

The collaboration research for the Dual Graduate School between VNU and JAIST

[Title of collaboration research]:

Design of Supramolecular Biomaterials for Advanced Medicines

[The members of collaboration research]:

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[Reference home-page address]: <http://www.jaist.ac.jp/ms/labs/yui/english/index.html>

[Other references]:

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Supramolecular approach in our laboratory at JAIST has emerged to exploit new design of biomaterials for advanced medical applications such as gene delivery and tissue regeneration. One of the fascinating properties of supramolecular-structured polymers as biomaterials is the mobility of ligand-conjugated cyclic compounds which are threaded onto a linear polymeric chain in polyrotaxanes. We found that the mobility of biological ligands in the polyrotaxanes contributes much to enhancing multivalent interaction with the binding sites of biological receptors. This unique property is now applied for the novel design of artificial gene carrier which can deliver DNA to the nucleus of target cells with high transfection efficiency and low cytotoxicity. Moreover, supramolecular dissociation triggered by terminal cleavage can lead to effective DNA release into nucleus. More detailed characterization of supramolecular mobility seen in such polyrotaxanes would be one of the collaboration themes with VNU.

