



Chinese Academy of Sciences
**Key Lab for Biomedical Effects of
Nanomaterials and Nanosafety**

中科院纳米生物效应与安全性重点实验室



学术报告通知

CAS NS Forum (NO. 359)



演讲者: Massimo Bottini, PhD

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题目: Extracellular vesicle-mediated biomineralization: new opportunities for breast cancer diagnosis and therapy

时间: 2023年05月19日(星期五), 下午14:00

地点: 国家纳米科学中心, 科研楼三层阶梯教室

主持人: 梁兴杰 研究员

报告摘要:

One of the hallmarks of breast cancer is the presence of microcalcifications. However, the biogenesis of these microcalcifications remains largely unexplored. The osteomimicry of breast cancer, that is, the expression of bone-associated proteins by the cells, has suggested that the formation of microcalcifications may follow a similar process as physiological mineralisation. Bone ossification is a result of the work of a special class of extracellular vesicles, called matrix vesicles. Current knowledge describes matrix vesicles as released by outward budding from the apical microvilli of chondrocytes and osteoblasts and acting as mineralization nanoreactors by forming apatitic minerals in their lumen and propagating the minerals on the collagen fibrils. Current knowledge also describes matrix vesicles as harbouring the complete biochemical machinery (proteins and lipids) necessary to act as mineralization nanoreactors. However, the exact biochemical mechanisms, both intracellular and extracellular, driving the biogenesis and function of matrix vesicles remain elusive. In this seminar, after having described what we know and what we do not know about the physiologic and ectopic biomineralization processes, I will describe three research lines that we have been developing aimed at unravelling the role of 1) orphan phosphatase 1 (PHOSPHO1), 2) autophagy and 3) soluble proteins in the biogenesis and function of matrix vesicles. Finally, I will discuss our new research line aimed at elucidating the mechanism(s) driving the formation of breast cancer microcalcifications.

个人简介:

Massimo Bottini is Associate Professor of Biochemistry at the University of Rome Tor Vergata (Rome, Italy) since 2015. As previous positions, he has been Affiliate Associate Professor at the Sanford Burnham Prebys (La Jolla, USA) from 2015 to 2022, and Visiting Professor at the University of the Chinese Academy of Sciences (Beijing, People's Republic of China) from 2017 to 2019 and at the University of São Paulo (São Paulo, Brazil) in 2020. He has been the recipient of fellowships/grants from the Juvenile Diabetes Research Foundation, the Arthritis National Research Foundation, the European Commission, the University of Rome Tor Vergata, and the Chinese Academy of Sciences. He leads the Laboratory of Biochemical Nanotechnology at the University of Rome Tor Vergata. His research is mostly focused on the characterization of the biochemical and biophysical properties of the extracellular vesicles released during physiologic and ectopic biomineralization processes.