

Carola Maturana, PhD

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Professional Profile

Results-driven Research Scientist with over 7 years of experience in gene therapy drug development, with a strong focus on assay validation, bioanalysis methods, and molecular mechanism studies. Possesses deep expertise in molecular and cell biology, protein biochemistry, mammalian cell culture, and gene editing technologies. Skilled in authoring SOPs, protocols, and technical reports to support technology transfer, regulatory submissions, and critical scientific milestones. Passionate about driving translational research in neurological, inflammatory, and ocular diseases through rigorous science and curiosity.

Experience

BioAgilytix SCIENTIST

Durham, NC
May 2025 – Present

- Conduct bioanalytical method development, validation, and sample analysis to support CMC, preclinical, and clinical studies for cell and gene therapy programs, ensuring compliance with GxP guidelines.

DIORASIS Therapeutics Inc RESEARCH SCIENTIST, R&D

Durham, NC
May 2024 – December 2024

- Developed and executed *in-vitro* assays supporting AAV gene therapy programs for glaucoma.
- Managed human primary cell and cell line cultures program, performing DNA/RNA extraction and transfection to support cell biology studies. Ensure reproducible results through effective task prioritization and adherence to quality standards, GLP.
- Implemented PCR, RT-PCR, qPCR, and ELISA techniques to analyze data, contributing to project success.
- Drafted SOPs and testing protocols, ensuring consistent and high-quality data collection.
- Collaborated effectively with cross-functional teams to ensure project timelines were met and deliverables were achieved.

IVIEW Therapeutics Inc. RESEARCH SCIENTIST, R&D

Cranbury, NJ
January 2023 – May 2024

- Designed, optimized, and validated in vitro potency and functional assays for AAV vectors for glaucoma, supporting preclinical development and regulatory documentation.
- Lead ocular and primary eye cell studies by conducting biodistribution, transgene expression, functionality, and viral shedding assessments to support gene therapy development.
- Organized and performed protein detection assays, including ELISA, flow cytometry, endotoxin assays, and immunofluorescence, to evaluate therapeutic protein expression and inflammatory markers.
- Contributed to method validation plans and drafted testing protocols and SOPs, ensuring robust data integrity.
 - Poster presentation in ASCGT Annual Meeting (2024)
 - International Patent Application (2024)

Princeton University ASSOCIATE RESEARCH SCHOLAR

Princeton, NJ
October 2021 – December 2022

- Developed and validated biophysical and biochemical assays for AAV expression cassette elements, optimizing transgene specificity and stability.
- Executed biochemical QC assays for AAV vector components and performed formulation/stability testing.
- Executed advanced histological techniques (cryostat/vibratome sectioning, IF, IHC, RNA/DNA FISH) to produce high-quality molecular and cellular data, driving experimental insights and supporting data-driven decisions in translational research and biotech-focused publications.
 - International Patent Application (2022)
 - Manuscript published in Gene Therapy (2023)

- Identified and validated neuronal promoters from the alphaherpesvirus genome by analyzing viral sequences (NGS assays) and testing promoter activity in neural systems, enhancing specificity and efficacy of transgene expression.
- Cultured primary neuron cells and cell lines, performing retro-orbital injections in mice/rats, intravitreal, intravenous, intramuscular injection, anesthesia, perfusion and dissection.
- Applied strong analytical skills in data processing using GraphPad Prism, SnapGene, Transfac, FIJI and QuPath imaging software driving insight generation from high-dimensional experimental datasets.
- Characterized alphaherpesvirus reactivation mechanisms in PRV and HSV through molecular and cellular assays, contributing to the understanding of viral latency and reactivation.
 - International Patent Application (2020)
 - Poster presentation at ASCGT Annual Meeting (2022)
 - Manuscripts published in Molecular Therapy-Methods & Clinical Development (2020), Gene Therapy (2021, Editor's Choice for May 2023 cover), Current Protocols (2022), Journal of Virological Methods (2023), Frontiers in Virology (2024)

Education

PhD in Physiological Sciences, *Pontificia Universidad Catolica de Chile*

Master in Biological Sciences, *Pontificia Universidad Catolica de Chile*

Master in Neuroscience, *Universidad de Valparaiso, Chile*

Bachelor in Biochemistry, *Universidad Austral de Chile*

Selected Publications

- **Maturana, C. J.** & Engel E.A. (2024). Persistent transgene expression in peripheral tissues one year post intravenous and intramuscular administration of AAV vectors containing the alphaherpesvirus latency-associated promoter 2. [Frontiers in Virology](#)
- **Maturana, C. J.**, (2023). Engineered compact pan-neuronal promoter from Alphaherpesvirus LAP2 enhances target gene expression in the mouse brain and reduces tropism in the liver. [Gene Therapy](#)
- **Maturana, C. J.**, Chan, A., Verpeut, J. L., & Engel E. A. (2023). Local and systemic administration of AAV vectors with alphaherpesvirus latency-associated promoter 2 drives potent transgene expression in mouse liver, kidney, and skeletal muscle. [Journal of Virological Methods](#)
- Chan, A., **Maturana, C. J.**, & Engel, E. A. (2022). Optimized formulation buffer preserves Adeno-associated virus-9 infectivity after 4°C storage and freeze/thawing cycling. [Journal of Virology Methods](#)
- **Maturana, C. J.**, Verpeut, J. L., & Engel, E. A. (2022). Single-Cell Quantification of Triple-AAV Vectors Genome Coexpressed in Neurons. [Current Protocols](#)
- **Maturana, C. J.**, Verpeut, J. L., Kooshkbaghi, M., & Engel E. A. (2021). Novel tool to quantify with single-cell resolution the number of incoming AAV genomes co-expressing in the mouse nervous system. [Gene Therapy](#)
- Laval, K., **Maturana, C. J.**, & Enquist, L. W. (2020). Mouse Footpad Inoculation Model to Study Viral-Induced Neuroinflammatory Responses. [JoVE \(Journal of Visualized Experiments\)](#)
- **Maturana, C. J.**, Verpeut, J. L., Pisano, T. J., Dhanerawala, Z. M., Esteves, A., Enquist, L. W., & Engel, E. A. (2020). Small Alphaherpesvirus Latency-Associated Promoters Drive Efficient and Long-Term Transgene Expression in The Central Nervous System. [Molecular Therapy-Methods & Clinical Development](#)

Patents

- Borrás, T., Hong, G., Liang, B., Wu, L., & **Maturana, C. J.** (2024). Self-complementary AAV vectors carrying dominant negative RhoA and methods of use to treat ocular diseases. Patent Application No. [PCT/US2023/074351](#)
- **Maturana, C.J.** & Engel, E. A. (2022). Compositions and methods for cell-specific expression of target genes. Patent Application No. [PCT/US2022/080438](#)
- Engel, E. A., **Maturana, C.J.**, & Enquist, L.W. (2020). Adeno-associated viral vectors containing alphaherpesvirus promoter sequences. International Patent Application No. [PCT/US2020/016787](#)
- Sáez, J. C., Lagos, C., & **Maturana, C.J.** (2018). Selective connexin hemichannels blockers for the treatment of epilepsy. U.S. Patent Application No. [US15/556,205](#)