Joon Myong Song, Ph.D.

Professor

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Education

- Ph.D. Kyushu Univ. (1997)
- M.S. Sogang Univ. (1993)
- B.S. Sogang Univ. (1991)

Work Experiences

- 2000 - 2001: Brookhaven National Lab. Research Associate
- 2001 - 2004: Oak Ridge National Lab. Research Associate
- 2004 - 2005: CNU, Assistant Professor
- 2005 - present: SNU, Professor

Social Activities

- Ajou Outstanding Publication Award (2011)

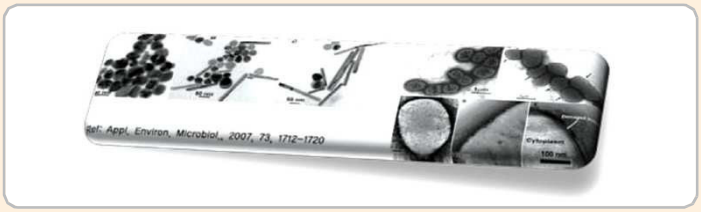
Selected Publications

- High-content quantum dot-based subtype diagnosis and classification of breast cancer patients using hypermulticolor quantitative single cell imaging cytometry, Nano Today (2012)
- Synthesis of Highly Antibacterial Nanocrystalline Trivalent Silver Polydiguanide, J. Am. Chem. Soc. (2009)
- Early Stage High-content HIV Diagnosis Based on Concurrent Monitoring of Actin Cytoskeleton, CD3, CD4, and CD8, Anal. Chem. (2013)
- Real-time concurrent monitoring of apoptosis, cytosolic calcium, and mitochondria permeability transition for hypermulticolor high-content screening of drug-induced mitochondrial dysfunction-mediated hepatotoxicity, Toxicol. Lett. (2012)
- Simultaneous quantitative monitoring of drug-induced caspasecascade pathways in carcinomacells, Integr. Biol. (2010)
- Metallopharmaceuticals based on silver(I) and silver(II) polydiguanide complexes: activity against burn wound pathogens, J. Antimicrob. Chemother. (2010)
- Does antibacterial activity of silver nanoparticle depend on shape of nanoparticle? A study on Gram-negative E. coli, A ppl. Environ. Microbiol. (2007)

Nanomedicinal Labortary

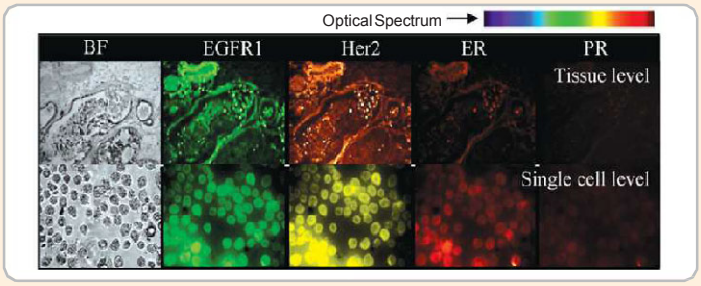
Multifunctional nanoparticlefor diagnosis and therapy

Recently nanoparticle-based optical constrast agents are used for drug screening based on optical imaging. Quantum dot, gold and silica nanoparticles are highly sensitive, photostable, non-invasive, and non-ionizing. They are capable of being biocompatible and selectively delivered to specific target molecules by surface functionalization, and this leads to their effective use for cancer diagnosis and relevant anticancer drug screening. The optical contrast agents have intrinsic therapeutic property or can be conjugated to therapeutic agents. This allows for the optical contrast agents to be used as multifunctional agents that enable both diagnosis and therapy simultaneously. My research is to explore novel syntheses of multifunctional nanoparticlesandapplythemtobiomedical field.



High-content cell-baseddrug screening

Our current research aims to develop novel cell-based drug screening system that can be coupled with biological assays for high-throughput/high-content drug screening. To achieve this goal, we have recently reported the development of a quantitative hyperspectral cellular imaging system based on uniform threshold intensity distribution (TID). This system provides hypermulticolor single cellular imaging to allow simultaneous monitoring of intracellular drug-induced multitarget activation/inactivation. Multiple probing materials such as fluorescent nanoparticle are used to be bound to drug targets. This approach enables simultaneous monitoring of drug-induced on/off target effect as well as side effect with one-step cellularassay.



Antidiabetic Drug

Our research focuses on development of novel metal based drug for antihyperglycemic activity. In the field of metallodrugs, particular metals such as vanadium and zinc have been well known for their antidiabetic character. Therefore we synthesize various metal complexes using biological active ligands. This approach would help us in designing drug molecules with the enhanced insulin- mimetic activity, lipophilicity, membrane transport and bioavailability. Our prime concern is to reduce the drug toxicity and increases the water-solubility nature for the development oforal drugs.