Electronic Supplementary Material (ESI) for Toxicology Research.

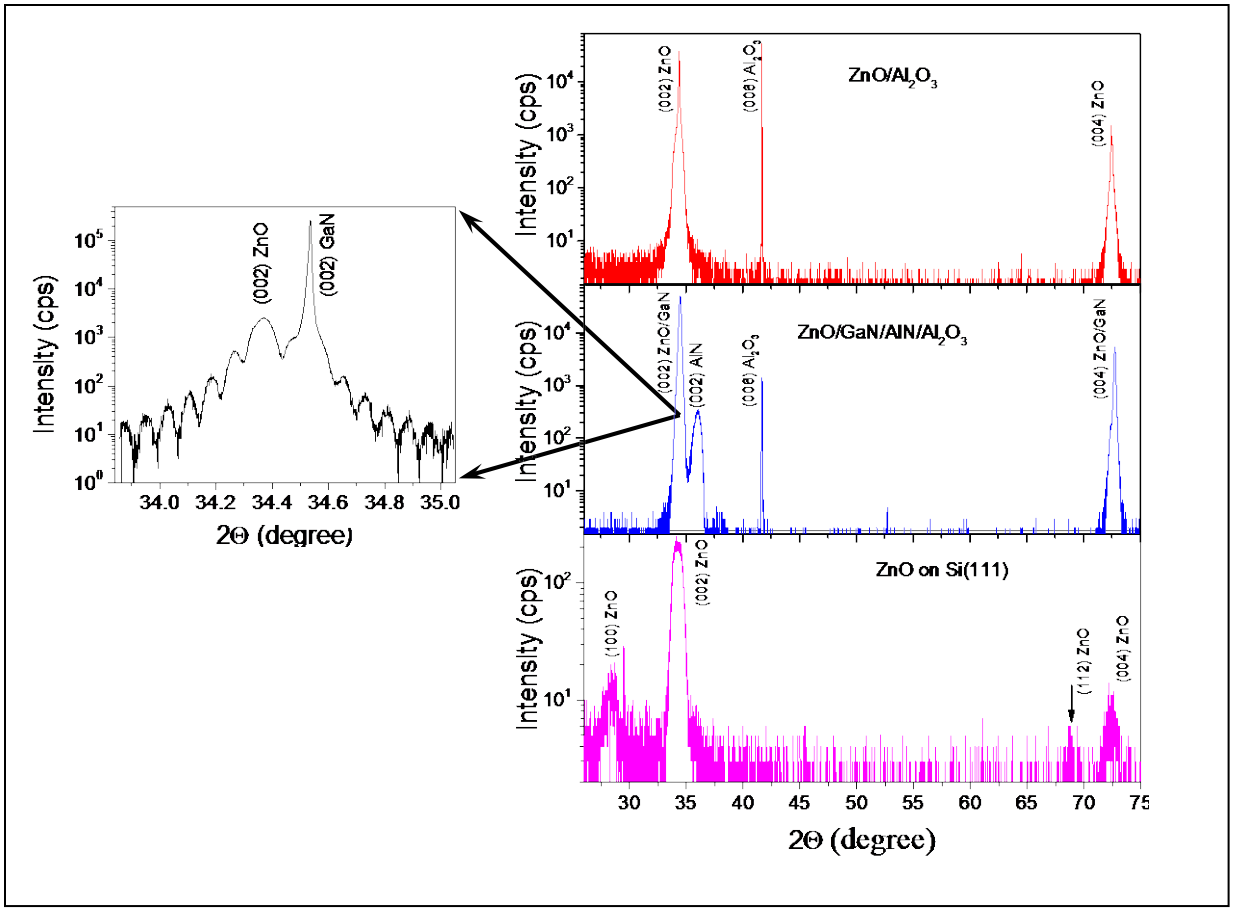

Figure S1. Double-crystal x-ray diffraction (XRD) scans from ZnO films grown on c-plane sapphire (top panel), GaN templates prepared by metal-organic chemical vapor deposition on sapphire using AlN buffer (central panel), Si(111) substrates (bottom panel). XRD pattern from ZnO on sapphire shows only (002) and (004) ZnO reflection and (006) sapphire peak that it is consistent with epitaxial nature of the ZnO films. The scan for ZnO/GaN structures also shows only (002) and (004) ZnO/GaN peaks and (002) reflection from AlN nucleation layer. It should be noted that the resolution of ZnO diffraction peaks cannot be resolved on the double-crystal scan from the structure grown on GaN template; because it is obscured by very strong reflections of GaN having the same wurtzite structure and similar lattice parameters (c lattice parameters are 0.521 and 0.519 nm for ZnO and GaN, respectively). Therefore, we have performed an additional high-resolution, triple axis scan in a narrow angular range around (002) ZnO and (002) GaN reflections (left panel) which clearly showed (002) reflection from ZnO peak at ~34.4°. As seen from the figure, the pattern is featured by strong thickness fringes indicating high structural perfection of ZnO film and a sharp interface between ZnO and GaN. Diffraction pattern from ZnO on (111) Si shows several weak and broad diffraction lines around 28°, 34 °, 68 °, and 72.5 ° consistent with (100), (002), (112), (004) reflections, respectively. Poor crystallinity of ZnO on Si is a consequence of low growth temperature (200 °C), ~450 °C lower compared to the growth temperature for ZnO on sapphire and GaN templates. Reflections from Si(111) substrates are not seen in the scan because of misalignment on the ZnO film and the substrate. The alignment during XRD measurements was performed for ZnO reflections to maximize the signal.