**Abstract submission form**

**(Poster presentation)**

|  |  |
| --- | --- |
| Name | Kazuhiko ISHIHARA |
| Department | Department of Materials Engineering |
| Institution | The University of Tokyo |
| Country | Japan |
| E-mail | [ishihara@mpc.t.u-tokyo.ac.jp](mailto:ishihara@mpc.t.u-tokyo.ac.jp) |
| Phone number | +81358417124 |
| Abstract | Within 280 words |

Please send your abstract to ICBZM2017 secretariat office until July 1st, 2017. ([icbzm2017@mpc.t.u-tokyo.ac.jp](mailto:icbzm2017@mpc.t.u-tokyo.ac.jp))

**Photochemical Preparation of Phosphorylcholine Group Immobilized-Polymer Surface**

Kazuhiko Ishihara

The University of Tokyo

Polymers with phosphorylcholine group, for example, 2-methacryloyloxyethyl phosphorylcholine (MPC) polymers, provide an excellent biocompatible surfaces. In general, the surfaces are prepared by coating of the polymer, reacting with polymer and grafting the polymer. We have developed new photochemical reaction at the surface of super-engineering plastic to initiate graft polymerization even under aqueous medium [Kyomoto M, Ishihara K. ACS Appl Mater Interfeces 2009, 1(3) 537-542]. When irradiation with UV light is carried out on the poly(ether-ether-ketone) (PEEK), radicals are form at the surface. The monomers surrounding the surface can polymerize during this process. That is, benzophenone units in the main chain of PEEK activated by UV irradiation. To obtain new biomaterials, we prepared poly(MPC)-graft PEEK by self-initiated surface graft polymerization. Around 120 nm in thickness poly(MPC) graft layer was generated by 60 min-irradiation at 60°C. This poly(MPC) layer has good resistance of protein adsorption and cell adhesion as reported and also excellent lubrication on the surface. Dynamic friction coefficient of poly(MPC)-graft PEEK was about 0.01 under 20 MPa loading. It is 0.02 in case of natural cartilage. To enhance polymerization process of MPC, we considered that the effects of inorganic salt in the reaction medium. When NaCl in 2.5mol/L was added in the MPC solution and graft polymerization was carried out, only 5-min irradiation at 25 °C was enough to have 100 nm-graft layer of poly(MPC). That is due to increase in apparent concentration of MPC in an aqueous medium. We are now evaluating performance of this poly(MPC)-graft PEEK as an artificial joint and artificial valve based on easy fabrication process of PEEK.

This research was supported financially by S-innovation project from JST and Japan Agency for Medical Research and Development.

**Abstract within 280 words**