

# Life Sciences Seminar

## "Plant-derived nanoparticles: intrinsic properties and biotechnological applications"

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An intrinsic property of animal cells is to adopt a sophisticated mechanism to communicate each other based on small lipoproteic nanocarriers (30-100 nm), called exosomes, released in the extracellular space. Exosomes have recently received great attention due to their ability to be specialized intercellular shuttle. It has been widely described that these vesicles contain nucleic acids, lipids and proteins and that they can deliver these molecules among cells, thus affecting target cell phenotype. Furthermore, a growing interest is focused on the possibility to use these nanovesicles as therapeutic carriers for compounds and nucleic acids that result unstable in the *in vivo* environment. Exosome molecular and physical properties give the opportunity to engineer them in order to modify (i) content, through the introduction of siRNAs, shRNAs and drugs, and/or (ii) tropism in order to target them to specific cell/tissue/organ. Recently we have generated targeted exosomes able to deliver Imatinib or BCR-ABL siRNA to Chronic Myeloid Leukemia, *in vitro* as well as in *in vivo* animal model, thus overcoming pharmacological resistance.

Although promising, many challenges in the clinic use of exosomes exist, also because of their low recovery. The use of plant-derived nanoparticles has been suggested as a feasible strategy for *in vivo* drug delivery. Edible plant nanovesicles are exosome-like structures identified in several vegetables. Very recent data attributed to them curative characteristics depending on the plant species. We identified these small vesicles in Citrus lemon juice and we have tested their anti-cancer and anti-inflammatory properties. Our future researches is aimed at defining a strategy to load drugs and/or nucleic acid in plant-derived nanovesicles for enhancing their therapeutic efficacy.

- **Date: 14:00 PM/Dec. 11(Tue.)/2018**
- **Place: Auditorium(1F), POSTECH Biotech Center**
- **Inquiry: Prof. Yong Song Gho (279-2345)**

**\* This seminar will be given in English.**

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