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**Measurement of the diffusion coefficient of supported lipid bilayer irradiated with dielectric barrier discharge** YOSHIYUKI SUDA, RYUMA YAMASHITA, KOTA YUSA, TORU HARIGAI, HIROFUMI TAKIKAWA, Toyohashi University of Technology, AKINORI ODA, Chiba Institute of Technology, RYUGO TERO, Toyohashi University of Technology — We have focused on the behavior of artificial cell membrane system at solid-liquid interface. We irradiated the Ar or He gas dielectric barrier discharge (DBD) onto a supported lipid bilayer (SLB) [1-2]. Observation with a fluorescence microscope and atomic force microscope revealed the formation of pores on the order of 10 nm–1  $\mu$ m in size without a change in pH. We propose that SLBs are effective for obtaining information about the physical and chemical modification of cell membranes induced by plasma. SLB was produced in buffer solution on the SiO<sub>2</sub> / Si substrate using the vesicle fusion method. DOPC (dioleoylphosphatidylcholine) and Rb-DOPE (rhodamine B-dioleoylphosphatidylethanolamine) were used as a lipid and fluorescent dye-labeled lipid, respectively. The diffusion coefficients of the SLBs before and after the He gas DBD irradiation were measured using a confocal laser scanning microscopy. It was found that the diffusion coefficient became 30% lower after the DBD irradiation.

[1] Ryugo Tero, Yoshiyuki Suda, Ryo Kato, Hideto Tanoue, and Hirofumi Takikawa: Appl. Phys. Exp. **7** (2014) 077001 (4 pages);

[2] Yoshiyuki Suda, Akinori Oda, Ryo Kato, Ryuma Yamashita, Hideto Tanoue, Hirofumi Takikawa, and Ryugo Tero: Jpn. J. Appl. Phys. **54** (2015) 01AF03 (6 pages).

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