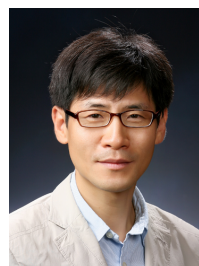

Asia 3 Roundtable on Nucleic Acids 2024

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2008 - Present Professor, Sungkyunkwan University School of Medicine

2000-2008 Assistant & Associate Professor, Sungkyunkwan University School of Medicine

1998-2000 Assistant Professor, Gyeongsang National University

1994-1998 Postdoctoral Fellow, University of California, Berkeley

1994 PhD Seoul National University, Seoul, Korea

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Research Interests:

Structural Biology, Chemical Biology & Biochemistry

- 1) Noncanonical DNA
- 2) Antimicrobial Resistance
- 3) Deubiquitinating Enzymes
- 4) Chemical-Based Cell Fate Change

Selected Publications:

1. Molecular basis for SOX2-dependent regulation of super-enhancer activity. **Nucleic Acids Res.** 2023 Nov 1;gkad908. doi: 10.1093/nar/gkad908.
2. Stabilization of RNA G-quadruplexes in the SARS-CoV-2 genome inhibits viral infection via translational suppression. **Arch Pharm Res.** 2023 Jul;46(7):598-615. doi: 10.1007/s12272-023-01458-x.
3. AC-motif: A DNA motif containing adenine and cytosine repeat plays a role in gene regulation. **Nucleic Acids Research**, 2021 Sep 1. doi.org/10.1093/nar/gkab728.
4. The effect of hairpin loop on the structure and gene expression activity of the long-loop G-quadruplex. **Nucleic Acids Research**, 2021 Aug 27. doi.org/10.1093/nar/gkab739.
5. An antibacterial nanorobotic approach for the specific targeting and removal of multiple drug-Resistant *Staphylococcus aureus*. **Small**, 2021 Apr 10. doi.org/10.1002/smll.202100257.

Noncanonical DNAs: Structure, function and modulation

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Abstract

Most DNA in the genome is considered to be present as a B-form, but number of evidences support that DNA structures are highly polymorphic. Therefore, many sequence-specific noncanonical DNA (ncDNA) or non-B-DNA conformations transiently exist in the genome, often in response to changes in the cellular environment or when bound to proteins. A number of ncDNA structures including triplexes, hairpin, left-handed DNA, and G-quartet (tetraplexes) are involved in various cellular events including chromatin remodeling, replication, transcription and recombination, and thus their presence or mutation is relevant to the various disease including tumors. In addition, it is verified that many genetic diseases are closely related to ncDNA. Therefore, it is considered that regulation of ncDNA formation is crucial to understand its cellular function and to develop a novel strategy for curing the related diseases. In this presentation, current progress of our studies on modulation of ncDNA to develop antibiotics will be introduced.