



San Hae Im

Ph.D.

Biological Sciences, KAIST

Contact Information

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Homepage

https://nature091002.github.io/

Nationality

Republic of Korea

Skills

CRISPR/Cas9 design

Gene editing analysis

Protein purification

Bio conjugation

Nano medicine (LNP, Polymer)

mRNA design & synthesis

In vivo study (i.v., i.p., i.m., i.t.)

Delivery

Diagnostics

NGS

Confocal

FACS

Immunoassay

qPCR

Languages

• Korean

• English



Education

Mar. 2017 - Feb. 2024

**KAIST, Korea Advanced Institute of Science and Technology**

Department of Biological Sciences  
Integrated Master's and Doctoral Program  
(Advisor: Prof. Hyun Jung Chung)

Mar. 2013 - Feb. 2017

**KU, Korea University**

Division of Life Sciences  
B.S., KU-KIST Interdisciplinary Program

Mar. 2011 - Feb. 2013

**Hansung Science High School**

Early Graduation



Honors, Awards and Scholar

Feb. 2024

Excellent Oral Presentation Award  
KAIST BK21 FOUR Program  
2024 Graduate Research Conference (Gangwon-do, Korea)

Nov. 2023

KAIST Q-Day Student Special Awards  
Category: Advanced Research (Daejeon, Korea)

Dec. 2022

Wooduk Foundation Scholarship

May. 2019

Excellent Paper Presentation Award  
Korean Society of Industrial and Engineering Chemistry (KSIEC)  
2019 Spring Meeting (Busan, Korea)

Oct. 2016

Synthetic Biology iGEM Competition  
Gold prize (Boston, USA)

Feb. 2012

The 18th Samsung Electronics Humantech Thesis Prize  
Bronze prize (Seoul, Korea)



Publications

Under review

"[Oligonucleotide-linked lipid nanoparticles as a versatile mRNA vaccine platform](#)"  
**San Hae Im**<sup>†</sup>, Youseung Chung<sup>†</sup>, Nevena Duskunovic, Heewon Choi, Su-Hyung Park<sup>\*</sup>, and Hyun Jung Chung<sup>\*</sup>

In revision

"An Antibody-CRISPR/Cas Conjugate Platform for Target-Specific Delivery and Gene Editing in Cancer"  
Seungju Yang, **San Hae Im**, Ju Yeon Chung, Juhee Lee, Kyung-Hun Lee, Yoo Kyung Kang, and Hyun Jung Chung<sup>\*</sup>

In revision

"[Finely Tuned Ionizable Lipid Nanoparticles for CRISPR/Cas9 Ribonucleoprotein Delivery and Gene Editing](#)"  
**San Hae Im**<sup>†</sup>, Mincheol Jang<sup>†</sup>, Ji-Ho Park<sup>\*</sup>, Hyun Jung Chung<sup>\*</sup>

Jan. 2024

"[A Wireless, CRISPR-Polymer Dot Electrochemical Sensor for the Diagnosis of Bacterial Pneumonia and Multi-Drug Resistance](#)"  
**San Hae Im**<sup>†</sup>, Akhmad Irhas Robby<sup>†</sup>, Heewon Choi, Ju Yeon Chung, Yang Soo Kim<sup>\*</sup>, Sung Young Park<sup>\*</sup>, Hyun Jung Chung<sup>\*</sup>  
*ACS Applied Materials & Interfaces* 16, 5637-5647.

Jul. 2023

"[Bioorthogonal CRISPR/Cas9-Drug Conjugate: A Combinatorial Nanomedicine Platform](#)"  
Marcel Janis Beha<sup>†</sup>, Joo-Chan Kim<sup>†</sup>, **San Hae Im**<sup>†</sup>, Yunsu Kim, Seungju Yang, Juhee Lee, Yu Ri Nam, Haeshin Lee, Hee-Sung Park<sup>\*</sup>, Hyun Jung Chung<sup>\*</sup>  
*Advanced Science*, 10, 2302253.

May. 2023

"Effective mRNA Delivery by Condensation with Cationic Nanogels Incorporated into Liposomes"  
Nevena Duskunovic, **San Hae Im**, Juhee Lee, Hyun Jung Chung<sup>\*</sup>  
*Molecular Pharmaceutics* 20, 3088-3099.

Apr. 2023

"[Fabrication of Scratched Nanogroove for Highly-Oriented Cell Alignment and Application as a Wound Healing Dressing](#)"  
Min Jeong Shint<sup>†</sup>, **San Hae Im**<sup>†</sup>, Baekman Kim<sup>†</sup>, Jieun Choi<sup>†</sup>, Stephani Edwina Lucia, Wantae Kim, Jesse G Park, Pilhan Kim<sup>\*</sup>, Hyun Jung Chung<sup>\*</sup>, Dong Ki Yoon<sup>\*</sup>  
*ACS Applied Materials & Interfaces* 15, 18653-18662.

Mar. 2022	"Recyclable Periodic Nanostructure Formed by Sublimable Liquid Crystals for Robust Cell Alignment" Min Jeong Shint, <b>San Hae Im</b> †, Wantae Kim, Hyungju Ahn, Tae Joo Shin, Hyun Jung Chung*, Dong Ki Yoon* <i>Langmuir</i> 38, 3765-3774.
Jan. 2022	"Nano-Assembly of Chemically Tailored Cas9 Ribonucleoprotein for In Vivo Gene Editing and Cancer Immunotherapy" Juhee Leet, Yoo Kyung Kang†, Eonju Oh, Juhee Jeong, <b>San Hae Im</b> , Duk Ki Kim, Haeshin Lee, Sang-Gyu Kim, Keehoon Jung*, Hyun Jung Chung* <i>Chemistry of Materials</i> 34, 547-561.
Oct. 2021	"Cas9 conjugate complex delivering donor DNA for efficient gene editing by homology-directed repair" Yoo Kyung Kang, Juhee Lee, <b>San Hae Im</b> , Joo Hoon Lee, Juhee Jeong, Duk Ki Kim, Seung Yun Yang, Keehoon Jung*, Sang-Gyu Kim*, Hyun Jung Chung* <i>Journal of Industrial &amp; Engineering Chemistry</i> 102, 241-250.
Nov. 2020	"Simple visualized readout of suppressed coffee ring patterns for rapid and isothermal genetic testing of antibacterial resistance" Yoo Kyung Kang, <b>San Hae Im</b> , Jea Sung Ryu, Jaehyun Lee, Hyun Jung Chung* <i>Biosensors and Bioelectronics</i> 168, 112566.
Apr. 2020	"Ultra-fast and universal detection of Gram-negative bacteria in complex samples based on colistin derivatives" Jea Sung Ryu, <b>San Hae Im</b> , Yoo Kyung Kang, Yang Soo Kim, Hyun Jung Chung* <i>Biomaterials Science</i> 8, 2111-2119. (cover article)

## Presentations

Feb. 2024	KAIST BK21 FOUR Program Graduate Research Conference	Talk	Gangwon-do, Korea
Apr. 2023	Society For Biomaterials (SFB) Annual Meeting	Poster	San Diego, USA
Nov. 2022	The Korean Society of Industrial and Engineering Chemistry (KSIEC)	Poster	Daejeon, Korea
Jul. 2022	Frontiers in Genome Engineering (FGE)	-	Seoul, Korea
May. 2022	The Korean Society of Industrial and Engineering Chemistry (KSIEC)	Poster	Jeju, Korea
Apr. 2022	The Polymer Society of Korea	Talk	Daejeon, Korea
Nov. 2021	The Korean Society of Industrial and Engineering Chemistry (KSIEC)	Poster	Daegu, Korea
Nov. 2019	Korean Association for Genome Editing (KAGE)	-	Daejeon, Korea
Oct. 2019	The Korean Society of Industrial and Engineering Chemistry (KSIEC)	Poster	Jeju, Korea
Oct. 2019	Biomedical Engineering Society (BMES)	Poster	Philadelphia, USA
May. 2019	The Korean Society of Industrial and Engineering Chemistry (KSIEC)	Poster	Busan, Korea
Mar. 2019	The Korean Society For Biomaterials (KSBM)	-	Gwangju, Korea
Oct. 2018	KAIST-OSAKA University symposium	Talk	Osaka, Japan
Oct. 2018	The Korean Society of Industrial and Engineering Chemistry (KSIEC)	Poster	Jeju, Korea
May. 2018	The Korean Society of Industrial and Engineering Chemistry (KSIEC)	Poster	Daegu, Korea
Nov. 2017	The Korean Society of Industrial and Engineering Chemistry (KSIEC)	-	Busan, Korea
May. 2017	The Korean Society of Industrial and Engineering Chemistry (KSIEC)	-	Gwangju, Korea

## Patents

2021	Genome Editing Protein Randomly Incorporated with Unnatural Amino Acid and Biorthogonal Complex Delivery
2021	Effective Delivery of mRNA by Modification with Lipid and Lipid Nanoparticles
2019	Lipid Conjugate of CRISPR Protein for Gene Delivery

## Teaching Assistant Experiences

Spring. 2020	General Biology (Prof. Seyun Kim)	Q&A, Test administration and proctoring
Fall. 2020	Biochemistry Experiment (Prof. Yeon-Soo Seo)	Managing experiments (protein purification), Test administration
Fall. 2021	Biological Engineering (Prof. Hyun Jung Chung)	Test administration and proctoring