Charlie Bayne

@ chbayne@health.ucsd.edu | 540-308-0528 | charlie-bayne-73358565 | github.com/baynec2

EDUCATION

Biomedical Sciences PhD Graduate Student — La Jolla, CA | Sep 2021 - Present
University of California San Diego

BS Biochemistry and Molecular Biology — Carlisle, PA | Sep 2011 - 2015
Dickinson College
magna cum laude, Recipient of the David A. Baram Prize for Excellence in Molecular Biology

WORK EXPERIENCE

KALEIDO BIOSCIENCES | Senior Research Associate — Lexington, MA | October 2020 – August 2021
Research Associate II — September 2018 – October 2020
Research Associate — September 2016 – September 2018

Served as a critical team member of research projects aimed at identifying and developing novel therapeutics to modulate the microbiome to treat various diseases. Conceived of and established great advances to Kaleido's *in vitro* screening platform that allowed for higher throughput data collection and increased depth and quality.

- Collaborated with a group of multidisciplinary scientists to design and execute experimental plans for emerging indication areas.
- Adapted knowledge and techniques such as flow cytometry from the literature to allow for targeted investigation of the microbiome.
- Used R and Tableau to analyze and report the results from large multidimensional data-sets associated with shallow shotgun sequencing, 16S rRNA sequencing, kinetic plate reader data, among others.
- Developed an assay and corresponding R package to allow for the high-throughput capture, curve modeling, feature extraction, and analysis of kinetic pH and OD600 data obtained from *in vitro* testing of Kaleido's compounds.
- Performed Next-Generation Sequencing by taking samples from DNA extraction to 16S rRNA gene sequencing using the Illumina Miseq platform.
- Organized research meetings for the Biology department.

UNIVERSITY OF VIRGINIA | Laboratory Technician II — Charlottesville, VA | June 2015 - June 2016
Studied the molecular mechanisms responsible for *Chlamydia trachomatis* pathogenesis in eukaryotic host cells as a member of the Derré lab.

- Conducted a high content microscopy screen designed to identify host genes necessary for the transition from RB to EB in the developmental cycle of *Chlamydia trachomatis*.
- Supported two publications with experimental work.

PUBLICATIONS

1. Millet, Y. A., Meisner, J.; Tan, J., Jose, A., Humphries, E., Miller, K. J., **Bayne, C.**, McComb, M., Giuggio, M., Konopnicki, C. M., Belanger, D. B., Li, L., Yuan, H, Rosini, M., Luong, H., Martin, J., Pan, Z., Kahn, C. R., van Hylckama Vlieg, J. (2022) Modulation of the Gut Microbiome by Novel Synthetic Glycans for the Production of Propionate and the Reduction of Cardiometabolic Risk Factors; preprint; Microbiology. https://doi.org/10.1101/2022.04.04.487010.

2. Tolonen, A., Beauchemin, N., **Bayne C.**, Tan, J., Meehan, B., Meisner J., Millet, Y., Lingyao ,L., LeBlanc, G., Lee, J., Murphy, C.,Turnbaugh P., von Maltzahn, G.,Liu C.,van Hylckama Vlieg, J. (2022). Synthetic glycans that control gut microbiome structure mitigate colitis in mice. Nature Communications 13,1244. https://doi.org/10.1038/s41467-022-28856-x

3. Cortina, M. E., Ende, R. J., Clayton Bishop, R., **Bayne, C.**, Derré, I. (2019). Chlamydia trachomatis and Chlamydia muridarum spectinomycin resistant vectors and a transcriptional fluorescent reporter to monitor conversion from replicative to infectious bacteria. PLoS ONE, 14(6). https://doi.org/10.1371/journal.pone.0217753

4. **Bayne, C.** F., Widawski, M. E., Gao, F., Masab, M. H., Chattopadhyay, M., Murawski, A. M., … Kushner, D. B. (2018). SELEX and SHAPE reveal that sequence motifs and an extended hairpin in the 5' portion of Turnip crinkle virus

satellite RNA C mediate fitness in plants. Virology, 520. https://doi.org/10.1016/j.virol.2018.05.010

5. Stanhope R., Flora, E., **Bayne, C.**, Derré, I. (2017). IncV, a FFAT motif-containing Chlamydia protein, tethers the endoplasmic reticulum to the pathogen-containing vacuole. Proceedings of the National Academy of Sciences of the United States of America, 114(45). https://doi.org/10.1073/pnas.1709060114

POSTERS

1. Liu C., Yatsunenko T., Jose A., Mahowald M., Beauchemin N., **Bayne C.**, Konopnicki C., Rock J., Li L., Pruyne J. Chemical Modulation of the Gut Microbiome Alleviates Chemotherapy-Induced Toxicity. Presented at Keystone Microbiome: Therapeutic Implications, 2019

2. **Bayne C.**, Jose A., Yatsunenko T., Conrad M., Konopnicki C., Leff J., Tan J., Beauchemin N. High-throughput *in vitro* system to test compound effects on the human microbiome. Presented at Beneficial Microbes Conference, 2018

SKILLS

Laboratory Techniques: Assay Development, Next Generation Sequencing, Nanopore Sequencing, Flow Cytometry, qPCR, Colorimetric Assays, Anaerobic Microbiology, Molecular Biology / Cloning, Tissue Culture, High Content Microscopy
Technology: R Programming, Tableau, Gen5, Snapgene, BLAST , Sapio LIMS, Git, FlowJo, LaTeX