

Towards the Development of Advanced Nanomedicine by new Biomaterials

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As the third surgical therapy following the reconstruction surgery and organ transplantation, a new therapeutic trial based on the natural potential of tissue regeneration induction has been expected. However, only by using such cells, it is practically difficult to induce tissue regeneration. This is because basically, cells survive and biologically function interacting with their local surrounding environment which has been demonstrated to be comprised from growth factors and extracellular matrix. In this case, the combination with cells and/or growth factors is required. One practically possible way to enhance the *in vivo* activities expected is to make use of drug delivery system (DDS). We have prepared biodegradable nanoparticles for the controlled release of bioactive growth factors to demonstrate the successful regeneration repairing of various tissues. This release system can be combined with cells and/or the cell scaffold to induce the regeneration repairing of tissues and organs. This presentation overviews our several experimental data of tissue regeneration on the basis of nano-biomaterials and DDS technology.