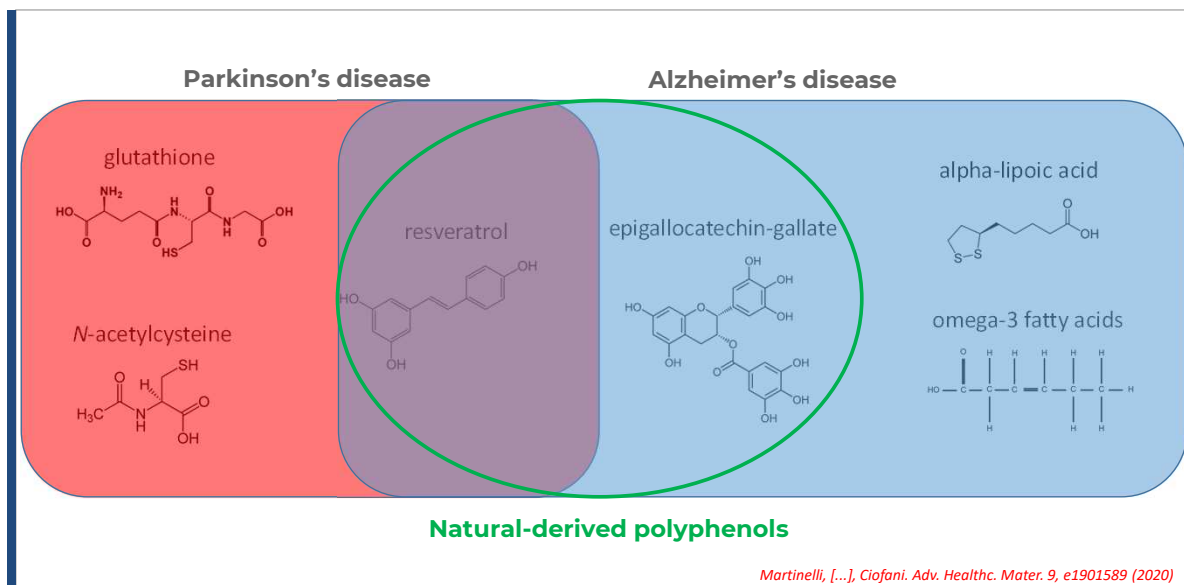
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REACTIVE OXYGEN SPECIES (ROS) IN NEURODEGENERATIVE DISEASES



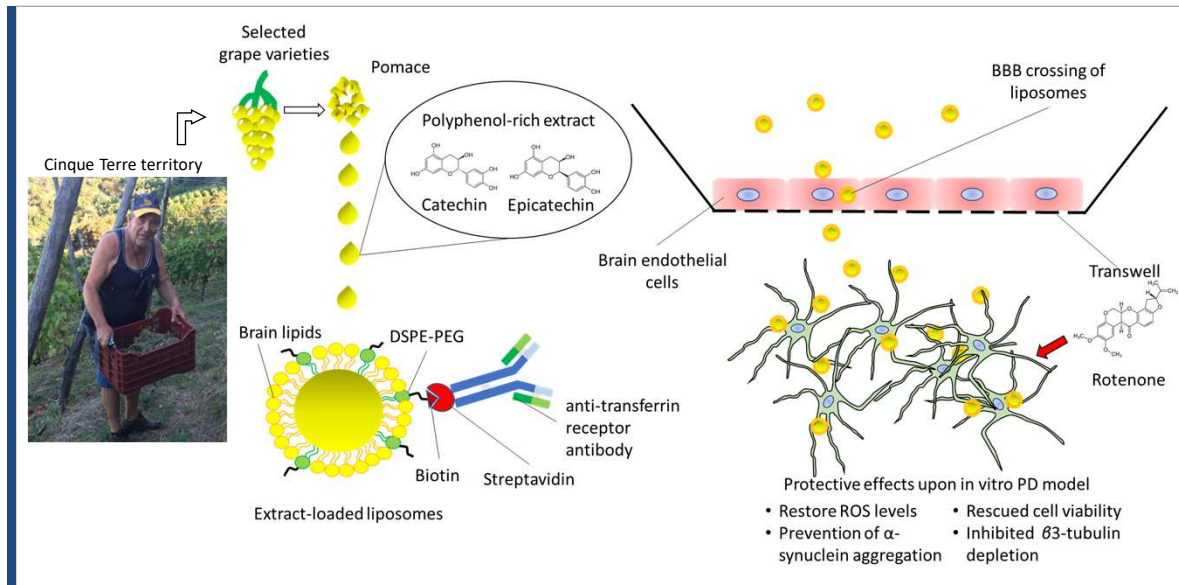
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ANTIOXIDANT MOLECULES USED IN CLINICAL TRIALS



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OUR WORK



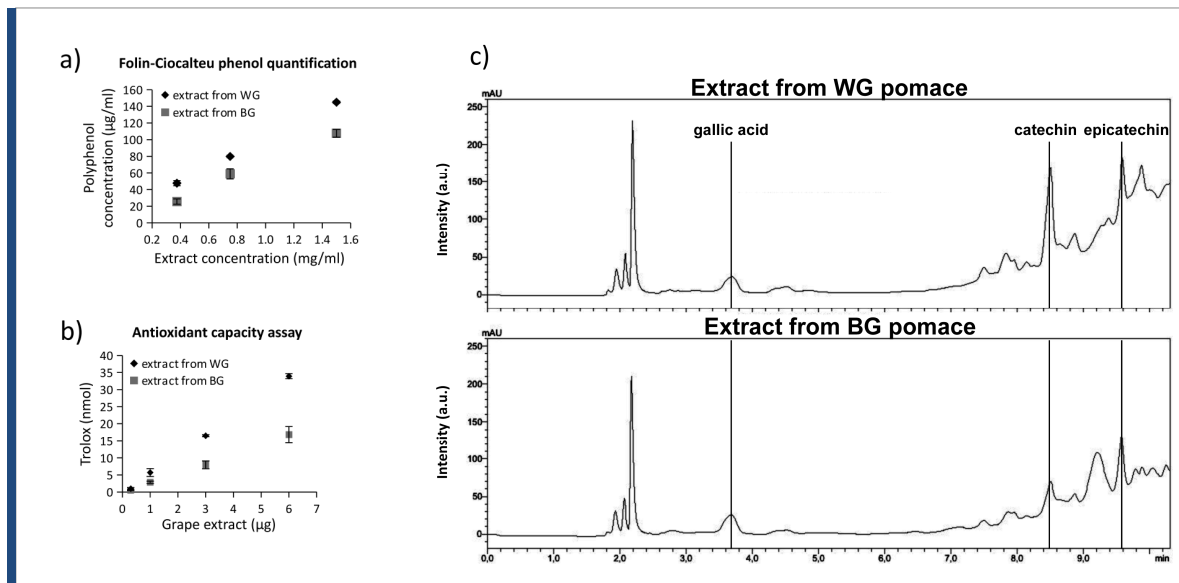
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POLYPHENOLS-RICH EXTRACT FROM GRAPE POMACE 1/2



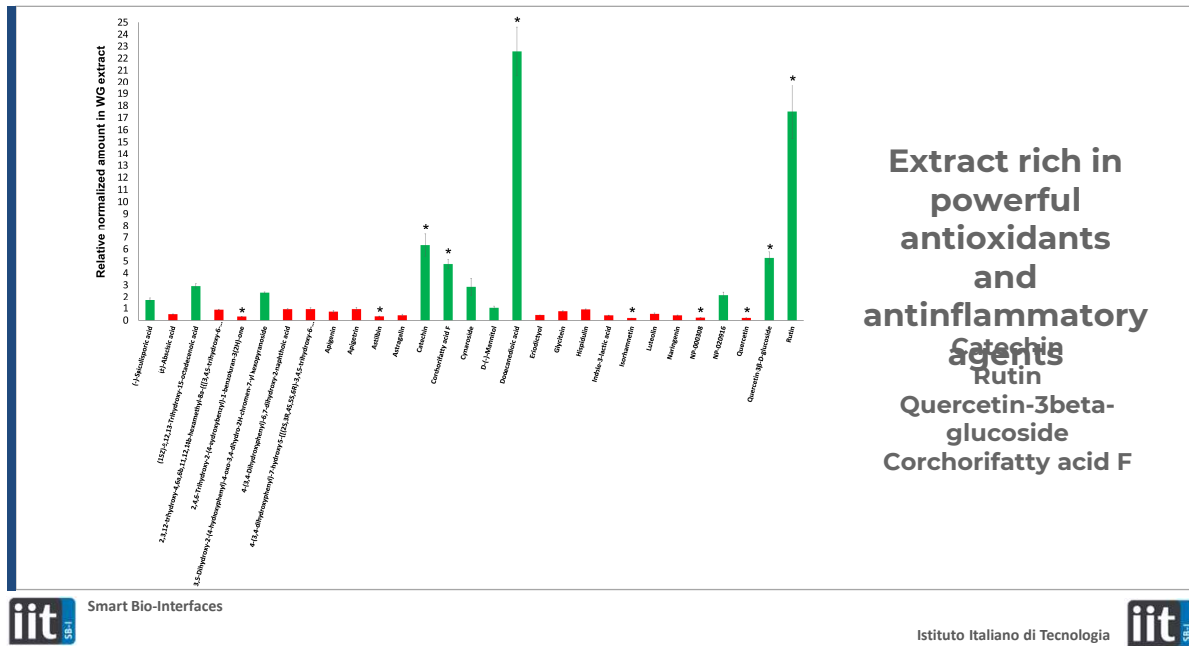
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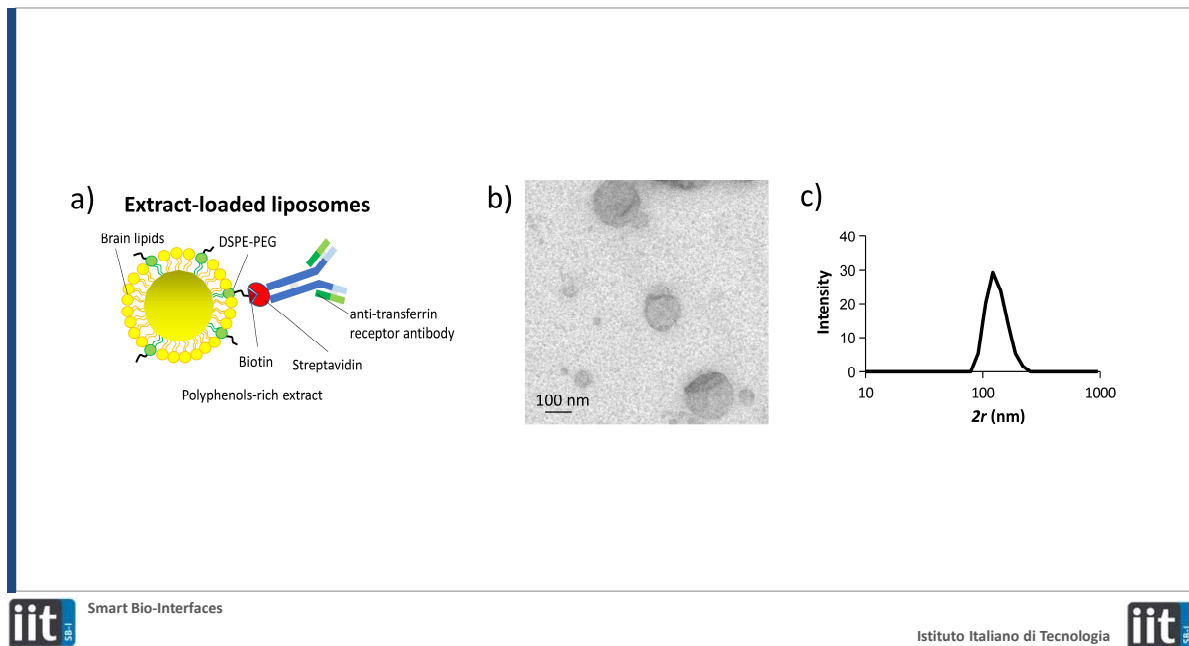
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POLYPHENOLS-RICH EXTRACT FROM GRAPE POMACE 2/2

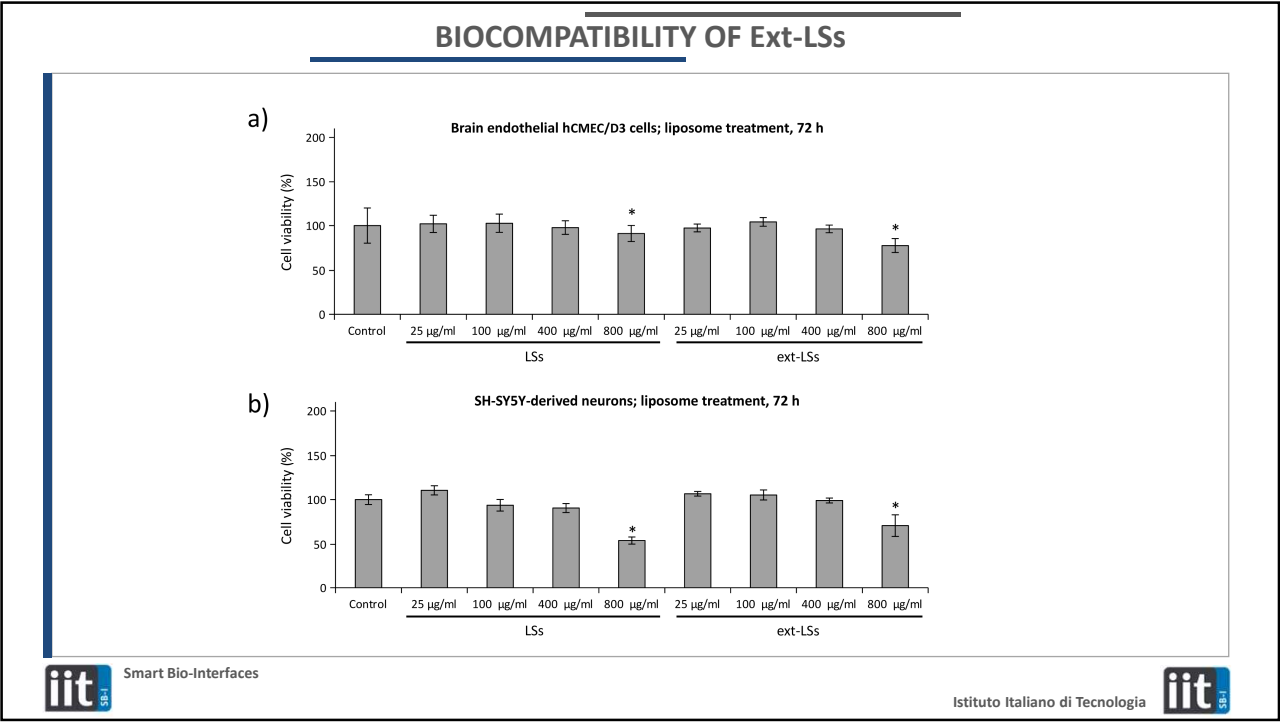


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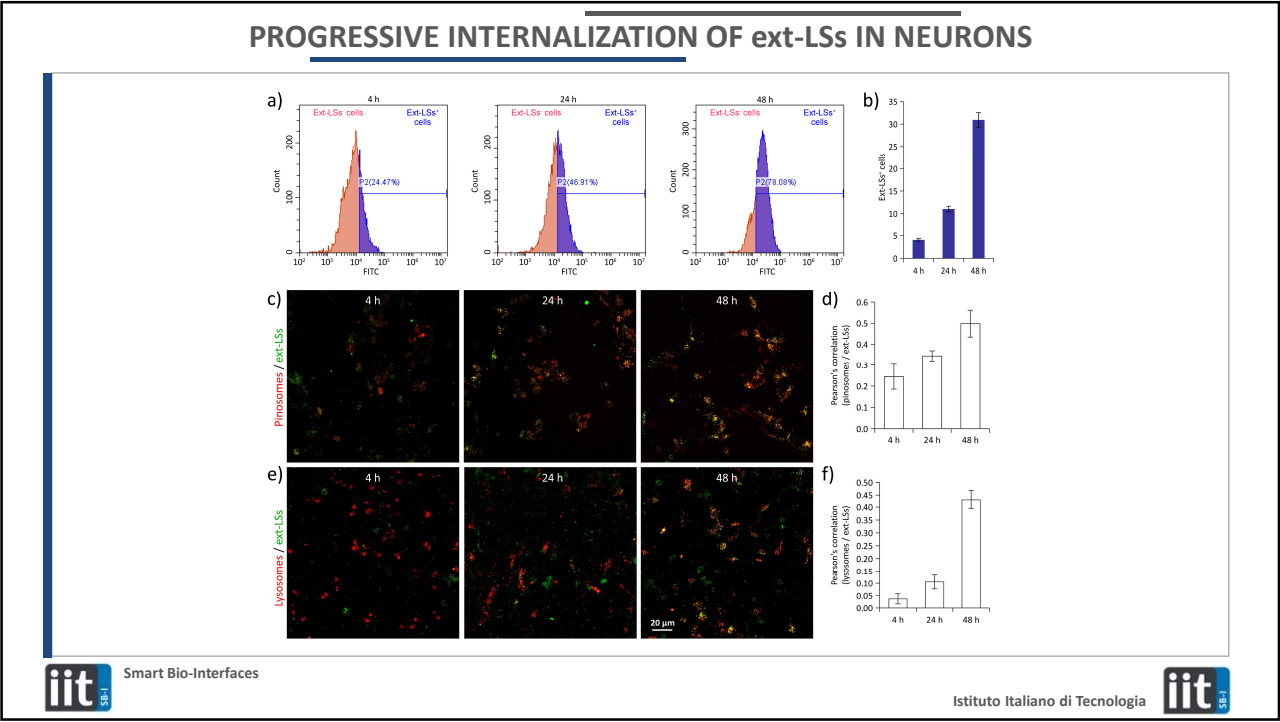
EXTRACT-LOADED LIPOSOMES (ext-LSs)



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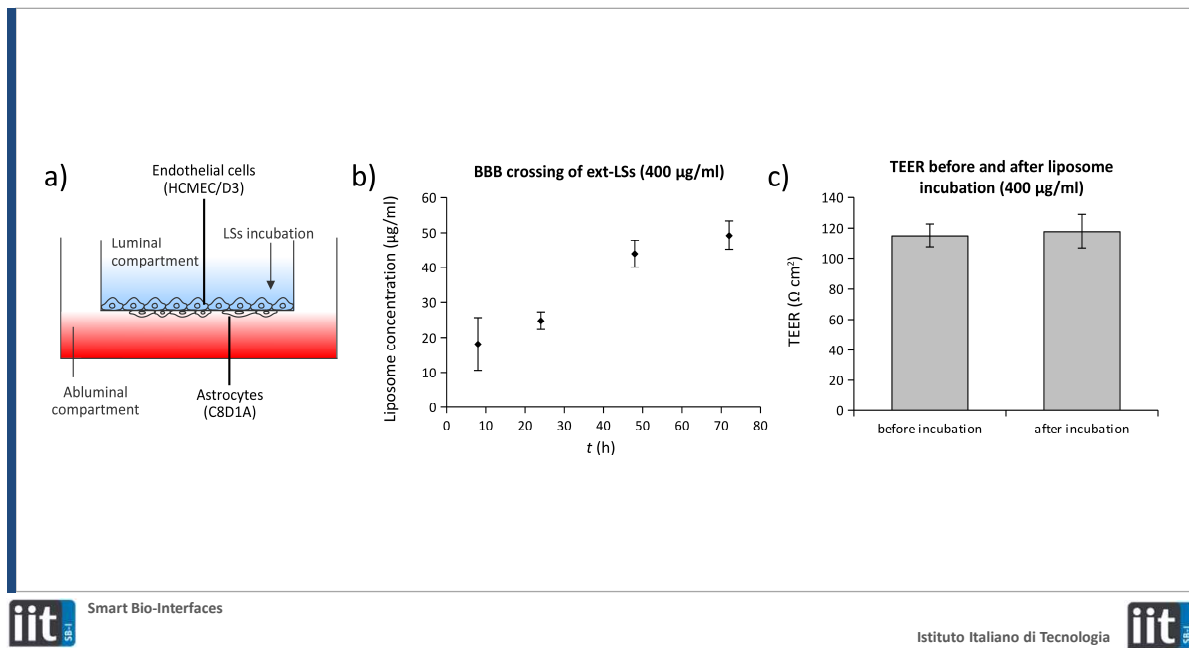


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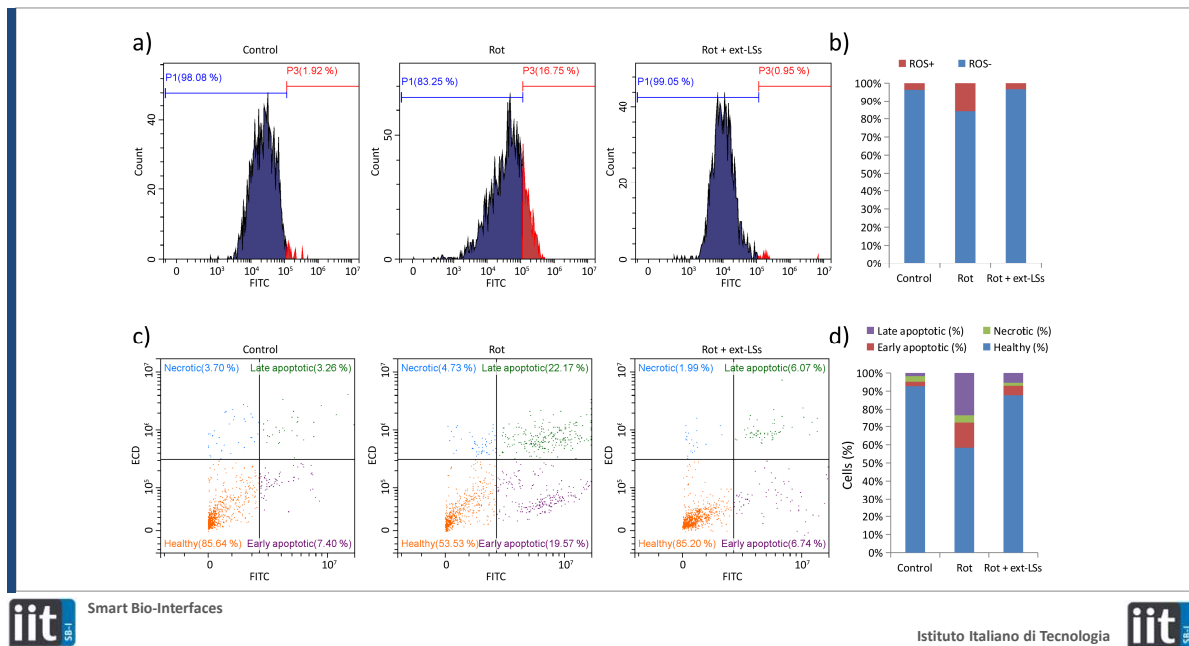
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Ext-LSs EFFICIENTLY CROSS THE BBB MODEL

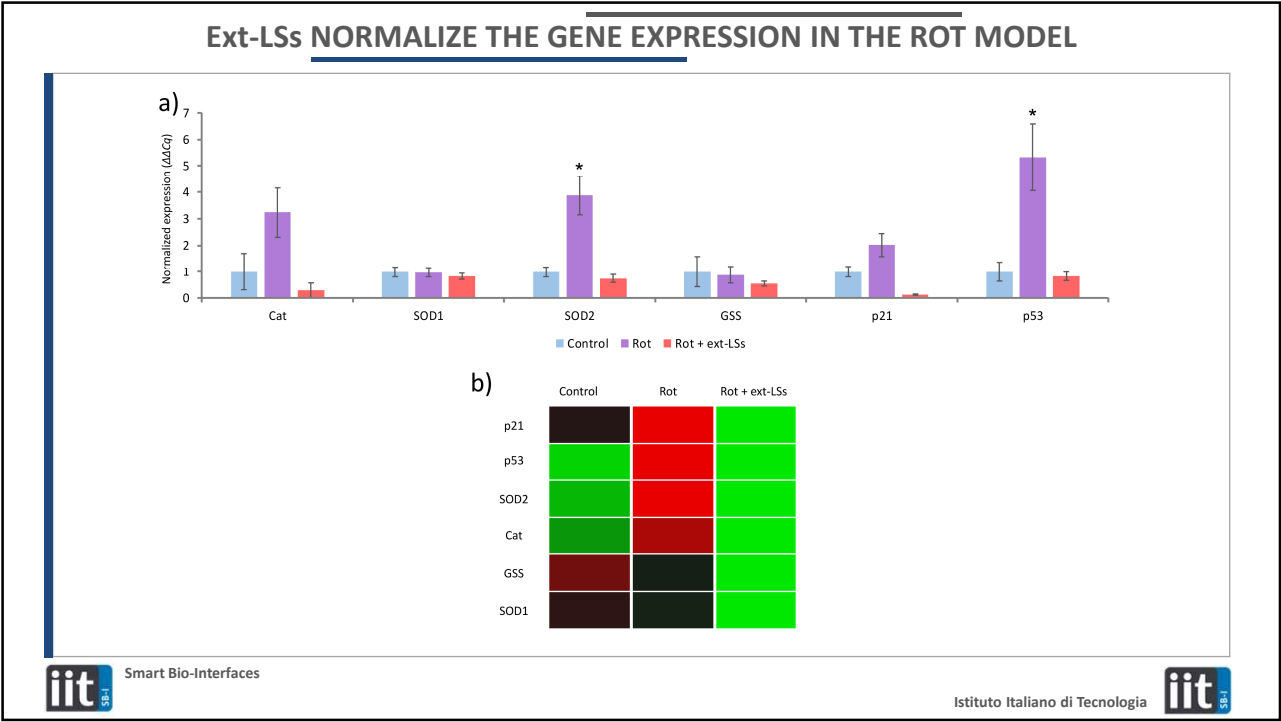


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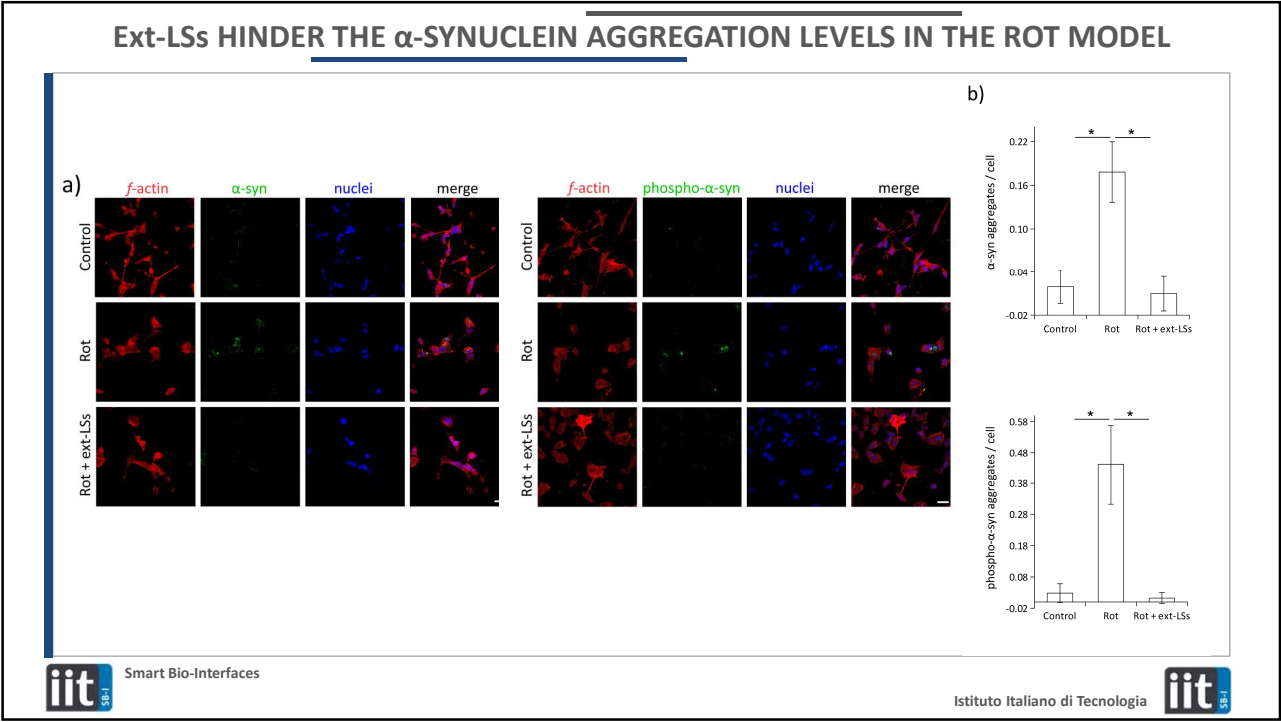
Ext-LSs RESCUE ROS LEVELS AND CELL VIABILITY IN THE ROT MODEL



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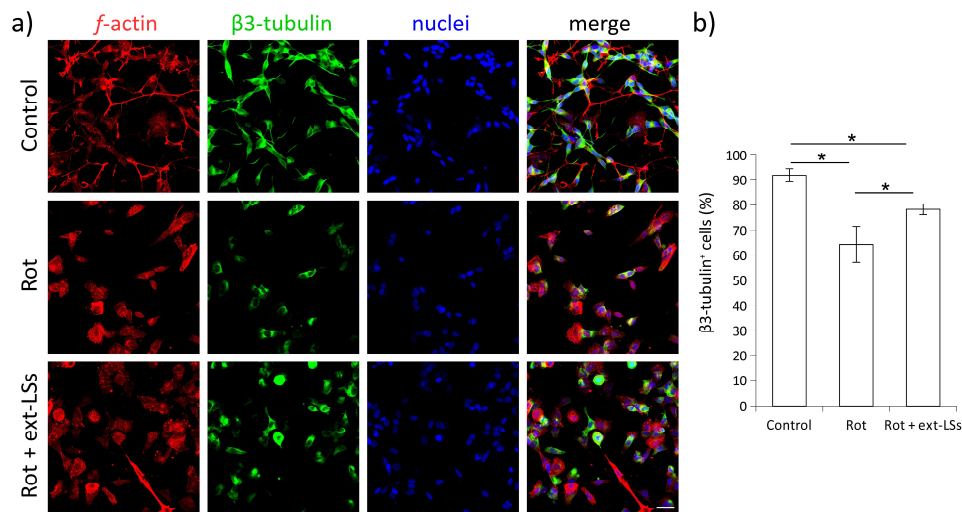


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Ext-LSs PARTIALLY RESCUE THE β 3-TUBULIN EXPRESSION IN THE ROT MODEL



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CONCLUSIONS

Functionalized liposomes loaded with extracts rich in catechins and epicatechins from selected grape pomace

- completely restored the ROS levels,
- prevented the α -synuclein aggregation,
- rescued the cell viability,
- and inhibited the β 3-tubulin depletion in an *in vitro* rot-induced PD model
- Furthermore, the alteration of the gene expression profile in these cells was successfully rescued by ext-LSs.

This antioxidant nanoplatform demonstrated excellent BBB crossing capacity in a multicellular *in vitro* model, paving the way for future preclinical studies.



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Kidaria Bioscience SRL



Marino A., Ciofani G., Desii A., Battaglini M. *Vitis vinifera* white grape pomace extract, compositions and uses thereof. Italian patent application IT102020000015493, 26/06/2020



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Our group



European Research Council

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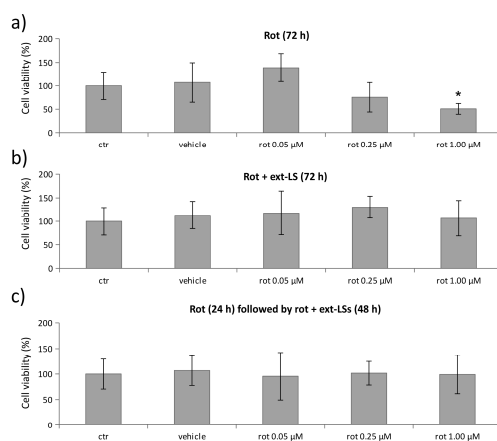
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Thank you for your attention!



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Ext-LSs RESCUE CELL VIABILITY IN THE ROT MODEL



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