Session 2: Bio-Robotics

Date: January 23, 2019

Venue: Knowledge Theater in Grand Front Osaka

"Frontiers of BioRobotics Science and Engineering"

Paolo Dario (Sant'Anna School of Advanced Studies)

Biorobotics and bionics are at the edge of biomedical engineering and robotics. Their goal is using robotic artefacts to validate scientific hypotheses, for inventing and deploying novel biomimetic machines, human-centered healthcare, limb prostheses, artificial organs, rehabilitation and assistive technologies. In this talk numerous examples of research achievements and perspectives will be illustrated.

"The Strength of Being Soft: Lessons from Nature for Soft Robots"

Cecilia Laschi (Sant'Anna School of Advanced Studies)

Inspired by the observation of the role of soft tissues in living organisms, the use of soft materials for building robots is one of the current challenges for pushing the boundaries of robotics technologies. The study of living organisms sheds light on principles that can be adopted to develop new robot abilities and applications.

"Bioinks for 3D Bioprinting of Biomimetic Tissue Models"

Matthew Mail (CELLINK)

3D Bioprinting has gained attention in tissue engineering due to its ability to spa-tially control the placement of cells, biomaterials and biological molecules. The development of new hydrogel based bioinks with high printability and bioactive properties has made it possible to 3D bioprint and accelerate the maturation of complex 3D tissue models. Bioprinting technologies developed by CELLINK, including 3D bioprinters and bioinks, are being applied to regenerative medicine to address the need for tissues and organs suitable for transplantation, cell-based sensors, drug screening models, bio-applications, and tumor models. These bio-inks are optimized for printability, cell viability, and cellular expression, and are made from a range of synthetic, natural, and ECM based biomaterials. The cur-rent design strategy for bioinks is to create environments that support specific cell types or functionalities, while mimicking natural tissues.

An example of this is the CELLINK LAMININK series, which contains five tissue-specific bioinks based on laminin proteins that mimic the basal lamina of natural tissue.

More information will be demonstrated during the presentation, including CELLINK's latest advances in bioinks and biomaterials, and data from our research collaborators.