

Karl Marquez

Scientist 3, Cell Therapy R&D · CAR-T · Data Analysis in R

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SUMMARY

Cell therapy scientist with 15 years in biotech and academic core labs, taking CAR-T and NK-cell programs from discovery through IND. Focused on donor-driven CAR-T biology, pairing functional assays, single-cell cytokine profiling and in vivo work with R-based analysis and dashboards. Co-inventor on two granted US patents.

EXPERIENCE

Genentech (Poseida Therapeutics, acquired January 2025) 2019–Present

Scientist 3 2025–Present

- Built a team-wide dashboard correlating donor characteristics with CAR-T production, in vitro and in vivo tumor-control data, making cross-study trends visible to anyone.
- Developed a serial restimulation assay measuring CAR-T killing and persistence under repeated tumor challenge.
- Profile single-cell cytokine responses of antigen-activated CAR-T cells and analyze them in R to link donor biology to product quality.
- Contributed to TARS immune cloaking, shielding allogeneic CAR-T cells from host NK killing to extend persistence.
- Improve post-thaw viability of CAR-T products, including antioxidant supplementation during manufacturing.

Research Scientist · Associate Scientist · Senior Research Associate · Research Associate 2019–2025

- Engineered and gene-edited T cells for CAR-T discovery and platform development, contributing to IND submissions for multiple programs, including anti-BCMA and anti-MUC1.
- Advanced the Healthy Donor Program for allogeneic CAR-T using cell separation, in vitro and in vivo characterization, and correlation and statistical analysis.

ImmunityBio (formerly NantKwest) 2017–2019

- Developed and optimized NK-cell isolation from PBMC and cord blood, scaling from bench to GMP-grade bioreactors.
- Demonstrated NK cytotoxicity across target cell lines and safety across healthy donors; work led to two granted patents.

Intrexon Corp. 2014–2017

- Optimized exosome purification from bovine milk and cell supernatant (ultracentrifugation, size-exclusion chromatography) and ran high-throughput bioactivity screens in human fibroblasts.

Stem Cell Core Facility, UC San Diego 2011–2014

- Ran and maintained flow cytometers and sorters for campus labs, purifying cell subsets from human, mouse and plant samples; supplied pluripotent hESC lines to UCSD researchers.

SKILLS

Cell therapy CAR-T and NK-cell engineering, gene editing (Cas-CLOVER), T/NK isolation, GMP-scale bioreactors, lab management
Assays Multicolor flow cytometry and sorting, serial restimulation and cytotoxicity assays, single-cell cytokine profiling, in vivo xenograft models
Data R (tidyverse, ggplot2, Shiny, pharmaverse), Python, statistics, data visualization, HTML/CSS/JS

PUBLICATIONS & PATENTS

Nat Commun 2025 Tseng H, Dholaria B, Cranert SA, Richter M, **Marquez K**, et al. *T_{SCM}-predominant allogeneic anti-BCMA CAR-T therapy for relapsed/refractory multiple myeloma: preclinical characterization and interim results from a phase 1 trial.* doi:10.1038/s41467-025-65267-0

Mol Ther Nucleic Acids 2022 Madison BB, Patil D, Richter M, ..., **Marquez K**, et al. *Cas-CLOVER is a novel high-fidelity nuclease for safe and robust generation of T_{SCM}-enriched allogeneic CAR-T cells.* doi:10.1016/j.omtn.2022.06.003

Patents Duggal R, Sinha R, Li W, Isaacson J, **Marquez K**, Soon-Shiong P. *Mononuclear cell derived NK cells.* US Patent 11,453,862 B2 (granted 2022) and US Patent 12,215,350 B2 (granted 2025); assigned to ImmunityBio.

SELECTED PROJECTS

Clinical Reporting (CDISC with pharmaverse in R) · COVID-19 Dashboard (R Shiny) · Vaccine Locator (R Shiny map of flu and COVID-19 shot sites)

EDUCATION

B.S., Molecular Biology
University of California, San Diego