

# World Drug Delivery Summit

August 17-19, 2015 Houston, USA

## Pharmaceutical evaluation of nano-fiber matrix supported drug delivery system using solvent-based electrospinning method

**Nobuhito Shibata**

Doshisha Women's College of Liberal Arts, Japan

The solvent-based Electrospinning (ES) method is mainly employed in the textile industry to make nano-fiber from polymers. Utilizing this method, nano-fiber matrix supported controlled-release systems of drugs were prepared and evaluated, where, methacrylic acid copolymer (EUDRAGIT® S100, MCA) was used as a base polymer. Using the ES apparatus equipped with a high-voltage supplier, syringe pump and a metallic collection plate for nano-fiber, the polymer solution including drug (hydrophilic or hydrophobic) was extracted into a glass syringe with a stainless steel needle (18 gauge), and the syringe was fixed at a designated position in the ES apparatus. The voltage applied between the needle and the metallic collection plate was 25 kV with a collection distance of 10 cm. The polymer solution including the drug was then pushed out at a constant flow rate. Consequently, a nano-fiber was formed from the stream of polymer solution in the electric field, and a self-assembled nano-fiber sheet was obtained on the metallic collection plate. The X-ray diffraction for the nano-fiber sheet showed that drugs were packed into nano-fiber in amorphous form. Then, the nano-fiber sheet including drug was applied for several drug delivery systems as a nano-fiber matrix. *In vitro* release profiles and *in vivo* pharmacokinetic profiles of drugs from the formulation including nano-fiber matrix in rats and/or mice showed the aspects of controlled-release system as compared to conventional preparations. Moreover, the nano-fiber matrix is applicable for both hydrophilic and hydrophobic drugs, and provides new approaches to prepare several formulations with pharmaceutical advantages.

### Biography

Nobuhito Shibata finished his Master's degree course of clinical pharmacy at Kyoto Pharmaceutical University in 1986. He, then, worked for Shiga University of Medical Science for 13 years as a Hospital Pharmacist. During this period, he got a PhD degree (Pharmaceutical Sciences) from Kyoto Pharmaceutical University. Subsequently, he changed his career and worked for Kyoto Pharmaceutical University for 6 years as an Associate Professor in the field of pharmacokinetics. In 2005, he was transferred to a higher post at Doshisha Women's College of Liberal Arts as a Professor of Faculty of Pharmaceutical Science. His research interests focus on the constructing drug delivery system using nano-particles.

[nshibata@dwc.doshisha.ac.jp](mailto:nshibata@dwc.doshisha.ac.jp)

### Notes: