

# GEORGE SUN

georgemarksun@gmail.com

## EDUCATION

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**Yale University: School of Medicine** Aug. 2022 – Present

- Candidate for Doctor of Medicine degree, expected graduation May 2027 (anticipated dual-degree/research year)
- **Leadership:** Medical Student Counsel Representative for Class of 2026, Financial Aid Committee Representative for Class of 2026, Food Insecurity Student Taskforce, Service/Conference Chair for Asian Pacific American Medical Student Association (APAMSA)
- **Activities and societies:** HAVEN Free Clinic, Anatomy Teaching Program, OutPatient, Yale Medical Symphony Orchestra (YMSO), Curriculum Mapping & Integration Committee

**University of Washington, Seattle / B.S. in Bioengineering**, GPA: 3.85/4.0, *Magna Cum Laude* Sep. 2015 – Jun. 2019

- Thesis: “Real-Time Blood Clot Monitoring Using EkoSonic,” collaboration between UW Bioengineering & EKOS Corp. (now Boston Scientific)
- Engineering coursework: biomedical instrumentation, solid and gel mechanics, fluid mechanics, real-time signal processing and sensors, protein engineering, MATLAB, diagnostic/therapeutic ultrasound, microelectromechanical systems (MEMS)
- **Teaching Assistant** (Jan. – Mar. 2019): lab preparation, grading, and facilitating “Mass Transport and Systems” lab sessions

## RESEARCH EXPERIENCE

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**Research Fellowship / Yale Department of Neurosurgery, Dr. Eyiymisi Damisah** Jun. 2023 – Present

- Applied computational neuroscience research methods for analysis of intracranial electroencephalography (EEG) recordings during sleep to study correlations in slow wave sleep across regions of the human brain
- Research fellowship funded by National Institutes of Health-National Heart, Lung and Blood Institute

**Volunteer Research & Clinical / Swedish Neuroscience Institute:** Sep. 2019 – Present  
**Ben and Catherine Ivy Center for Advanced Brain Tumor Treatment, Dr. Charles Cobbs**

- Clinical observation and volunteering in outpatient clinic and operating room for neurological surgery
- Studied associations of herpes viruses and HPV with head/neck cancers and glioblastoma via PCR, immunoprecipitation, and mass spectrometry
- Optimized procedure for enriching and immunoprecipitating a low-abundance target protein
- Studied alternatively splicing in glioblastoma via Western blotting, immunohistochemistry, and mass spectrometry
- Developed process for fractionating protein lysates by size and digesting peptides for sequencing via mass spectrometry (GeLC-MS/MS)
- Developed a new web application for aligning peptide sequences and visualizing alternative splicing events from high-throughput (~15 million values) mass spectrometry data; manuscript in preparation

**Student Lab Technician / UW Medicine Dept. of Surgery: Center for Research in Education and Simulation Technologies (CREST)** Aug. 2018 – Sep. 2019

- Developed silicone-based synthetic tissue recipes and tested mechanical properties against human donor tissue
- Created high-fidelity breast, tongue, male bladder, and chest simulators for medical training
- Computer-aided design (CAD) parametric & surface modeling and 3D printing of molds for casting
- Created an operational rotational caster for molding hollow silicone lung simulators

## RESEARCH EXPERIENCE (CONTINUED)

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### Student Associate / CoMotion MakerSpace, University of Washington

Jun. 2016 – Sep. 2019

- Instructed clients on usage and safety for rapid prototyping software/equipment (e.g. computer-aided design, digital graphics, 3D printing, laser cutting, machining, wood shop, virtual reality, and textiles) used in various research and personal projects
- Maintained and repaired equipment, primarily for 3D printers and laser cutters, while minimizing downtime
- Trained new staff in facility procedures, equipment usage and repair
- Led tours and delivered instructional demonstrations of equipment to members from a wide variety of disciplines and age groups
- Identified areas for expansion and contributed to equipment acquisition through selection and grant application
- Implemented procedures with a focus on safe and fair usage of equipment in a shared space
- Designed safety signage and promotional flyers, managed social media presence

### Student Researcher / University of Washington Dept. of Bioengineering: Lab of Prof. Suzie Pun

Oct. 2016 – Jan. 2018

- Studied *in vivo* polymer-aided drug delivery transfection efficiency in mice assessed by fluorescent imaging
- Acquired skills for cell culture, flow cytometry, protein synthesis, mouse handling for *in vivo* studies

### Summer Research Intern / University of Washington Applied Physics Laboratory: Terahertz BioPhotonics Group with Dr. Hassan Arbab

Jun. 2016 – Aug. 2016

- Formulated chemical recipes for artificial tissue phantoms that mimic optical properties of tissue in the terahertz spectrum to refine technology for improving burn severity diagnosis
- Engineered laser cut acrylic tissue sample holders and molds to achieve uniform phantom thickness for multi-layer bulk tissue phantoms
- Developed process for manufacturing “microsprings” from monofilaments to model integumentary structures

### International Genetically Engineered Machine (iGEM) Competition

Oct. 2015 – Oct. 2017

- Engineered an autonomous control system for yeast cultures, using chemically-induced color changes (by gene engineering) detected via camera used to control bacterial growth by the addition of chemical inducers
- Manufactured 3D-printed syringe pump with robotics; facilitated trainings on computer-aided design & 3D printing

### Research Intern / Institute for Systems Biology, Seattle, WA: Proteomics Lab of Prof. Robert Moritz

Nov. 2012 – Sept. 2015

- Utilized RNA-sequence analysis and mass spectrometry for a more efficient and ethical approach to monoclonal antibody production that eliminates animal sacrifice (Award: *Intel Science Talent Search 2015 Semifinalist*)
- Optimized high-throughput mass spectrometer data analysis by developing Java scripts, accelerated process by hrs.
- Streamlined lab operations by developing with PHP an online inventory for chemical organization
- Identified protein biomarkers for breast cancer, tuberculosis, and prostate cancer using data analysis software

## PUBLICATIONS & PRESENTATIONS

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ORCID: 0000-0002-3879-6556

McEllin B, Searle BC, DePledge L, Sun GM, Cobbs CS, Karimi M. Detection of Human Papillomavirus Integration in Brain Metastases from Oropharyngeal Tumors by Targeted Sequencing. *Viruses*. 13(8), 1536 (2021).

“Real-Time Blood Clot Monitoring Using EkoSonic Endovascular System.” University of Washington Department of Bioengineering Capstone Symposium, 2019. (Presentation).

## PUBLICATIONS & PRESENTATIONS (CONTINUED)

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“Developing Terahertz-Mimicking Tissue Phantoms for Diagnosis of Burn Severity.” Washington Space Grant Consortium Summer Undergraduate Research Fellowship Annual Poster Reception, 2016. (Poster).

“Autonomous Control System for Yeast Cultures Using Violacein.” International Genetically Engineered Machine (iGEM) Giant Jamboree, 2016. (Poster).

## TECHNICAL SKILLS

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**SOFTWARE:** Autodesk Fusion 360/Inventor, Eagle, Adobe Illustrator, web development (HTML, CSS, JavaScript, PHP, SQL), LaTeX, MATLAB, LabView, COMSOL, Rhinoceros 3D

**MANUFACTURING:** FDM 3D printing (operation and repair), CO2 laser cutting (operation and maintenance), machining (CNC, milling, lathe), Arduino, Raspberry Pi, electronics, oscilloscopes, function generators, woodworking, mold making, silicone molding

**LAB:** tissue culture, cell counting, protein/nucleic acid extraction, gel electrophoresis, Western blot, polymerase chain reaction (PCR), immunohistochemistry (IHC), immunoprecipitation (IP), in-gel digestion for mass spectrometry (MS), transfection, flow cytometry, peptide synthesis, live animal research (mouse)

**PERSONAL:** violin/piano performance, repair of violin-family instruments, graphic design, gardening, home repair

## OUTREACH

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### Science Olympiad

Sep. 2011 – Present

- **Board of Directors** (Member, Jul. 2021 – Present; Chair, Jun. 2022 – Present; Secretary, Jul. 2021 – Jun. 2022), **Event Supervisor** (Mar. 2016 – Present), **Build Events Area Coordinator** (Dec. 2020 – Apr. 2021), **Tournament Director** (Sep. 2015 – Mar. 2019, Sept. 2021 – Jun. 2022) for **Washington Science Olympiad**
- **National Event Supervisor** (May 2017 – Present) and **Member** (Aug. 2016 – Present) of **Technology & Engineering Rules Committee**
- **Executive Planning Team** (Sep. 2021 – May 2022) for the **2022 National Tournament**
- Designed engineering challenges, produced curriculum and educational graphics for students and teachers
- Wrote tests and scored student engineering projects at various local and national tournaments
- Organized annual middle & high school tournaments (2015 – 2022) for 800 attendees, recruited and managed 80 volunteers, established partnerships with university departments, acquired funding and managed budget of \$7,000
- Founded local summer program (2015) allowing current high school participants to share interactive STEM activities with younger students

### Head Administrator / Scioly.org (Science Olympiad Student Center)

May 2015 – Present

- Oversaw team of 15 volunteer staff for a Science Olympiad community website with discussion forums, wiki, and test database used by over 30,000 students and coaches
- Implemented a multi-year site overhaul consisting of site redesign, rebranding, and server migrations
- Developed web applications and managed databases for a resource sharing platform, prediction contest, and archived discussion board
- Maintained relationships with partner organizations, managed social media presence
- Implemented site policies with a focus on ensuring free and public access to educational resources

### Campus Ambassador / Seattle Symphony

Sep. 2018 – Jun. 2019

- Publicized through flyers, social media, and word-of-mouth the Seattle Symphony’s “Campus Club” program, a low-cost ticket option for students in college

## AWARDS & HONORS

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<b>May 2022</b>	Science Olympiad Inc. National Volunteer of the Year
<b>Jun. 2019</b>	University of Washington, College of Engineering: <i>Magna Cum Laude</i> Honors
<b>Sep. 2015 – Jun. 2019</b>	Quarterly & Annual Dean's List (12 of 12 quarters)
<b>Sep. 2015 – Jun. 2019</b>	Herbold Foundation Scholarship
<b>Apr. 2018</b>	University of Washington Maker Summit: Laser Cutting Category Winner
<b>Jun. 2016 – Aug. 2016</b>	Washington Space Grant Consortium: Summer Undergraduate Research Program
<b>Jan. 2015</b>	Intel Science Talent Search Semifinalist