

Jeffrey Ock College Station, TX; Pittsburgh, PA

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Summary:

Stem cell and tissue engineering researcher at the Department of Biomedical Engineering at Texas A&M University with experience in sterile and non-sterile wet labs along with experimental design and project management. Consistent expertise in staining, cell culture, imaging, and data analysis. Competent in “Technical Skills”.

Experience:

Stem Cell & Tissue Engineering Researcher | Department of BME & TAMU

May, 2024 - Present (PAID)

- ❖ Leading project on expandable skin graft grown from hDFs, achieved 67% greater area increase from control.
- ❖ Leading project on highly aligned (anisotropic) interwoven skin graft grown from hDFs.
- ❖ Mentoring, managing, and training 3 undergraduates and a high school student to assist with work.
- ❖ Major contributor to:
 - Bioreactor for mass cell culture of multiple extracellular matrix (ECM) samples.
 - Characterization of different cardiac fibroblasts (Pri-CF, hiPSC-CF) on anisotropic scaffolds.
 - Studying cell migration depending on porosity of the scaffold.

August 2023 - May 2024 (CREDITS)

- ❖ Designed and fabricated Silicon wafers for scaffold polymerization in KLayout (GDSII editor) and Solidworks.
- ❖ Learned Cell Cultures, IF staining, PDMS/Si wafer protocol, and developing protocol for testing “stretch” in ECM samples.

Skills: Solidworks, KLayout, Cell Cultures (hDF, hiPSC, hMSC, CF), DNA assay, IF staining, Zeiss AxOb5 scope, R figures/stats, Mentorship, Experimental Design

Grant Funded Research Intern | UPMC Children’s Hospital of Pittsburgh

May, 2023 - August, 2023 (PAID)

Performed Kidney/Bladder/UTI research in the department of pediatrics and the department of nephrology through the SRIP (Student Research Internship Program) provided by UPMC Children’s Hospital of Pittsburgh, University of Pittsburgh, and a PHS Grant. Poster is on LinkedIn.

- ❖ Did small animal (rat) work including maintenance, gowning, sample collection, and asphyxiation.
- ❖ Paraffinized samples, microtomes, and performed IHC stains co-stains along with morphological stains (H&E).
- ❖ Developed a rudimentary cell counting neural network for IHC stains in my free time.

Award: Awarded a travel grant to ASN Kidney Week that totaled \$3000 as a result of my research in addition to membership in the American Society of Nephrology.

Skills: Laboratory Safety, IACUC Clearance, Immunohistochemistry, Microtomy, Hematoxylin & Eosin stains, Leica DMi8 scope, Small animal work (rat).

Emergency Room Clinical Volunteer | CHI St. Joseph Health

January - May, 2023

I volunteered at the St. Joseph Health E.R. in College Station. My tasks mainly consisted of turning over used rooms quickly, responding to patient needs (within my scope), and taking vitals when necessary.

Skills: Patient Care, Vital Signs, Communication

Store Associate | CVS Pharmacy

October, 2021 - February, 2022 (PAID)

Worked as a cashier and general store associate at my local CVS.

Skills: Customer service, Communication, Conflict Management

Education:

Bachelors of Science in BME | Texas A&M University College of Engineering (TAMU)

August 2022 - Present

Biomedical Engineering student within the Craig and Galen Brown Engineering Honors program through the President's Endowed and National Merit Recognition Scholarships.

- ❖ Medical Journaling at A&M (MJAM) - Vice President
- ❖ Korean-American Science and Engineering Association (KSEA), Biomedical Engineering Society (BMES), American Medical Student Association (AMSA)

GPA: 3.5 (unweighted) - 126 Credit Hours (Fall 2022 - Fall 2024 semesters)

High School Diploma | Pine-Richland High School (PRHS)

August 2018 - June 2022

- ❖ Varsity tennis team & Track and Field Starter
- ❖ Pittsburgh Youth Symphony Orchestra (Cello), High School Orchestra (Cello 1st chair), PMEA All State (Cello)
- ❖ Ski & Board Club (Officer), National Honors Society, Anatomy Club

GPA: 3.9 (unweighted) - 12 AP courses (AP Scholar with Distinction)

Awards:

Kidney STARS Travel Award | American Society of Nephrology (ASN) & NIDDK

November 2023

A travel stipend and complimentary attendance to 2023 ASN Kidney Week, the world's premier nephrology meeting.

President Endowed Scholarship | TAMU

August 2022

Merit based scholarship that offers a stipend for 4 years to high school seniors attending TAMU.

National Merit Recognition Scholarship | TAMU

July 2022

Scholarship recognizing national merit status that provides a stipend for four years

Non-resident Competitive Scholarship Tuition Waiver | TAMU

July 2022

A tuition waiver that allows competitive out-of-state students to pay in-state tuition.

Technology & Student Association Teams State Champions | PRHS

September 2021

Placed 1st in Pennsylvania and 3rd Nationally in a competitive engineering competition.

Projects:

Knockout muscarinic acetylcholine receptor subtype M3 in mice as a model for urothelial injury due to neurogenic bladder

May, 2023 - July, 2023 (PAID)

Objective: Characterize urothelial injury in Chrm3^{-/-} mice

- ❖ H&E and IHC stains were used for morphological and protein expression characterization, respectively.
- ❖ IHC utilized KRT5/14/20, UPK, and Ki67.

Crowd counting CNN model for counting cytoplasmic fluorescent stains

July, 2023 (personal)

Objective: Utilize CNN (Convolutional Neural Network) to count cytoplasmic IHC stains that current neural network cell counters struggle to process.

- ❖ For the general (cytoplasmic & nucleic) model MAE = 79.8 (n = 58) for cell counts of ~400 per image.
- ❖ Lower cell count images fared better: ie. an image with 62 cells had a prediction of 60 cells.

Personal Website - <https://jeffock.net>

August, 2024 - Present (personal)

Objective: Build a personal website from scratch (no holistic frameworks like React or Bootstrapping).

- ❖ Frontend: HTML5, CSS, vanilla JS
- ❖ Backend: batch script → local web-scraping server (Node.js) → PostgreSQL DB (via Supabase)
server-side request → CORS proxy (Heroku) → TS function (via Supabase) → PostgreSQL DB

Nourish App (Buildspace)

June, 2024 - Present (personal)

Objective: Provide a restaurant finding service with modern features and custom LLMs (Large Language Model) for those with dietary restrictions/preferences.

- ❖ Frontend: React Native, Typescript, Javascript, Kotlin, Swift
- ❖ Backend: Supabase, PostgreSQL, MongoDB

Note: Projects from my current lab are not mentioned for proprietary reasons

Relevant Coursework:

1st year:

August 2022 - May 2023

General Chemistry I/II (CHEM 119/120), General Biology I/II (BIOL 111/112), Calculus I-III (MATH 151/152/251), Computation (Python) (ENGR 102).

Transfer Credit: Programming I (CSCE 110), Newtonian Mechanics (PHYS 206), Intro to Psychology (PSYC 107), (BIOL 112/MATH 152)

2nd year:

August 2023 - May 2024

Human Physiology I/II (VTPP 434/435), E&M Physics (PHYS 207), Differential Equations (MATH 308), Organic Chemistry I/II (CHEM 227/237), Biostatistics (BMEN 250), Computing for BME (Solidworks/Python/Labview) (BMEN 207), Ethics & Fraud (2114400)

3rd year:

August 2024 - December 2024

Biotransport (fluids) (BMEN 341), Circuits, Signals, and Systems (BMEN 321), Biomedical & Health Data Science (BMEN 351), Biomechanics (BMEN 361).

4th year:

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Note: the above list is non-exhaustive and only includes some courses

Certifications:Working with Small Animals

CITI: May 2023 - May 2027
Credential ID: 55478167

Working with Mice in Research

CITI: May 2023 - May 2027
Credential ID: 55478160

Use of Controlled Substances in Basic and Animal Research

CITI: May 2023 - May 2027
Credential ID: 55970394

COI PHS Regulated Course

CITI: May 2023 - May 2027
Credential ID: 55478159

Responsible Conduct of Research

CITI: May 2023 - May 2027
Credential ID: 55478161

Bloodborne Pathogens for Lab Workers

CITI: May 2023 - May 2024
Credential ID: 55478169

Note: TAMU and University of Pittsburgh only certifications such as BSL 2 and Full Gowning are not mentioned.

Languages

Native/Bilingual proficiency in English and Korean.

SkillsLab Skills

Lab Safety, BSL 2, Small animal research, COI, Full gowning (fabrication), Lithography, Morphological stains (H&E), IHC stains, IF stains, Sectioning, Microscopy, Confocal, Cell culture (hDF, hMSC, hiPSC, CF, keratinocytes), Figure generation, Biostatistics, DNA assay, IACUC, Contact angle

Instruments

Leica DMI8, Zeiss AxOb5, Optical Tensiometer, Confocal IXM, Microtome, Centrifuge, pH Balance

Languages/Frameworks/Software

Solidworks, KLayout, Labview, Python, Java, R, Rust, Typescript, Javascript, HTML5, CSS3, React, SQLDB, PostgreSQL, Node.js, Kotlin, Swift, C#, Lua, Pytorch (CUDA), MatLab, Batch, Vim

Systems/Protocols/Services

CORS, CSP, TCP-IP, HTTP, Proxy servers, Heroku, Web Scraping, Supabase, Github Pages (hosting), DNS

Leadership/Misc

MJAM (Vice President), Research (Mentorship & Training), Research (Project Management)
