

# NANO KOREA 2020

## July 1~3, KINTEX, Korea

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### Seok-Joon Kwon

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#### **EDUCATION**

Korea Advanced Institute of Science and Technology (KAIST)	Ph.D	Biological Sciences	<b>1998</b>
KAIST	MS	Biotechnology	<b>1994</b>
Yonsei University, Seoul, Korea	BS	Food Engineering	<b>1992</b>

#### **PROFESSIONAL ACTIVITIES**

- Sr. Research Scientist (PI), Department of Chemical & Biological Engineering, RPI, USA (July 2013 to Present.)
- Postdoctoral fellow, Dept. Chem. Biol. Eng., RPI, USA (Dec. 2004 to June 2013)
- Postdoctoral fellow, Dept. Surgery., University of Pittsburgh Medical Center, USA (Dec. 2004 to Nov. 2005)
- Postdoctoral fellow, Dept. Biochemistry., Univ. of Minnesota, USA (Mar. 2002 to Nov. 2004)
- Senior Research Scientist, Genofocus, Republic of Korea (Jan. 2001 to Feb. 2002)
- Postdoctoral fellow, KRIBB, Republic of Korea (Mar. 1998 to Dec. 2000)

#### **AWARD AND HONORS**

- NIH Grant Award, collaboration with Mt. Sinai school of medicine (2019-2022)
- Sponsored Research Grant Award, collaboration with MBD Co. Ltd (12/01/2017 – Present)
- Global Research Lab Program Award from National Research Foundation of Korea (08/01/2014-07/31/2020)
- Phase II National Institute of Health (NIH)-Small business technology transfer (STTR) Grant award (02/01/2012 – 01/31/2014)
- Phase I National Institute of Health (NIH)-Small business technology transfer (STTR) Grant award (02/01/2010 – 01/31/2011)
- KASBP-Hanmi and KASBP-Yuhan Fellowship Awards (2017)
- “People glorifying Korea”, Biological Research Information Center (BRIC) in Korea (2012) (2014) (2016) (2019)
- Research Fellowship Award, Korea Science and Engineering Foundation (KOSEF) (1998-2000)
- The American Oil Chemists’ Society (AOCS) Award in U.S.A. (1996/97)
- Best thesis award in KAIST (1994)
- Oh-Woon Scholarship (KOLON Inc.) in Korea (1990-1992)

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### MAIN SCIENTIFIC PUBLICATION

- Kwon, P. S., Ren, S., Kwon, S. J. (Co-First Author), Kizer, M. E., Kuo, L., Zhou, F., Zhang, F., Kim, D., Fraser, K., Kramer, L. D., Seeman, N., Dordick, J. S., Linhardt, R. J., Chao, J., & Wang, X. (2020) Designer DNA architecture offers precise and multivalent spatial pattern-recognition for viral sensing and inhibition. *Nat. Chem.* 12(1):26-35. – Cover story
- Kim D., Kwon S. J. (Co-First Author), Wu X, Sauve J., Lee I., Nam J., Kim J., Dordick J. S. (2018) Selective Killing of Pathogenic Bacteria by Antimicrobial Silver Nanoparticle - Cell Wall Binding Domain (CBD) Conjugates. *ACS Appl Mater Interfaces.* 10:13317-13324.
- Kwon, S. J., Na, D. H., Kwak, J. H., Douaisi, M., Zhang, F., Park, E. J., Park, J. H., Youn, H., Song, C. S., Kane, R. S., Dordick, J. S., Lee, K. B., Linhardt, R. J. (2017) Nanostructured glycan architecture inhibits influenza A virus infection. *Nat. Nanotechnol.* 12:48-54
- Kwon, S. J., Lee, D. W., Shah, D. A., Ku, B., Jeon, S. Y., Solanki, K., Ryan, J. D., Clark, D. S., Dordick, J. S., Lee, M. Y. (2014) High-Throughput and Combinatorial Gene Expression on a Chip for Metabolism-Induced Toxicology Screening. *Nat. Commun.* 5:3739
- Kwon, S. J., Lee, K. B., Solakyildirim, K., Masuko, S., Ly, M., Zhang, F., Li, L., Dordick, J. S., Linhardt, R. J. (2012) Signal Amplification by Glyco-qPCR for Ultrasensitive Detection of Carbohydrates: Applications in Glycobiology. *Angew. Chem. Int. Ed.* 51: 11800-4
- Shah, D. A., Kwon, S. J. (Co-First Author), Bale, S. S., Banerjee, A., Dordick, J. S., Kane, R. S. (2011) Regulation of Stem Cell Signaling by Nanoparticle-Mediated Intracellular Protein Delivery. *Biomaterials* 32:3210-9.
- Bale, S. S., Kwon, S. J., Shah, D., Kane, R. S., Dordick, J. S. (2010) Nanoparticle mediated cytoplasmic delivery of proteins to mammalian cells. *ACS Nano* 4:1493-500.
- Kwon, S. J., Lee, M. Y., Ku, B., Sherman, D. H., Dordick, J. S. (2007) In vitro metabolic pathway engineering for natural product drug discovery. *ACS Chem. Biol.* 2:419-25
- Kwon, S. J., Song, J. J., Lee, Y. J., (2005) Signal Pathway of HIF-1alpha Phosphorylation And Its Interaction With pVHL in MiaPaCa-2 Pancreatic Cancer Cells During Ischemia. *Clin. Cancer Res.* 11: 7607-7613
- Kwon, S. J., Lee, Y. J. (2005) Effect of Low Glutamine/Glucose on Hypoxia-induced Elevation of HIF-1alpha in Human Pancreatic Cancer MiaPaCa-2 and Human Prostatic Cancer DU-145 Cells. *Clin. Cancer Res.* 11: 4694-4700
- Kwon, S. J., de Boer, A. L., Petri, R., Schmidt-Dannert, C. (2003) High-level production of porphyrins in metabolically engineered Escherichia coli: systematic extension of a pathway assembled from overexpressed genes involved in heme biosynthesis. *Appl. Environ. Microbiol.* 69: 4875-4883

### RESEARCH INTERESTS

- CRISPR-based biosensor design
- DNA nanotechnology for drug delivery, biosensing, protein/gene delivery, and bioimaging
- Multivalent inhibitor design for combating infectious diseases and cancer
- Cell-based bioassay design for high-throughput and high-content screening of drug candidates.
- Metabolic engineering and synthetic biology
- Protein engineering (rational design, directed evolution, and surface display)