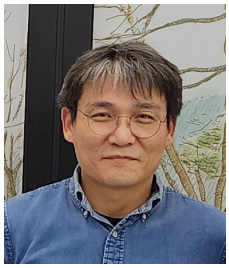
Dae-Ro Ahn, Principal Researcher

Chemical and Biological Integrative Research Center, Korea Institute of Science and Technology (KIST), Seoul 02792, Korea
Tel: +82-2-958-6645
Email: drahn@kist.re.kr



2014 - Present Principal Researcher, KIST
2008-2014 Senior Researcher, KIST
2003-2008 Researcher, KIST
2005-2006 Postdoctoral Fellow, University of Florida
2003 PhD University of Bern, Bern, Switzerland
2000 MS Seoul National University, Seoul, Korea
1998 BS Seoul National University, Seoul, Korea

Research Interests:
Nucleic acid chemistry, Chemical biology, Drug delivery, XNA

Selected Publications:

1. Kim KR, Kang JH, Thai HBD, Back JH, Mao C, Lee JE, Ko YT*, **Ahn DR***, Systemic brain delivery of oligonucleotide therapeutics enhanced by protein coron-assisted DNA cubes. ***Small Methods*** **2024** Early View

2. Kim KR, Kim J, Back JH, Lee JE, **Ahn DR***, Cholesterol-mediated seeding of protein corona on DNA nanostructures for targeted delivery of oligonucleotide therapeutics to treat liver fibrosis. ***ACS Nano*** **2022**, 16, 7331

3. Thai HBD, Kim KR, Hong KT, Voitsitskyi T, Lee JS, Mao C, **Ahn DR***, Kidney-targeted cytosolic delivery of siRNA using a small-sized mirror DNA tetrahedron for enhanced potency. ***ACS Cent Sci*** **2020**, 6, 2250

4. Kim J, Jeon S, Kang SJ, Kim KR, Thai HBD, Lee S, Kim S, Lee YS*, **Ahn DR***, Lung-targeted delivery of TGF-b antisense oligonucleotides to treat pulmonary fibrosis. ***J. Control Release*** **2020**, 322, 108

5. Kim KR, Kang SJ, Lee AY, Hwang D, Park M, Park H, Kim S, Hur K, Chung HS, Mao C, **Ahn DR***, Highly tumor-specific DNA nanostructures discovered by in vivo screening of a nucleic acid cage library and their applications in tumor-targeted drug delivery. ***Biomaterials*** **2019**, 195, 1

Tissue-specific drug delivery platforms based on DNA nanostructures

Dae-Ro Ahn

Chemical and Biological Integrative Research Center, Korea Institute of Science and Technology (KIST), Seoul, 02792, Korea.

Abstract

Due to the complexity of the in vivo environment, it is challenging to design a nanoconstruct that targets a specific tissue. In this study, we developed targeted drug carriers by screening a library of self-assembled nucleic acid (NA) nanostructures in vivo. We intravenously injected various NA nanostructures into mice and examined their biodistribution in major organs to discover the intrinsic tissue specificity of NA nanostructure. We further utilized the tissue-specific NA nanostructures as carriers for targeted drug delivery. The study demonstrates that the library-based strategy to discover targeted drug carriers can be an efficient way to develop nanomedicines with tissue specificity and enhanced potency.