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Post-Doctoral Fellow
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Nationality: South Korea
Field: Organic Chemistry, Biochemistry, DNA Chemistry, Bio-medical Chemistry

## Research Topic

1. Organic synthesis for biological application
2. DNA chemistry for genetic and structural sensor
3. Fluorescence and optical technique for DNA structural probing and live-cell imaging
4. Drug Delivery System (DDS) using bio- and nano-materials

## Highlights of qualification

· Extensive knowledge and experience in synthesis of oligonucleotide and their chemical modification.
· Proficient in areas of organic synthesis: nucleoside and phosphoramidite chemistry.
· Highly motivated, teamwork and capable of doing both independent and collaborative research.
· Proficient in synthetic and analytical techniques, instrumentation and interpretation of data.
· Working knowledge with most of the chemical databases and scientific software applications like MS Word, PowerPoint, Excel, Origin, ChemDraw, Sci-Finder, Photoshop.

## Education

· Integrated course of M.S. and Ph.D.: 2006.03 - 2012.02; Organic Chemistry, Pohang University of Science and Technology (POSTECH), Pohang, S. Korea
· B.S.: 2002.03 - 2006.02; Chemistry, Sogang University, Seoul, S. Korea

## Professional Experiences

· Teaching Assistant: 2006.03 - 2007.02; General Chemistry Experiment, POSTECH, Pohang, S. Korea
· Research Assistant: 2007.03 - 2012.02; POSTECH, Pohang, S. Korea
· Manager: 2012.04 - 2013.06; Advanced battery research group, LG Chem, Daejeon, S. Korea
· Postdoctoral fellow, 2013.08 - Present; KAUST, Thuwal, Kingdom of Saudi Arabia

## Research Experiences

· Synthesis and photophysical study of fluorescent oligodeoxynucleotides (DNA)
· Synthesis of modified oligonucleotides and siRNA
· Synthesis of modified phosphoramidites of fluorophores
· Interested in DNA quadruplex structures (G-quadruplex and i-motif)
· Synthesis of hydrophilic magnetic nanoparticle

## Analytical techniques

· Spectroscopy: Acquisition and analysis of 1D (1H, 13C, 31P, 19F) NMR, IR, UV, Fluorescence, Circular Dichroism
· Spectrometry: Acquisition and analysis of MALDI-TOF MS and analysis ESI-MS and FAB HRMS
· Chromatography: Experienced in flash chromatography, preparative and analytic HPLC
· Microscopy: Confocal Laser Scanning Microscopy (CLSM), Transmission Electron Microscopy (TEM)
· Others: Experienced in oligonucleotide synthesizer, Gel Electrophoresis (PAGE)

## Conference Presentations

1. I. J. Lee, Y. J. Seo and B. H. Kim, "Fluorescent Oligonucleotide Probes Bearing Pyrene-labeled Bases", 99th Annual Meeting (Korean Chemical Society), Goyang, Korea, 2007. 4. (Poster presentation)
2. I. J. Lee, J. W. Yi and B. H. Kim, "Probing the Diverse DNA Structures Using the Fluorescent Nucleoside System", 7th Organic Workshop of Korean Chemical Society, Mallipo, Korea, 2007. 8. (Poster presentation)
3. I. J. Lee, Y. J. Seo and B. H. Kim, "Probing the Diverse DNA Structures Using the Fluorescent Nucleoside System", 17th International Conference on Organic Synthesis (IUPAC), Daejeon, Korea, 2008.6. (Poster presentation)
4. I. J. Lee and B. H. Kim, "Probing the Diverse DNA Structures using the Fluorescent Nucleoside System", 101th Annual Meeting (Korean Chemical Society), Seoul, Korea, 2008. 4. (Poster presentation)
5. I. J. Lee and B. H. Kim, "Probing the Diverse DNA Structures using the Fluorescent Nucleoside System", Tohoku University Global Center of Excellence Program Summer School, Sendai, Japan, 2008. 8. (Invited oral presentation)
6. I. J. Lee and B. H. Kim, "Probing the Diverse DNA Structures Using the Fluorescent Nucleoside System", The Second ChemComm International Symposium, Pohang, Korea, 2008.11. (Poster presentation)
7. I. J. Lee, J. W. Yi and B. H. Kim, "Probing the diverse DNA structures using end-stacking ability", 4th Nucleic Acid Chemical Biology (NACB) PhD Summer School, Odense, Denmark, 2009. 6. (Oral presentation)
8. I. J. Lee and B. H. Kim, "Probes for diverse DNA structures using end-stacking, and their applications", 105th Annual Meeting (Korean Chemical Society), Seoul, Korea, 2010. 4. (Oral presentation)
9. I. J. Lee and B. H. Kim, "Probing Systems for Telomeric DNA Structures using End-Stacking Ability", 29th International Roundtable on Nucleosides, Nucleotides and Nucleic Acids (IRT 2010), Lyon, France, 2010, 9. (Poster presentation)
10. I. J. Lee and B. H. Kim, "Fluorescent Probes for Quadruplex DNA Structures", 7th Organic Workshop of Korean Chemical Society, Gyeongju, Korea, 2011. 8. (Poster presentation)

## Publications

1. Y. J. Seo, I. J. Lee, J. W. Yi and B. H. Kim, "Probing the Stable G-Quadruplex Transition Using Quencher-Free End-Stacking Ethynyl Pyrene-Adenosine", *Chem. Commun.*, **2007**, 2817 (Highlighted in *Heart Cut*, Officical Web Site of American Chemical Society, *IF: 6.378*).
2. Y. J. Seo, I. J. Lee and B. H. Kim, "Detection of Structure-switching in G-quadruplexes Using End-Stacking Ability", *Bioorg. Med. Chem. Lett.*, **2008**, *18*, 3910 (*IF: 2.338*).
3. Y. J. Seo, I. J. Lee and B. H. Kim, "Homoadenine Signalling System for SNP Typing", *Mol. BioSyst.*, **2009**, *5*, 235 (*IF: 3.35*).
4. I. J. Lee, J. W. Yi and B. H. Kim, "Probe for i-motif structure and G-rich strand using end-stacking ability", *Chem. Commun.*, **2009**, 5383 (*IF: 6.378*).
5. J. W. Yi, J. Park, N. J. Singh, I. J. Lee , K. S. Kim and B. H. Kim, "Quencher-free molecular beacon: Enhancement of the signal-to-background ratio with graphene oxide", *Bioorg. Med. Chem. Lett.*, **2011**, *21*, 704 (*IF: 2.338*).
6. I. J. Lee, M. Park, T. Joo and B. H. Kim, "Using fluorescence changes of $^{Fl}$U units at terminal and mid-loop positions to probe i-motif structures", *Mol. BioSyst.*, **2012**, *8*, 486 (*IF: 3.35*).
7. I. J. Lee and B. H. Kim, "Monitoring i-motif transitions through the exciplex emission of a fluorescent probe incorporating two $^{Py}$A units", *Chem. Commun.*, **2012**, *48*, 2074 (Selected as an inside cover, *IF: 6.378*).
8. I. J. Lee*, M. Kim*, M. Ree and B. H. Kim, "Concentration dependent structure changes of human natural and pyrene-modified i-motif DNA", *Manuscript Submitted* (* Contributed equally).
9. I. J. Lee, J. W. Yi, Y. J. Seo and B. H. Kim, "Dual sensing system for potassium and mercury ions depending on dual structure formation", *Manuscript Submitted*.
10. I. J. Lee and B. H. Kim, "Labeling Oligonucleotides toward the Biomedical Probe", in Medicinal Chemistry of Nucleic Acids, L. –H. Zhang, Z. Xi, J. Chattopadhyaya Eds., Hoboken, NJ, Wiley, **2011**, pp 292-334 (Book chapter).