YOUNGJUN KWEON

ykweon0216@gmail.com | (858) 371-9360 | Sunnyvale, CA | LinkedIn | WEBSITE

CAREER PROFILE

Junior NanoEngineering student with 1+ year of hands-on Nano3 cleanroom experience fabricating graphene FET-based biosensors. TSMC-UCSD Academy member and Galiana Technology research intern; contributed to a GFET biosensing manuscript in review. Undergraduate researcher in two UCSD labs, building aptamer GFET hormone sensors and CdSe quantum-dot/graphene devices.

EDUCATION

University of California, San Diego | September 2024 – June 2028
B.S. in NanoEngineering, Department of Chemical and Nano Engineering | GPA: 3.636

- **Relevant Coursework**: Photolithography, Plasma Etching, Thin-Film Processing, Semiconductor Physics, Nanochemistry

TSMC-UCSD Academy | November 2026 – June 2027

- Selected as a top 8 students from 300+ applicants by TSMC and UCSD review committees for the 2026–2027 cohort.
- Training in the UCSD Nano3 cleanroom on industry-oriented semiconductor microfabrication processes and equipment.
- Following training, will lead a semiconductor process development project under the supervision of UCSD professors.

CLEANROOM EXPERIENCE

UCSD Nano3 Cleanroom User – GFET Fabrication | September 2025 – Present

- Applied SC-1 cleaning (DIW:NH4OH:H2O2 = 5:1:1) to remove organic contaminants and particles from (100) Si wafers.
- Spin-coated AZ1529 for oxide etch and LOR5B/AZ1518 bilayer resist for clean lift-off and graphene-safe resist stripping.
- Eliminated resist edge beads via a two-step spin recipe and edge-bead removal, improving coating uniformity and focus.
- Defined patterns using a Heidelberg maskless aligner at exposure doses of 250-350 mJ/cm2 tuned to the resist thickness.
- Deposited a Cr adhesion layer and Au contacts using a Temescal e-beam evaporator under high vacuum for metal lift-off.
- Deposited an amorphous SiO2 passivation layer using an Oxford Plasmalab PECVD with SiH4/N2O plasma chemistry.
- Etched SiO2 with Trion RIE (CF4/Ar), combining F-radical chemistry and RF ion bombardment for anisotropic profiles.
- Packaged functional GFET dies by wire bonding onto custom PCBs for electrical characterization and biosensing tests.
- Diagnosed fabrication failure modes by inspecting defects with optical microscopy and cross-checking electrical results.

RESEARCH/LAB EXPERIENCE

Research Intern – Galiana Technology | November 2026 – Present

- Supporting fabrication of Nanofids, a BCI device for detecting neuron activation, miniaturizing it to 20 µm and 1 µm.
- Developing a device architecture integrating a PV panel, quantum wells, and a calcium FET switch into a single device.
- Paid, industry-funded internship sponsored by Galiana Technology through the CMRR research center at UC San Diego.

Undergraduate Researcher – Biosensor Fabrication and Testing | Prof. Ratnesh Lal Lab | July 2025 – Present

- Ran aptamer-functionalized GFET biosensing for label-free estradiol and cortisol detection in PBS and artificial sweat.
- Evaluated sensor response using Dirac-point voltage shifts across hormone concentrations spanning the pM-nM range.
- Analyzed dose-response, sensitivity, repeatability, and selectivity vs. interfering steroid hormones using Python and Excel.
- Measured GFET transfer curves (Ids-Vgs) on a probe station by sweeping gate voltage and recording source-drain current.
- Wrote sections and prepared figures for a manuscript on GFET-based detection of estradiol and cortisol (under review).

Undergraduate Researcher – Materials and Optoelectronics | Prof. Oscar Vazquez Mena Lab | July 2025 – Present

- Fabricated CdSe quantum-dot structures for integration with graphene devices as an additional optical sensing modality.
- Tracked electrical changes after graphene transfer, annealing, QD deposition, and illumination to isolate process effects.
- Optimized graphene transfer (APS Cu etch), PMMA removal, and annealing to improve GFET response and repeatability.
- Performed photoluminescence on CdSe/graphene/biomolecule stacks to compare emission intensity across the interfaces.
- Designed GFET layouts and process flows: back gate, metal contacts, oxide passivation, and graphene channel definition.

TECHNICAL SKILLS

- **Cleanroom Tools:** Maskless Aligner, PECVD, RIE-ICP, ALD, E-Beam Evaporator, RTA, Surface Profiler, Wire Bonder
- **Fabrication:** Wafer Cleaning, Spin Coating, Lift-Off, Wet Etching, Graphene Transfer, KLayout, Process Flow Design
- **Characterization & Data:** Probe-Station I-V, Transfer Curves, Optical Microscopy, Photoluminescence, Python, Excel