Abstract Submitted
for the GEC15 Meeting of
The American Physical Society

Soluble Proteins Form Film by the Treatment of Low Temperature Plasma[1] SANAE IKEHARA, Natl. Inst. of Adv. Ind. Sci. and Tech. (AIST), HAJIME SAKAKITA, Electronics and Phot. Res. Inst., AIST, KENJI ISHIKAWA, Graduate School of Engineering, Nagoya Univ., YOSHIHIRO AKIMOTO, Dept.of Anat. Kyorin Univ. school of med, HAYAO NAKANISHI, Aichi Cancer Cent. Hosp., NOBUYUKI SHIMIZU, SANNO Hosp., MASARU HORI, Graduate School of Engineering, Nagoya Univ., YUZURU IKEHARA, Biotech. Res. Inst.for Drug Disc., AIST — It has been pointed out that low temperature plasma in atmosphere was feasible to use for hemostasis without heat injury. Indeed, earlier studies demonstrated that low temperature plasma played an important role to stimulate platelets to aggregate and turned on the proteolytic activities of coagulation factors, resulting in the acceleration of the natural blood coagulation process. On the other hands, our developed equips could immediately form clots upon the contact with plasma flair, while the histological appearance was different from natural coagulation. Based on these findings in formed clots, we sought to determine if plasma flair supplied by our devices was capable of forming film using a series of soluble proteins Following plasma treatment, films were formed from bovine serum albumin, and the other plasma proteins at physiological concentration. Analysis of trans-electron microscope demonstrated that plasma treatment generated small protein particles and made them fuse to be larger aggregations The combined results demonstrated that plasma are capable of aggregating soluble proteins and that platelets and coagulation factors are not necessary for plasma induced blood coagulation.

[1]Supported in part by Grants-in-Aid for Scientific Research on Priority Area (21590454, 24590498, and 24108006 to Y. I.)

Yuzuru Ikehara
Biotechnology Research Institute for Drug Discovery,
National Institute of Advanced Industrial Science and Technology (AIST)

Date submitted: 16 Jun 2015 Electronic form version 1.4