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

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

PUBLICATIONS:

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. PMID: 36304109; PMCID: PMC9593240.

DeForest N, Kavitha B, Hu S, Isaac R, Wang M, Du X, Saldanha CDA, Gylys J, 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 protect from diabetes but increase coronary artery disease susceptibility through multiple independent risk factors. *medRxiv* 2022.03.29.22273133; doi: 10.1101/2022.03.29.22273133

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. 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. PMID: 34950105; PMCID: PMC8688763.

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. *bioRxiv* 2021.07.08.451710; doi: https://doi.org/10.1101/2021.07.08.451710

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. Epub 2020 Oct 9. PMID: 33037043.

RESEARCH PRESENTATIONS:

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, 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 June 2018 – Sept 2018
Gilead Sciences Foster City, CA

Project: "Exploring Species Difference in Hepatocytes Uptake"

- Optimized in-house oil spin assay using suspended hepatocytes of human and cynomolgus monkey to measure transporter mediated hepatic uptake of selected compounds for intra- and inter-species comparison.

Research Intern – Drug Metabolism June 2017 – Sept 2017
Cytokinetics 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 Aug 2016 – June 2018
Department of Chemistry, University of California Davis 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 chemoenzymatic and multi-step organic synthesis reactions of novel chemical entities, specifically complex carbohydrates, and executed downstream purification and analytical characterization (TLC, NMR) of synthesized organic compounds.

SKILLS:

Technical:

- Experienced with next generation sequencing (RNA-seq, ChIP-seq, ATAC-seq) analysis workflows and tools
- Proficient in performing statistical / population genetics analyses (GWAS, PheWAS, TWAS, ExWAS, Mendelian Randomization)
- Skilled in mining and analyzing relevant public biological/genomic/transcriptomic databases (e.g. gnomAD, GTEx, ClinVar, Gene Expression Omnibus, GWASdb, PDB, etc)
- Strong understanding of biostatistics, Bayesian statistics
- Fluent with Linux-based environments (bash)
- Proficient in scripting languages (R (preferred), Python) and high-dimensional data visualization
- Experienced with 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 cellular assays, and animal models used to identify and validate prioritized targets

General:

- In-depth biological understanding of metabolic disease (diabetes, cardiovascular disease, NAFLD/NASH/fatty liver disease) and personalized genomic medicine
- Skilled in written and oral communication with multidisciplinary audiences
- Trained in conversing and collaborating with computational scientists, experimentalists, and clinicians
- Adept in perusing scientific literature and understanding emerging studies to expand and maintain relevant scientific knowledge
- Strong track record of scientific publications, conference presentations, and mentoring
- Previous experience in biotechnology/pharmaceutical industry research and executing academic-industry scientific collaborations

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RELEVANT GRADUATE COURSEWORK:

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

PROFESSIONAL EXPERIENCE:

Research Intern – Drug Metabolism June 2018 – Sept 2018
Gilead Sciences Foster City, CA

- Gained experience in industry big pharma

Research Intern – Drug Metabolism June 2017 – Sept 2017
Cytokinetics South San Francisco, CA

- Gained experience in industry mid-sized pharma

STEM Tutor Sept 2016 – June 2018
Student Academic Success Center, University of California Davis Davis, CA

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

Clinical Data Intern June 2016 – Aug 2016
Pharmacyclics, an Abbvie Company Sunnyvale, CA

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

Laboratory Assistant Aug 2015 – June 2018
University of California Davis Dept. of Chemistry Davis, CA

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

Pharmacy Intern Sept 2015 – Dec 2015
Rite Aid Pharmacy Davis, CA

- Shadowed pharmacist, verified patient prescriptions

Barista May 2015 – Feb 2016
Starbucks Davis, CA

Science Camp Leader June 2014 – Aug 2015
Galileo Learning Fremont, CA

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

Executive Assistant Aug 2014 – Sept 2014
Fidus Systems Milpitas, CA

- Assisted CEO of electronic design company

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.