AAPPS-DPP 2018 Plenary speaker Name: Prof. Masaru Hori
Affiliation: Department of Electronic and Electric Engineering, Nagoya University

Rationale: Prof. Hori has been leading the field of plasma science and technologies over 30 years. He is an outstanding plasma scientist putting his heart into the establishment of plasma science. It is so famous that he has always put forward the new concept of researches, founded out many new phenomena, clarified their mechanisms and eventually systematized them. Through the series of his experiences, his great skill, vision and a good eye enabled him to find out Plasma Activated Medium (PAM) killing cancers selectively. His life achievements especially to the plasma medicine consist of the finding PAM, the systematical diagnostics of gas and liquid phase, insights into the cell activity by the molecular biology and *in vivo* experiments with a good collaboration of medical doctors towards the establishment of Plasma Medical Science. It is consistent in his strong earnest to achieve the establishment of plasma sciences including the semiconductor, material processing field and plasma life fields, and his performances are extremely excellent with a high originality in many fields. Prof. Hori has 482 papers, 1587 presentations in international conferences (including about 252 invited talks, 44 plenary/keynote talks), 28 books, 21 awards and 95 registered patents in his lifetime achievements.

Talk Title: Challenge to the systematization of the biological interaction by plasmas

Short abstract: A Plasma-activated medium (PAM) has been proposed as a new drug, in other words, a non-equilibrium liquid drug for the cancer therapy. The PAM has exhibited strong antitumor effects on glioblastoma, ovarian, gastric, pancreatic, lung and breast cancers through in vitro and in vivo experiments. There is a universal phenomenon to a variety of cancer cells. Furthermore, it was found that PAM downregulated survival and proliferating signaling structures. Such interactions of plasma with liquid resulting in various kinds of biological reactions have been the recent greatest topics in Plasma Physics. There have been many researches focusing on systematical diagnostics of gas and liquid phase, insights into the cell activity by the molecular biology and *in vivo* experiments in this fields. Through these studies, in order to establish a plasma medical science as an interdisciplinary area, the systematization of new phenomena of intracellular molecular reactions in liquid induced by plasma, including the PAM is of crucial importance from viewpoints of plasma physics. Prof. Hori will overview studies made about this world topics in the past as an inventor of PAM and give a foresight into the future.

List of related published papers

1. S. Iseki, K. Nakamura, M. Hayashi, H. Tanaka, H. Kondo, H. Kajiyama, H. Kano, F. Kikkawa, M. Hori, Selective killing of ovarian cancer cells through induction of apoptosis by nonequilibrium atmospheric pressure plasma, Appl Phys Lett, 100 (2012) 113702.
2. F. Utsumi, H, Kajiyama, K. Nakamura, H. Tanaka, M. Mizuno, K. Ishikawa, H. Kondo, H. Kano, M. Hori, F. Kikkawa, Effect of Indirect Nonequilibrium Atmospjeric Pressure Plasma on Anti-Proliferative Activity against Chronic Chemo-Resistant Ovarian Cancer Cells In Vitro and In Vivo, Plos One, 8(2013) e81576.
3. H. Tanaka, K. Ishikawa, M. Mizuno, S. Toyokuni, H. Kajiyama, F. Kikkawa, H. Metelmann, M. Hori, State of the art in medical applications using non-thermal atmospheric pressure plasma, Rev. Mod. Plasma Phys. (1017) 1:3 DOI: 10.1007//s4161-017-0004-3.
4. H. Tanaka, K. Nakamura, M. Mizuno, K. Ishikawa, K. Takeda, H. Kajiyama, F. Utsumi, F. Kikkawa, M. Hori, Non-thermal atmospheric pressure plasma activated lactate in Ringer's solution for anti-tumor effects, Scientific Report (2016) 6:36282, DOI:10.1038/srep36282.