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## EDUCATION

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| Ph.D. Chemistry   <b>New York University</b>   New York, NY                    | 2013 – 2020 |
| M.S. Biomedical Engineering   <b>New York University</b>   New York, NY        | 2011 – 2013 |
| B.S. Bioengineering   <b>University of California, Berkeley</b>   Berkeley, CA | 2005 – 2009 |

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## RESEARCH EXPERIENCE

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| Assistant Professor   <b>Texas Tech University</b>   Lubbock, TX<br>Department of Chemical Engineering   Edward E. Whitacre Jr. College of Engineering<br><u>Research summary:</u> Engineering programmable microbes for food, health, and sustainability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 2026 – Present |
| Postdoctoral Associate   <b>Massachusetts Institute of Technology</b>   Cambridge, MA<br>PI: Professor Christopher A. Voigt   Department of Biological Engineering<br><u>Research summary:</u> Leveraging synthetic biology, chemistry, and microbiology to develop commensal bacteria and non-model microorganisms for novel uses in human disease, therapeutics, and food <ul style="list-style-type: none"><li>Engineering human skin bacteria to degrade skin fatty acids and biosynthesize volatile terpenes for altering skin chemistry</li><li>Upcycling mixed plastic waste into nutritious biomass from a modified soil microbe via a hybrid chemical-biological approach</li><li>Using GRAS microorganisms grown from byproducts of low-cost electrochemical reduction of CO<sub>2</sub> as a food source</li></ul> | 2021 – 2026    |
| Ph.D./Graduate Student Researcher   <b>New York University</b>   New York, NY<br>PI: Professor Paramjit S. Arora   Department of Chemistry<br><u>Research summary:</u> Combining chemistry and biology to create peptide-based inhibitors targeting protein-protein interactions<br><u>Dissertation:</u> Covalent and non-covalent targeting of Ras with rationally designed peptidomimetics <ul style="list-style-type: none"><li>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</li><li>Elucidated an exploitable uptake pathway via macropinocytosis for diverse peptide scaffolds in Ras mutant cancers</li></ul>                             | 2013 – 2020    |
| M.S./Graduate Student Researcher   <b>New York University</b>   New York, NY<br>PI: Professor Paulo G. Coelho   Department of Biomaterials and Biomimetics<br><u>Research summary:</u> Bone regeneration using grafts, synthetic scaffolds, and biocompatible implants within various animal models ( <i>i.e.</i> monkey, dog, rabbit, sheep, and human)<br><u>Thesis:</u> Efficacy and viability analysis of BMP-2-coated titanium implants within a sheep iliac model                                                                                                                                                                                                                                                                                                                                                       | 2011 – 2013    |
| Staff Research Associate   <b>University of California, San Francisco</b>   San Francisco, CA<br>PI: Professor Didier Y. Stainier   Department of Biochemistry and Biophysics<br><u>Research summary:</u> High-throughput small molecule screens in transgenic zebrafish models for pancreatic $\beta$ -cell regeneration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 2009 – 2011    |
| Undergraduate Researcher   <b>University of California, Berkeley</b>   Berkeley, CA<br>PI: Professor Luke P. Lee   Department of Bioengineering<br><u>Research summary:</u> Gold nanoparticle carriers for the selective release of antisense oligonucleotide payloads via optical excitation to target the HER2/neu receptor of breast cancer cells                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2007 – 2009    |

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## PEER-REVIEWED PUBLICATIONS

- [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.

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## 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.
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## 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.
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## 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.
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## 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.
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## HONORS AND AWARDS

|                                                                          |      |
|--------------------------------------------------------------------------|------|
| Medicinal & Bioorganic Chemistry Foundation Scholar Award                | 2018 |
| Tri-Institutional PhD Program in Chemical Biology Symposium Poster Prize | 2018 |

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|-------------------------------------------------------------|-------------|
| 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

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|-----------------------------------------------------------------------------------------|-------------|
| [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 |