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## CELLULOSE BASED SMART MATERIALS FOR FUTURE TECHNOLOGY

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Renewable materials maintain our resources from the environment, which we can overcome degradation of natural environmental services and diminished productivity. Cellulose is one of the nature's most abundant natural polymers, the main chemical components of wood and plants. It is a renewable material that recycles to nature by composting with short period of time. The use of renewable materials is essential in future technologies. This presentation reviews recent advancement of cellulose for smart materials, including cellulose and its sensors, actuators, energy storage and space structure applications. To further improve functionality of renewable materials, hybrid composites of inorganic functional materials are introduced by incorporating carbon nanotubes, titanium dioxide and tin oxide conducting polymers and ionic liquids. Since renewable materials have many advantages of biocompatible, sustainable, biodegradable, high mechanical strength and versatile modification behaviours, more research efforts are necessary on the development of renewable smart materials.

### Biography

Jaehwan Kim has joined the Department of Mechanical Engineering at Inha University, Korea in 1996, where he served as Inha Fellow Professor. He is a fellow of The Korean Academy of Science and Technology, National Academy of Engineering of Korea, and Institute of Physics. He is an Associate Editor of *Smart Materials and Structure* and Editor of *International Journal of Precision Manufacturing and Engineering*. He has been the Director of Creative Research Center for EAPap actuator funded by National Research Foundation of Korea (NRF). Recently, he started another Creative Research Center for nanocellulose future composites, sponsored by NRF. He has first discovered cellulose as a smart material, which can be used for sensors, actuators and electronic materials. His research interests include smart materials, structures and devices, renewable smart materials, cellulose, electroactive polymers, power harvesting and flexible electronics. He has published more than 270 prestigious journal papers, 310 international conference papers, more than 40 patents.

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