

### Study on Biocompatibility of Functionalized ZnO Nanowire Toward Single Cell Monitoring

Deepti Sharma, Rizwan Khan, 김진태, 구아영, 서지혜,  
송정근, 육영근, 임연호\*  
전북대학교

We present direct interconnection of the cells to the external world by interfacing ZnO nanowires (NWs) across the membranes, and between neighboring cells. For this, the direct interface of three types of ZnO NWs i.e pristine, polymer-like amorphous carbon (PAC) core-shell NWs and amino group terminated PAC NWs with normal THLE-3 cell lines and hepatocellular cancerous HLK-2 cells have been demonstrated without any external force. The MTT assay results showed that the amino group terminated ZnO/PAC NWs are completely biocompatible and bio-safe after interfacing with the cells. The amino group terminated ZnO/PAC NWs were found to provide less stressful environment to the mammalian cells culture and were considered to be more compatible for further applications in in vivo biomedical science and engineering. Finally, the bio-functionalized ZnO/PAC NWs also showed successful interfacing without inducing any significant toxicity and stress into the mammalian cell lines. These preliminary experiment results showed that the surface modified ZnO NWs can provide novel platform for single cell monitoring.