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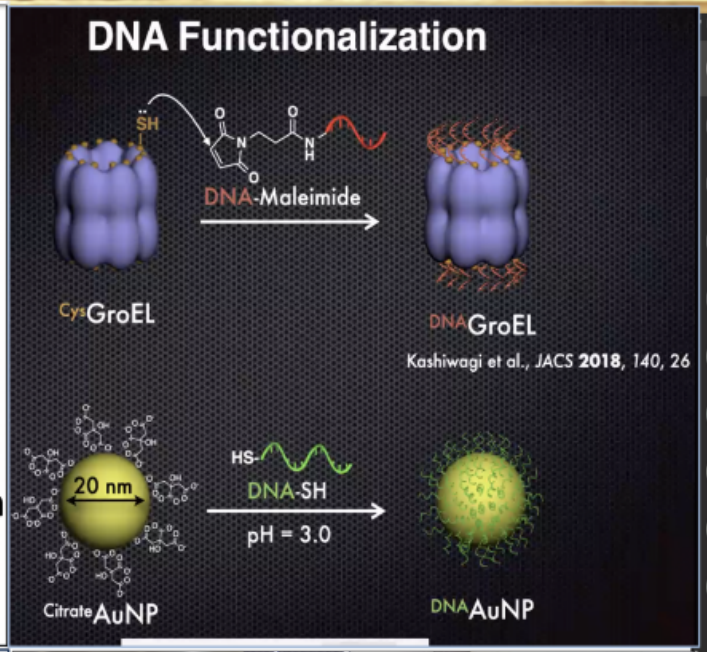

DAILAB-CAFE

Series - 61

Date & Time: April 21, 2021 (15:30–16:30 JST)
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Supramolecular Chemistry for Bio-applications: Responsive Nanocarriers for RNA Delivery

In this talk, I am hoping to introduce novel designs based on supramolecular chemistry (non-covalent interaction between molecules), which could be used as 'nanocarriers' for RNA delivery. Small molecule-based drugs (e. g. paracetamol for painkiller, doxorubicin for chemotherapy etc.) cure many of the diseases, however, only less than 20% of the diseases are 'druggable' by small-molecule drugs. An alternate approach is to use gene or protein as a therapeutic drug, which in principle can cure any diseases including cancers. One crucial problem with the gene- or protein-based drug is its instability in the bloodstream, where the drug mostly cleaved by enzymes or proteases before reaching the diseased site. Hence, nanocarriers that can 'carry' a drug from outside the body into the diseased site are necessary to achieve an effective therapeutic benefit. Important points to be considered are; the drugs should be non-covalently encapsulated into the 'carrier', should protect in the bloodstream and deliver the drug at the diseased site by a stimulus. I will introduce some of our nanomedicine formulations developed for RNA delivery (1) a 'template polymerization' approach to encapsulate a small interfering RNA (a therapeutic gene fragment) in a polymer 'nanocaplet', (2) a Protein-based nanotube consisting of an array of RNA at its interior and (3) a porous architecture based on a three-component system (chaperonin protein, DNA and nanoparticle).

90

PARTICIPANTS

THANK YOU FOR YOUR PARTICIPATION!