CAROLA MATURANA

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PROFESSIONAL PROFILE

Research Scientist specializing in AAV gene therapy with 6+ years of experience. Skilled in experiment design, data analysis, and interdisciplinary collaboration. Proficient in AAV vectors, transgene cassette engineering, and in vitro/in vivo characterization. Expertise includes molecular and cellular biology, biochemical assays, anesthesia and animal surgery, tissue culture, histology, and microscopy.

- AAV vector production, purification, and validation
- AAV viral vector design and Titer measurement
- Primary cell culture and cell line
- Design *in vivo* preclinical studies
- Behavioral assays in animal models
- Molecular biology and imaging software

PROFESSIONAL EXPERIENCE

RESEARCH SCIENTIST, R&D January 2023 – Present
IVIEW Therapeutics Inc. Cranbury, NJ

- Developed and conducted *in vitro* and *ex vivo* translational assays to support AAV gene therapy programs in glaucoma. Primary cell culture and human eye tissue models. DNA, RNA, and protein extraction, RT-PCR, qPCR, ELISA, Titer and endotoxin kit, immunofluorescence (IF)
- Validated biodistribution and AAV transduction efficacy assay using ELISA method for ROCK activity assay
- Contribute to method validation plan, and drafting testing protocol and standard operating procedure (SOP)
  - International Patent Application, 2024
  - Poster presentation in ASCGT Annual Meeting, 2024

ASSOCIATE RESEARCH SCHOLAR October 2021 – December 2022
PRINCETON UNIVERSITY Princeton, NJ

- Developed and validated AAV expression cassette elements to enhance transgene target specificity and expression in gene therapy by TRANSFAC, JASPAR, and Snapgene software, SCG neuron primary cell, N2A and HEK293T cells culture, retro-orbital and intravitreal injection in mouse, IF, immunohistochemistry (IHC), RNA/DNA In Situ Hybridization (FISH)
  - International Patent Application, 2022
  - Manuscript published in Gene Therapy, 2023

POSTDOCTORAL RESEARCH ASSOCIATE October 2017 – September 2021
PRINCETON UNIVERSITY Princeton, NJ

- Identified and validated neuronal promoters from the alphaherpesvirus genome using SCG neuron primary cell and HEK293T cells culture, retro-orbital injection in mouse/rat, IF, FISH
  - International Patent Application, 2020
  - Manuscript published in Molecular Therapy-Methods & Clinical Development, 2020
- Validated transgene expression and vector biodistribution of AAV-LAP2 promoter in peripheral organs by PK15, HepG2, HEK293T cells culture, intravenous and intramuscular injection in mouse, qPCR, IHC, IF, FISH
  - Poster presentation in ASCGT Annual Meeting, 2022
  - Two manuscripts, one manuscript published in Journal of Virological Methods, 2023 and second manuscript in Frontiers in Virology, 2024
- Developed a single-cell AAV genome quantification assay with a mathematical model using AAV transduction in SCG neuron primary cells culture, stereotactic injection, IF, FIJI and QuPhat imaging software
  - Two manuscripts, one manuscript published in Gene Therapy in 2021, was chosen as the Editor's Choice for the cover of the journal's May 2023 issue and second manuscript published in Current Protocols, 2022

- Characterized alphaherpesvirus reactivation mechanisms in PRV and HSV by SCG neuron primary cell, PK15 and HEK293T cells culture, Titer measurement, Western Blot, qPCR

RESEARCHER ASSISTANT October 2016 – September 2017
COLORADO STATE UNIVERSITY Fort Collins, CO

- Validated a Radioimmunoassay (RIA) to detect hypothalamic regions targeted by negative seasonal feedback of estradiol on kisspeptin production in sheep
- Validated biomarkers for IHC assays for *in vitro* diagnostics of brain samples and optimized imaging conditions for high-throughput fluorescence and light microscopy of samples

EDUCATION

PhD in PHYSIOLOGICAL SCIENCES. Pontificia Universidad Catolica de Chile. Chile
Master in BIOLOGICAL SCIENCES. Pontificia Universidad Catolica de Chile. Chile
Master in NEUROSCIENCE. Universidad de Valparaiso. Chile
Bachelor in BIOCHEMISTRY. Universidad Austral de Chile. 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

- Borras, 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