

CHARLIE BAYNE

Creative and analytical biologist looking to take the next steps on his scientific journey

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RESEARCH EXPERIENCE

Kaleido Biosciences, Inc

Senior Research Associate, Biology (July 2020 - Present)

Research Associate II, Biology (September 2018 - July 2020)

Research Associate I, Biology (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 the experimental plan for an emerging indication area.
- 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.
- Took samples from DNA extraction to 16S rRNA gene sequencing using the Illumina Miseq platform.
- Organized research meetings for the Biology department.

University of Virginia, Department of Microbiology

Laboratory Technician II (July 2015 - July 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.

Dickinson College, Biology Department

Independent Student Research (September 2014 - May 2015)

Studied the structure/function relationship of turnip crinkle virus associated satC.

EDUCATION

BS Biochemistry and Molecular Biology

Dickinson College

📅 2011 - 2015

📍 Carlisle, PA

GPA = 3.79, *magna cum laude*

SKILLS

Assay Development	Next Generation Sequencing	Flow Cytometry	qPCR	Colorimetric Assays
Anaerobic Microbiology	Laboratory Automation	Molecular Biology / Cloning	Tissue Culture	
High Content Microscopy				
R Programming	Tableau	Gen5	Snapgene	BLAST
Git	FlowJo	Sapio LIMS	Microsoft Office	

TRAINING

- **Data Science Specialization.** Series of 10 courses offered by Johns Hopkins University through Coursera focusing on using R as a tool to conduct data analysis.
- **Introduction to i-Series and Method Programming Course.** Week long training course at Beckman Coulter headquarters.

PUBLICATIONS

1. 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>
2. **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>
3. 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>

PUBLICATION IN PROGRESS

1. 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. (2020). Synthetic glycans that control gut microbiome structure mitigate colitis in mice. Manuscript submitted to Nature Biotechnology for publication.

POSTERS

1. Liu C., Yatsunenko T., Jose A., Mahowald M., Beauchemin N., **Bayne C.**, Konopnicki C., Rock J., Li L., Pruyn 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