

Natalie DeForest

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EDUCATION:

- PhD Biomedical Sciences, Specialization in Bioinformatics** Sept 2018 – Present
University of California San Diego La Jolla, CA
- **Dissertation:** “Leveraging human genetics and functional genomics to investigate insulin resistance related disorders”
 - Thesis advisor: Dr. Amit Majithia
 - Cumulative Overall GPA: 3.8
- BS Pharmaceutical Chemistry, Minor Quantitative Biology and Bioinformatics, *summa cum laude*** June 2018
University of California Davis Davis, CA
- Cumulative Overall GPA: 3.8
 - Major/Minor GPA: 3.9
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HONORS / AWARDS:

- Institutional National Research Service Award (T32) Grant Recipient** June 2020
National Institute of General Medical Sciences (NIGMS)
- Best Poster Awardee** March 2020
University of California San Diego Training Program in Basic and Clinical Genetics
- Departmental Highest Honors Research Award** June 2018
University of California Davis Dept. of Chemistry
- Departmental Citation for Outstanding Graduating Senior** June 2018
University of California Davis Dept. of Chemistry
- Scholarship for Outstanding Performance in Pharmaceutical Chemistry** June 2015, 2017
University of California Davis Dept. of Chemistry
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PUBLICATIONS:

- 2023 **DeForest N**, Kavitha B, Hu S, Isaac R, Krohn L, Wang M, Du X, Saldanha CDA, Gyls J, Merli E, Abagyan R, Najimi L, Mohan V, Alnylam Human Genetics, AMP-T2D Consortium, Flannick J, Peloso GM, Heinz S, Gordts P, Khera AV, Olefsky J, Radha V, Majithia AR. Human gain-of-function variants in HNF1A confer protection from diabetes but independently increase hepatic secretion of atherogenic lipoproteins. *Cell Genomics*. May 30, 2023; 100339. doi: [10.1016/j.xgen.2023.100339](https://doi.org/10.1016/j.xgen.2023.100339).
- Trieger GW, Pessentheiner AR, Purcell SC, Green CR, **DeForest N**, Willert K, Majithia AR, Metallo CM, Godula K, Gordts PLSM. Glycocalyx engineering with heparan sulfate mimetics attenuates Wnt activity during adipogenesis to promote glucose uptake and metabolism. *Journal of Biological Chemistry*. 2023 Mar 15;104611. doi: [10.1016/j.jbc.2023.104611](https://doi.org/10.1016/j.jbc.2023.104611). PMID: 36931394.

- 2022 Isaac R, Vinik Y, Mikl M, Nadav-Eliyahu S, Shatz-Azoulay H, Yaakobi A, **DeForest N**, Majithia AR, Webster NJG, Shav-Tal Y, Elhanany E, Zick Y. A seven-transmembrane protein-TM7SF3, resides in nuclear speckles and regulates alternative splicing. *iScience*. 2022 Oct 4;25(11):105270. doi: [10.1016/j.isci.2022.105270](https://doi.org/10.1016/j.isci.2022.105270). PMID: 36304109; PMCID: PMC9593240.
- DeForest N**, Majithia AR. Genetics of Type 2 Diabetes: Implications from Large-Scale Studies. *Curr Diab Rep*. 2022 May;22(5):227-235. doi: [10.1007/s11892-022-01462-3](https://doi.org/10.1007/s11892-022-01462-3). Epub 2022 Mar 19. PMID: 35305202; PMCID: PMC9072491.
- 2021 Du X, **DeForest N**, Majithia AR. Human Genetics to Identify Therapeutic Targets for NAFLD: Challenges and Opportunities. *Front Endocrinol*. 2021 Dec 7;12:777075. doi: [10.3389/fendo.2021.777075](https://doi.org/10.3389/fendo.2021.777075). PMID: 34950105; PMCID: PMC8688763.
- 2020 Liang X, Park Y, **DeForest N**, Hao J, Zhao X, Niu C, Wang K, Smith B, Lai Y. In Vitro Hepatic Uptake in Human and Monkey Hepatocytes in the Presence and Absence of Serum Protein and Its In Vitro to In Vivo Extrapolation. *Drug Metab Dispos*. 2020 Dec;48(12):1283-1292. doi: [10.1124/dmd.120.000163](https://doi.org/10.1124/dmd.120.000163). Epub 2020 Oct 9. PMID: 33037043.

RESEARCH PRESENTATIONS:

- 2023 DeForest N. (June 2023) Human gain-of-function variants in HNF1A confer protection from diabetes but independently increase hepatic secretion of atherogenic lipoproteins. Short talk presented at UCSD Annual Genetics Training Program Retreat in La Jolla, CA, USA.
- DeForest N. (May 2023) Genome-wide discovery of insulin resistance loci using serum triglycerides to HDL-cholesterol ratio. Poster presented at UCSD Dept. of Medicine Research Day in La Jolla, CA, USA.
- DeForest N. (March 2023) Genome-wide discovery of insulin resistance loci using serum triglycerides to HDL-cholesterol ratio. Poster presented at UCSD/UCLA Diabetes Research Center Annual Retreat in La Jolla, CA, USA.
- 2022 DeForest N. (August 2022) Activation of PPARG in skeletal muscle and visceral adipose tissues ameliorate NASH biomarkers in humans: implications for therapeutic targeting. Poster presented at Keystone Conference: Inter Organ Crosstalk in NASH, Whistler, Canada.
- DeForest N. (June 2022) Human gain-of-function variants in HNF1A confer protection from diabetes but independently increase hepatic secretion of multiple cardiovascular disease risk factors. Poster presented at Mutational Scanning Symposium in Toronto, Canada / Virtual.

RESEARCH EXPERIENCE:

Graduate Student Researcher – Laboratory of Dr. Amit Majithia June 2019 – Present
 Department of Medicine, University of California San Diego La Jolla, CA

Dissertation: “Leveraging human genetics and functional genomics to investigate insulin resistance related disorders”

- Integrate high-throughput genomic screens and large-scale human genetic datasets to identify and evaluate novel therapeutic targets for prevalent metabolic disorders such as type 2 diabetes and cardiovascular disease

Research Intern – Drug Metabolism

Gilead Sciences

June 2018 – Sept 2018

Foster City, CA

Project: “Exploring Species Difference in Hepatocytes Uptake”

- Optimized assay in human and monkey hepatocytes to measure transporter mediated hepatic uptake of selected compounds for intra- and inter-species comparison.

Research Intern – Drug Metabolism

Cytokinetics

June 2017 – Sept 2017

South San Francisco, CA

Project: “Investigation and Application of Carboxylesterase Inhibitors to *In Vitro* Drug Metabolism Models for Research and Development”

- Designed, conducted, and validated *in vitro* drug metabolism assays to study the variation in enzyme-mediated degradation of drug compounds.

Undergraduate Honors Researcher – Laboratory of Dr. Xi Chen

Department of Chemistry, University of California Davis

Aug 2016 – June 2018

Davis, CA

Project: “Cloning and Characterization of Hp3FT and SpNanC Enzymes as Efficient Catalysts for Carbohydrate Synthesis”

- Employed molecular biology to clone and characterize enzymes that can be used as catalysts in the chemoenzymatic synthesis of complex carbohydrates.

Project: “Chemoenzymatic Synthesis of Sialyl Lewis X Resembling Sialosides”

- Designed and performed organic synthesis reactions of complex carbohydrates, and executed downstream purification and analytical characterization (TLC, NMR)

SKILLS:**Technical:**

- Next generation sequencing (RNA-seq, ChIP-seq, ATAC-seq) analysis workflows and tools
- Statistical / population genetics analyses (GWAS, PheWAS, TWAS, Mendelian Randomization)
- Mining and analyzing relevant public biological/genomic/transcriptomic databases
- Strong understanding of biostatistics, Bayesian statistics
- Scripting languages (R (preferred), Python), Linux-based environments (bash), high performance computing (HPC) systems, and git version control

Laboratory:

- Next-generation sequencing library preparation
- Basic molecular biology techniques (PCR, gel electrophoresis, gene cloning)
- Working knowledge of genomic technologies (i.e. CRISPR/Cas9), high-throughput functional genomic screens, *in vitro* and *in vivo* models used to identify and validate prioritized targets

General:

- Strong biological understanding of metabolic disease and personalized genomic medicine
- Skilled in written and oral communication with multidisciplinary audiences
- Trained in collaborating with computational scientists, experimentalists, and clinicians
- Adept in perusing scientific literature and understanding emerging studies
- Strong track record of scientific publications, conference presentations, and mentoring
- Previous experience in biotechnology/pharmaceutical industry research and executing academic-industry scientific collaborations

RELEVANT GRADUATE COURSEWORK:

Genetics and Genomics
Quantitative Methods in Genetics
Bioinformatics Algorithms

Personal Genomics and Population Genetics
Statistical Methods in Bioinformatics
Genomics, Proteomics, and Network Biology

PROFESSIONAL EXPERIENCE:**Research Intern – Drug Metabolism**

Gilead Sciences

- Gained experience in industry big pharma

June 2018 – Sept 2018
Foster City, CA

Research Intern – Drug Metabolism

Cytokinetics
CA

- Gained experience in industry mid-sized pharma

June 2017 – Sept 2017
South San Francisco,

STEM Tutor

Student Academic Success Center, University of California Davis

- Tutor undergraduate students in Chemistry, Organic Chemistry, Biology, Physics, Statistics, and Calculus

Sept 2016 – June 2018
Davis, CA

Clinical Data Intern

Pharmacyclics, an Abbvie Company

- Gained exposure to the drug development process of an advanced biopharmaceutical company

June 2016 – Aug 2016
Sunnyvale, CA

Laboratory Assistant

University of California Davis Dept. of Chemistry

- Assisted bio-organic and organic chemistry experiments, maintained laboratory

Aug 2015 – June 2018
Davis, CA

Pharmacy Intern

Rite Aid Pharmacy

- Shadowed pharmacist, verified patient prescriptions

Sept 2015 – Dec 2015
Davis, CA

Barista

Starbucks

May 2015 – Feb 2016
Davis, CA

Science Camp Leader

Galileo Learning

- Led elementary students in scientific projects and assisted instructors in K-1st grade classrooms.

June 2014 – Aug 2015
Fremont, CA

Executive Assistant

Fidus Systems

- Assisted CEO of electronic design company

Aug 2014 – Sept 2014
Milpitas, CA

TEACHING EXPERIENCE:

Student Mentor / Project Consultant, Polygence Education

June 2022 – Present

Mentor to Masters Student Bioinformatics Researcher

Sept 2022 – Present

Instructional Assistant, Undergraduate Bioinformatics Laboratory

Mar 2022 – June 2022

Mentor to Undergraduate Bioinformatics Researchers

June 2020 – Present

COMMUNITY INVOLVEMENT:

Graduate:

Mentor , Biomedical Science Graduate Program	Sept 2019 – Present
Student Representative , Biomedical Sciences Graduate Council	Sept 2019 – Present

Undergraduate:

Mentor , Chemistry Peer Mentoring Program	Sept 2017 – June 2018
Service Member , Prytanean Women's Honors Society	Nov 2016 – June 2018

LANGUAGES:

English – Native proficiency
Mandarin - Limited working proficiency

REFERENCES:

Provided upon request.