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CHALLENGES IN NANOBIOMATERIAL TOXICOLOGY ASSESSMENT

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SUMMARY

To understand the 'nano safety' issues is not that easy and especially for those scientists from non-biomedical sciences who aggressively work on nano research activities. Furthermore, this issue becomes more complicated once it gets into industrial level. Therefore, it is important that the knowledge of nano safety should be transferred accordingly to the scientists who work on nano-biomaterial and they can practice it in their research investigation. *In-vitro* cytotoxicity safety assessments on nanobiomaterial are not enough and not conclusive because the data gained do not reflect the actual condition. It is worse when the researcher tries to investigate the safety issues by following the 'ISO' protocols, e.g. Cells Cytotoxicity Assays (MTT or MTA) and use the "unmatched" cells for their nano-biomaterial studies. In the real environment once the nanomaterial has been introduced into human body either in targeted tissues or randomly in the blood - pathway, the nanobiomaterial will not stay in one particular area of the tissues or expose to only one specific cell. It might migrate to the whole system and will act according to its susceptibility condition to the cells and tissues. Therefore, to elucidate the actual function of the biomaterial, *in-vivo* models which mimic the actual pathologic condition will be the best model. They need a good design of the experimental protocol which data gained from this model will help towards clinical used prior to commercializing it.