Daniel Y. Yoo

Bioengineering | Synthetic Biology | Food Biotechnology | Chemical Biology

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EDUCATION

Ph.D. Chemistry | **New York University** | New York, NY 2013 – 2020

M.S. Biomedical Engineering | **New York University** | New York, NY 2011 – 2013

B.S. Bioengineering | **University of California, Berkeley** | Berkeley, CA 2005 – 2009

RESEARCH EXPERIENCE

Assistant Professor | **Texas Tech University** | Lubbock, TX 2026 – Present
Department of Chemical Engineering | Edward E. Whitacre Jr. College of Engineering
Research summary: Engineering programmable microbes for food, health, and sustainability

Postdoctoral Associate | **Massachusetts Institute of Technology** | Cambridge, MA 2021 – 2026
PI: Professor Christopher A. Voigt | Department of Biological Engineering
Research summary: Leveraging synthetic biology, chemistry, and microbiology to develop commensal bacteria and non-model microorganisms for novel uses in human disease, therapeutics, and food

- Engineering human skin bacteria to degrade skin fatty acids and biosynthesize volatile terpenes for altering skin chemistry
- Upcycling mixed plastic waste into nutritious biomass from a modified soil microbe via a hybrid chemical-biological approach
- Using GRAS microorganisms grown from byproducts of low-cost electrochemical reduction of CO_2 as a food source

Ph.D./Graduate Student Researcher | **New York University** | New York, NY 2013 – 2020
PI: Professor Paramjit S. Arora | Department of Chemistry
Research summary: Combining chemistry and biology to create peptide-based inhibitors targeting protein-protein interactions
Dissertation: Covalent and non-covalent targeting of Ras with rationally designed peptidomimetics

- Targeted PPIs associated with cancer and other disease states using rationally designed peptido- and proteo-mimetics loaded with non-canonical amino acids, reactive electrophilic warheads, or bivalent functional groups
- Elucidated an exploitable uptake pathway via macropinocytosis for diverse peptide scaffolds in Ras mutant cancers

M.S./Graduate Student Researcher | **New York University** | New York, NY 2011 – 2013
PI: Professor Paulo G. Coelho | Department of Biomaterials and Biomimetics
Research summary: Bone regeneration using grafts, synthetic scaffolds, and biocompatible implants within various animal models (*i.e.* monkey, dog, rabbit, sheep, and human)
Thesis: Efficacy and viability analysis of BMP-2-coated titanium implants within a sheep iliac model

Staff Research Associate | **University of California, San Francisco** | San Francisco, CA 2009 – 2011
PI: Professor Didier Y. Stainier | Department of Biochemistry and Biophysics
Research summary: High-throughput small molecule screens in transgenic zebrafish models for pancreatic β-cell regeneration

Undergraduate Researcher | **University of California, Berkeley** | Berkeley, CA 2007 – 2009
PI: Professor Luke P. Lee | Department of Bioengineering
Research summary: Gold nanoparticle carriers for the selective release of antisense oligonucleotide payloads via optical excitation to target the HER2/neu receptor of breast cancer cells

PEER-REVIEWED PUBLICATIONS

[20] Scarinci, G.*, **Yoo, D.Y.***, Herzog, A., Nitsche, A., Shao-Horn, Y., Voigt, C.A. "Electrochemical conversion of CO_2 into C1 and C2 compounds for engineered edible bacteria and fungi in a closed-loop cycle," Manuscript in preparation, 2026.

[19] **Yoo, D.Y.**, Hassan, M.I., Nguyen, T.D., Schneider, J.J., Maloney, A.L., Vedula, E.M., Merriman, J.A., Yang, D.F., Akbari, O.S., Fischbach, M.A., Voigt, C.A. "Engineering the human skin bacterium *Staphylococcus epidermidis* to make or degrade chemicals," Manuscript under revision, *Nat Comm*, 2026.

[18] **Yoo, D.Y.**, de Winter, T.M., Hassan, M.I., Stukenbroeker, T.S., Nattermann, U., Wang, A.Z., Yadav, S., Vientos-Robles, Y., Ho, J., Higginson, C.J., Yu, O., Le Roy, J.J., Voigt, C.A. "Polyethylene waste conversion to protein and vitamins using a chemical-biological process," Manuscript accepted in principle, *Nat Chem Eng*, 2026.

[17] **Yoo, D.Y.***, Hong, S.H.*, Conway, L., Richards-Corke, K.C., Parker, C.G., Arora, P.S. "A Sos proteomimetic as a pan-Ras inhibitor," *Proc Natl Acad Sci*, 2021, 118(18), pp. 1-11.

[16] **Yoo, D.Y.**, Barros, S.A., Brown, G.C., Rabot, C., Bar-Sagi, D., Arora, P.S. "Macropinocytosis as a key determinant of peptidomimetic uptake in cancer cells," *J Am Chem Soc*, 2020, 142(34), pp. 14461-14471.

[15] **Yoo, D.Y.**, Hauser, A.D., Joy, S.T., Bar-Sagi, D., Arora, P.S. "Covalent targeting of Ras G12C by rationally designed peptidomimetics," *ACS Chem Bio*, 2020, 15(6), pp. 1604-1612.

[14] Bowers, M., **Yoo, D.**, Marin, C., Gil, L., Shabaka, N., Goldstein, M., Janal, M., Tovar, N., Hirata, R., Bonfante, E., Coelho, P.G. "Surface characterization and in vivo evaluation of laser sintered and machined implants followed by resorbable-blasting media process: A study in sheep," *Med Oral Patol Oral Cir Bucal*, 2016, 21(2), pp. 206-213.

[13] Sarendranath, A., Khan, R., Marin, C., **Yoo, D.**, Redisch, J., Jimbo, R., Coelho, P.G. "Effect of low speed drilling on osseointegration using simplified drilling procedures," *Brit J Or Max Sur*, 2015, 53(6), pp. 550-556.

[12] **Yoo, D.**, Marin, C., Freitas, G., Tovar, N., Bonfante, E., Teixeira, H., Janal, M., Coelho, P.G. "Surface characterization and in vivo evaluation of dual acid-etched and grit-blasted/acid-etched implants in sheep," *Imp Dent*, 2015, 24(3), pp. 256-262.

[11] Galli, S., Jimbo, R., Tovar, N., **Yoo, D.**, Anchieta, R.B., Yamaguchi, S., Coelho, P.G. "The effect of osteotomy dimension on osseointegration to resorbable media-treated implants: A study in sheep," *J Biomat App*, 2015, 29(8), pp. 1068-1074.

[10] Tovar, N., Jimbo, R., Witek, L., Anchieta, R., **Yoo, D.**, Manne, L., Machado, L., Gangolli, R., Coelho, P.G. "The physicochemical characterization and in vivo response of micro/nanoporous bioactive ceramic particulate bone graft materials," *Mat Sci Eng C*, 2014, 43, pp. 472-480.

[9] Coelho, P.G., Takayama, T., **Yoo, D.**, Jimbo, R., Karunagaran, S., Tovar, N., Janal, M.N., Yamano, S. "Nanometer-scale features on micrometer-scale surface texturing: A bone histological, gene expression, and nanomechanical study," *Bone*, 2014, 65, pp. 25-32.

[8] Shapiro, M., Tovar, N., **Yoo, D.**, Sobieraj, R.C., Gupta, N., Branski, R., Coelho, P.G. "Strain rate effects on the mechanical properties and fracture mode of skeletal muscle," *Mat Sci Eng C,* 2014, 39(1), pp. 100-104.

[7] Jimbo, R., Tovar, N., Janal, M.N., Mousa, R., Marin, C., **Yoo, D.**, Teixeira, H., Anchieta, R.B., Bonfante, E.A., Konishi, A., Takeda, K., Kurihara, H., Coelho, P.G. "The effect of brain-derived neurotrophic factor on periodontal furcation effects," *PLOS One*, 2014, 9(1), pp. 1-9.

[6] Tovar, N., Jimbo, R., Gangolli, R., Perez, L., Manne, L., **Yoo, D.**, Lorenzoni, F., Witek, L., Coelho, P.G. "Evaluation of bone response to various anorganic bovine bone xenografts: an experimental calvaria defect study," *Int J Or Max Surg*, 2013, pp. 1-10.

[5] **Yoo, D.**, Tovar, N., Jimbo, R., Marin, C., Anchieta, R.B., Machado, L.S., Guastaldi, F.P.S., Janal, M.N., Coelho, P.G. "Increased osseointegration effect of BMP-2 on dental implants: An in vivo study," *J Biomed Mat Res A*, 2013, 102(6), pp. 1921-1927.

[4] Jimbo, R., Tovar, N., **Yoo, D.Y.**, Janal, M.N., Anchieta, R.B., Coelho, P.G. "The effect of different surgical drilling procedures on full laser-etched microgrooves surface-treated implants: an experimental study in sheep," *Clin Or Imp Res*, 2013, pp. 1-6.

[3] Guastaldi, F.S., **Yoo, D.**, Marin, C., Jimbo, R., Tovar, N., Zanetta-Barbosa, D., Coelho, P.G. "Plasma treatment maintains surface energy of the implant surface and enhances osseointegration," *Int J Biomat*, 2012, pp. 1-6.

[2] Andersson, O., Adams, B.A., **Yoo, D.**, Ellis, G.C., Gut, P., Anderson, R.M., German, M.S., Stainier, D.Y.R. "Adenosine signaling promotes regeneration of pancreatic beta cells in vivo," *Cell Metab*, 2012, 15(6), pp. 885-894.

[1] Lee, S.E., Sasaki, D.Y., Perroud, T.D., **Yoo, D.**, Patel, K.D., Lee, L.P. "Biologically functional cationic phospholipid-gold nanoplasmonic carriers," *J Am Chem Soc*, 2009, 131(39), pp. 14066-14074.

PATENTS

[2] U.S. Patent 2024/023221 (2024): Engineering human skin microbes to produce mosquito repellent terpenes.

[1] U.S. Patent 2024/0124539 A1 (2024): Crosslinked helix dimer mimics of Sos and methods of using same.

BOOK CHAPTERS

[1] **Yoo, D.Y.**, Arora, P.S. "Hydrogen bond surrogate stabilized helices as protein-protein interaction inhibitors," *Protein-protein interaction regulators*, Royal Society of Chemistry, London, UK, 2020, pp. 124-146.

INVITED TALKS

[2] "Covalent and non-covalent targeting of Ras." Chemical Biology Seminar, New York University, New York, NY, Oct 2019.

[1] "Covalent targeting of Ras by rationally designed peptidomimetics." Molecular Biophysics Program, New York University Grossman School of Medicine, New York, NY, Feb 2019.

CONFERENCE PRESENTATIONS

[14] "Conversion of Polyethylene Waste into Nutritious Biomass using a Chemical-Biological Process" (**Oral**). American Institute of Chemical Engineering Annual Meeting, Boston, MA, Nov 2025. Presentation 272e.

[13] "Chimeric Synthetic Cells for Programmable Biomanufactories and Food Production" (**Poster**). American Institute of Chemical Engineering Annual Meeting, Boston, MA, Nov 2025. Meet the Faculty Candidate Session, Poster 3v.

[12] "Bacterial Deodorant: Engineering Human Skin Commensals to Degrade Volatile Mosquito Attractants from the Skin Metabolome" (**Oral**). Synthetic Biology: Engineering, Evolution & Design, Society for Biological Engineering, Los Angeles, CA, Jun 2023.

[11] "Commensal Engineering to Change the Chemical Composition of Skin" (**Poster**). International Conference on Microbiome Engineering, Society for Biological Engineering, Boston, MA, Nov 2024.

[10] "Exploiting the Hunger of Cancer Cells for Peptide Therapeutics" (**Poster**). Chemical Biology Year-End Symposium, New York Academy of Sciences, New York, NY, May 2019.

[9] "Covalent Targeting of Ras by Rationally Designed Peptidomimetics" (**Poster**). Medicinal and Bioorganic Chemistry Conference, Steamboat Springs, CO, Jan 2019.

[8] "Covalent Targeting of Ras by Rationally Designed Peptidomimetics" (**Poster**). Tri-Institutional PhD Program in Chemical Biology Symposium, Rockefeller University, New York, NY, Sep 2018.

[7] "Covalent Targeting of Ras by Rationally Designed Peptidomimetics" (**Poster**). Nature Conference on Chemical Biology, New York University, New York, NY, Aug 2018.

[6] "Covalent Targeting of Ras by Rationally Designed Peptidomimetics" (**Poster**). Bioorganic Chemistry Symposium, Gordon Research Council, Andover, NH, Jun 2018.

[5] "Covalent Targeting of Ras by Rationally Designed Peptidomimetics" (**Poster**). Chemical Biology Year-End Symposium, New York Academy of Sciences, New York, NY, May 2018.

[4] "Covalent targeting of protein-protein interactions by rationally designed peptidomimetics" (**Poster**). Chemical Biology Year-End Symposium, New York Academy of Sciences, New York, NY, May 2016.

[3] "Osseointegration effect of BMP-2 on dental implants: A 3-6 week in vivo study" (**Poster**). Biomaterials Revolution – Annual Meeting and Exposition, Society for Biomaterials, Boston, MA, May 2013.

[2] "Periodontal regeneration using brain-derived neurotrophic factor: A non-human primates study" (**Poster**). General Session and Exhibition, American Association for Dental Research, Seattle, WA, Mar 2013.

[1] "Osseointegration effect of BMP-2 on dental implants: A 3-6 week in vivo study" (**Poster**). Grand Challenges in Biomaterials, Society for Biomaterials, New Orleans, LA, Oct 2012.

HONORS AND AWARDS

Medicinal & Bioorganic Chemistry Foundation Scholar Award	2018
Tri-Institutional PhD Program in Chemical Biology Symposium Poster Prize	2018
NYU College of Arts and Sciences Outstanding Teaching Award	2016
The Henry M. MacCracken Fellowship	2013 – 2015
The Ines Mandl Fellowship	2012 – 2013
Graduate Center Merit Scholarship	2011 – 2013

PROFESSIONAL AFFILIATIONS

[5]	Sigma Xi Honor Society	2025 – Present
[4]	American Institute of Chemical Engineers	2023 – Present
[3]	American Chemical Society	2016 – 2021
[2]	New York Academy of Sciences	2014 – 2021
[1]	Society for Biomaterials	2013 – 2014

TEACHING EXPERIENCE

[7] Course Instructor | CHEM-4363/5363: Biochemical Engineering | Texas Tech University — Fall 2026

[6] Recitation Instructor | CHEM-UA 881: Biochemistry I | New York University — Fall 2015
- **Awarded outstanding teaching award by student and faculty nomination**

[5] Lab Instructor | CHEM-UA 226: Organic Chemistry II Lab | New York University — Spring 2015

[4] Recitation Instructor | CHEM-UA 225: Organic Chemistry I | New York University — Fall 2014

[3] Lab Instructor | CHEM-UA 227: Majors Organic Chemistry I Lab | New York University — Fall 2014

[2] Recitation Instructor | CHEM-UA 125: General Chemistry I | New York University — Spring 2014

[1] Lab Instructor | CHEM-UA 125: General Chemistry I Lab | New York University — Spring 2014

SERVICE AND OUTREACH

[3] Mentor | Letters to a Pre-Scientist — 2024 – Present
- **Selected as an outstanding mentor by student and teacher nomination**

[2] Research Mentor | Voigt Lab | Massachusetts Institute of Technology — 2023 – Present

[1] Research Mentor | Arora Lab | New York University — 2015 – 2020

TECHNICAL SKILLS

LABORATORY TECHNIQUES

UV Spectroscopy	PCR/qPCR/rt-qPCR	Fluorescent/Confocal Microscopy	HPLC/LCMS/LC-TOF/MALDI-TOF
Protein Expression	Western/Northern Blot	Cell Permeability Assays	SDS-PAGE/Agarose Gel Electrophoresis
Animal Surgeries	Flow Cytometry/FACS	Histology/Histomorphometry	Mammalian/Bacteria/Yeast/Fungi Culture
Nanoindentation	X-ray Diffraction Analysis	Hyperspectral Imaging	FTIR/SPR/BLI/FP/CD/AFM/SEM
Organic Synthesis	Mechanical Stress Testing	Mutagenesis/Directed Evolution	Solid/Solution-Phase Peptide Synthesis
Cell Viability Assays	Liquid/Headspace GCMS	High-throughput Chemical Screens	Plasmid/Cloning/Conjugation/Transfection
NMR Spectrometry	Nanoparticle Synthesis	Micro-Computerized Tomography	Microfluidic Device Fabrication w/ PDMS

PROGRAMMING

Prism	ImageJ	ChemDraw	AutoCAD	Comsol	Python
FlowJo	PyMol	UCSF Chimera	SolidWorks	Matlab	MacroModel
InstantJChem	R	Adina	Amira	Perl	DraftSight

MENTORED STUDENT REFERENCES

[4] **Danny F. Yang**
Current role: Graduate student | Columbia University
Former role: Undergraduate researcher | Voigt Lab | Massachusetts Institute of Technology
Timeline: 2023 – 2026
Contact: danfyang@mit.edu

[3] **Khyle C. Richards-Corke, Ph.D.**
Current role: Scientist II | WuXi Biologics
Former role: Graduate student | Balskus Lab | Harvard University
Timeline: 2018 – 2020
Contact: khylerichardscorke@g.harvard.edu

[2] **Chris A. Rabot, Ph.D.**
Current role: Team lead | Exozymes
Former role: Research intern | University of Southern California
Timeline: 2016 – 2017
Contact: carabot94@gmail.com

[1] **Catherine G. Pratt, M.D., M.S.**
Current role: Surgical resident | General Surgery | University of Cincinnati, College of Medicine
Former role: Undergraduate researcher | Arora Lab | New York University
Timeline: 2015 – 2017
Contact: prattcg@ucmail.uc.edu

FACULTY REFERENCES

[3] **Christopher A. Voigt, Ph.D.**
Relationship: Postdoctoral Research Supervisor
Current role: Daniel I.C. Wang Professor of Biological Engineering (Department head)
Current institution: Massachusetts Institute of Technology
Contact: cavoigt@gmail.com

[2] **Paramjit S. Arora, Ph.D.**
Relationship: Ph.D. Advisor
Current role: Professor of Chemistry
Current institution: New York University
Contact: arora@nyu.edu

[1] **Paulo G. Coelho, M.D., D.D.S., Ph.D.**
Relationship: M.S. Advisor
Current role: Professor of Biochemistry and Molecular Biology
Current institution: University of Miami, Miller School of Medicine
Former role: Professor and Director of Biomaterials and Biomimetics | New York University
Contact: pgc51@med.miami.edu