Soyeon Lee · Portfolio

I studied medicinal chemistry at Seoul National University and taught science to middle and high school students.

Education

Seoul National University

2024.03 – 2026.02

M.S. in Pharmacy · Department of Pharmacy

GPA 4.00 / 4.3 · Research in medicinal chemistry

Dongguk University

2020.03 – 2024.02

B.S. in Chemistry · Teacher education program completed

GPA 4.38 / 4.5 · Highest honors · Semester academic honors seven times

Career interests

Pharmaceuticals · Cosmetics · Chemicals

Regulatory Affairs · Medical Information · Pharmacovigilance · Research Planning

Selected research results

10 analogues

Nucleoside analogues synthesized and characterized for my thesis

90%

$hA_{2A}AR$ binding inhibition for 13a and 13h in an external assay at 10 μM

Skills and credentials

Area	Experience and tools
Laboratory	Organic synthesis, purification, NMR and mass spectrometry interpretation
Software	ChemDraw, Mnova, introductory Schrödinger training and Gaussian DFT coursework
Qualifications	Secondary School Teacher Certificate, Grade 2 (Chemistry) · Computer Proficiency Certificate, Level 2 · OPIc IH
Training	Pharmaceutical and biopharmaceutical quality training (QC/QA) · 14 h

Carbocyclic nucleoside synthesis

Master's thesis · 2024.03 – 2025.09

Synthesized 10 carbocyclic nucleoside analogues from D-ribose, retaining the two fluorine substituents inspired by gemcitabine while replacing the ring oxygen with carbon. The series included adenine, guanine, cytosine and uracil derivatives.

> **10% → 35%**
> Coupling yields with 18-crown-6 and different bases

Coupling yield by base

Compared three bases using 18-crown-6 as the additive.

Base	Yield	0–40%
NaH	10%	
Cs_2CO_3	25%	
K_2CO_3	35%	

Characterization and documentation

Acquired and interpreted ^{1}H, ^{13}C and ^{19}F NMR spectra, and compared externally measured HRMS results with calculated masses. Documented procedures, yields, structural characterization and external evaluation results in an English-language thesis.

Anticancer assay results

An external laboratory tested nine compounds against six human cancer cell lines. All IC_{50} values were above 20 μM. In a lab meeting, I proposed antiviral testing based on related literature.

Conference poster

20th Medicinal Chemistry Division Summer Workshop · 2025.06.25

First author · poster presentation · 2′,2′-Difluoro carbocyclic nucleoside analogues

A_{2A} receptor binding

Collaborative research · 2025.01 – 2025.09

Agreed on target compounds with a collaborator and synthesized 10 C2-aryl analogues by Suzuki coupling and deprotection. Resynthesized ortho- and para-methyl analogues and added a phenyl analogue. Checked the structures using NMR spectra I acquired and external LRMS data.

> **90%**
>
> $hA_{2A}AR$ binding inhibition for 13a and 13h at 10 μM

External binding assay · $hA_{2A}AR$

Analogue	C2-aryl substituent	Inhibition	0–100%
13a	phenyl	90%	
13h	meta-cyano	90%	
13b	meta-methyl	77%	
13e	para-methyl	68%	
13d	ortho-methyl	50%	
13c	meta-formyl	45%	

The external laboratory measured inhibition at a single concentration. This assay did not determine K_i or IC_{50}.

Undergraduate research · Heterocyclic compounds

2021.12 – 2022.12

Synthesized approximately 50 compounds across the project and documented 21 in an undergraduate thesis.

Monitored reactions by TLC and purified products by column chromatography and MPLC. Reviewed ^1H NMR and LC-MS data against the target structures and repurified samples when impurities or residual solvents were detected.

Science teaching and classroom tools

Time Education — Mirae Tamgu

2025.12 – 2026.12

Science Instructor, Mokdong Middle School Division · Teach middle school science, create materials, and manage scores and answer rates. Develop teaching resources, a question database and workflow tools with generative AI.

Daerim Udeungsaeng Academy

2022.12 – 2023.12

Science Instructor · Taught science to students in grades 7–9.

Jungang Sky Academy

2022.03 – 2023.03

Science Instructor · Taught science to students in grades 9–11.

Materials and score reporting

Tool	How I used it
Question database	Selected questions by topic for individual practice sets
PDF → HWPX	Converted exam PDFs into editable Hangul documents
Excel score reports	Compiled weekly test scores and answer rates for individual student reports
Textbooks	Created 300+ teaching illustrations and reviewed a textbook of more than 100 pages

Volunteering and mentoring

107 h · Online science mentoring through Dongguk University (2021–2023)

456 h · Educational mentoring. KT online program, 256 h. Community child center, 100 h. Changdong Youth Center, 100 h.