

PATRICK CHERRY

✉ pcherry [at] pm dot me | 📞 upon request | 🏢 Senior Scientist | Genomics | 🏠 Twist Bioscience | 📍 San Francisco, California |
🌐 pdcherry.github.io | 🐙 github.com/pdcherry | in [linkedin.com/in/p-cherry](https://www.linkedin.com/in/p-cherry) | 🇺🇸 United States Citizen | Updated on 2024-07-01

PhD scientist and professional critical thinker, problem-solver, and science communicator. At the interface of data science, genomics, and statistics; skilled at data visualization, bioinformatics, next-generation sequencing (NGS), and tool-building. I've coded reproducible pipelines for high-throughput experimental designs and genomic analyses. I've launched best-in-class oncology reference standards and analyzed NGS data from Illumina, MGI, and Element. Originally trained in Molecular Biology, I am passionate about advancing data science and bioinformatics to improve human health and to understand biology.

🎓 EDUCATION



- May 2019
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Aug 2013
- **PhD**
University of Colorado School of Medicine 📍 Aurora/Denver, Colorado
 - Ph.D. in Molecular Biology. Advisor: Jay Hesselberth, PhD
 - Thesis: RNA terminus chemistry impact decay events that target *HAC1* mRNA during the Unfolded Protein Response
 - **BA**
Hendrix College 📍 Conway, Arkansas
 - Biochemistry and Molecular Biology, with Distinction. Advisor: Andres Caro, PhD
 - Senior Capstone Project showing key stress response gene expression changes to oxidative stress in liver cells
 - Minor in Mathematics; PI: Lars Seme; Project: Newton's method as a fractal chaotic dynamical system

🏢 INDUSTRY EXPERIENCE

- Apr 2024
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Nov 2021
- **Senior Scientist, Genomics**
Twist Bioscience 📍 South San Francisco, California
 - Invented and introduced multiple new products to market yielding \$1M+ in new revenue as *Tech Lead*, including: *Pan-cancer cfDNA* (v1 & v2), *CNV Controls*, *RNA Fusion Controls*, *Fragmentome Controls*, and RNA-seq
 - Answered biological and business questions with **DoE** and data analysis using R and the libraries: dplyr, dbplyr, DBI, purrr, ggplot2, Bioconductor, **DEseq2**, **seurat**, **tidymodels**, glm, nls, lme4, **AlgDesign**, and more
 - Edited and maintained production QC pipelines with automated reporting using Python and the libraries: NumPy, pandas, polars, seaborn, statsmodels, biopython, pybedtools, pysam, vcfpy, scanpy, and others
 - Maintained production code (git version control with code review) with CD (github actions); operated in high-performance compute environment aws s3 and Databricks using Unix shell / bash tools, like STAR-fusion
 - Authored internal R package "**twistcolorpal**" on Github with help files to help scientists style plots to Twist branding
 - **Scientist, Genomics**
Twist Bioscience 📍 South San Francisco, California
 - Tech Lead of Nov. 2021 launch of Twist *Pan-Cancer Reference Standard*, an ISO-13485 synthetic control with 458 variants among 84 cancer-associated genes at six QC'd VAFs, plus a WT control, earning +\$1M in revenue in year 1
 - Identified and optimized compatible ddPCR assays using web scraping in R with rvest for cfDNA quality control
 - Used Python to author automated data / QC reports using Jinja2 (with CSS) and WeasyPrint, documented on Jira
 - Managed data and ran bioinformatic analyses on Illumina RNA & DNA seq using bash tools like: awk, grep, wget, ssh, GATK, BaseSpace CLI, bwa, bedtools, samtools, vcftools, UMI-tools/fgbio; Confluence documentation
 - Wrote original SQL queries for Snowflake-based database to answer production and business questions.
 - **Scientist I, NGS Core & Strain-Build Process Development**
Zymergen, Inc. 📍 Emeryville, California
 - Boosted *NGS Core* genotyping success by 45% using DoE experimentation, data-driven decision-making, and teaching; Guided demanding and diverse internal customers on complex NGS experiments
 - Built and disseminated Rmarkdown notebook for autonomous NGS data exploration
 - Coded plasmid and strain build and QC experiments using Zymergen's alembic Python API to LIMS database
 - Rendered strain build and plasmid build reports from LIMS SQL database in MySQL Workbench







SELECTED INTELLECTUAL PROPERTY

- Apr 2021 • **Libraries for mutational analysis**
Twist Bioscience  South San Francisco, California
- US Prov. Pat. Ref No 823.101
 - Configuration and fabrication of synthetic DNA & RNA reference standards and synthetic variant sequences
- Mar 2021 • **Method for counterselection in microorganisms**
Zymergen, Inc.  Emeryville, California
- US 2021_0087586 A1
 - Demonstration of novel counterselection mechanism in non-model *Bacillus* microbe for genetic modification










SELECTED PUBLICATIONS

- Jan 2024 • **Twist cfDNA Pan-Cancer Reference Standard v2 Technical Guidance**
Twist Bioscience [Product Sheet](#) & [FAQ](#)  South San Francisco, California
- Patrick Cherry, Lydia Bonar, & Mike Bocek
- Apr 2022 • **Characteristics and specificity of the wild-type / 0% VAF reference material**
Twist Bioscience  South San Francisco, California
- Patrick Cherry & Mike Bocek
- Mar 2019 • **Multiple decay events target HAC1 mRNA during splicing to regulate the unfolded protein response**
[eLife](#)  Aurora/Denver, Colorado
- Cherry, P., Peach, S., & Hesselberth, J.
- Dec 2017 • **Genetic bypass of essential RNA repair enzymes in budding yeast**
[RNA](#)  Aurora/Denver, Colorado
- Cherry, P., White, L., York, K., & Hesselberth, J.



SELECTED PRESENTATIONS & TALKS

- Feb 2024 • **Twist pan-cancer reference standard V2: Enhanced precision and reduced errors in ctDNA analysis**
[Advances in Genome Biology and Technology](#)  Orlando, Florida
- Apr 2023 • **Twist pan-cancer synthetic RNA fusion control for assay development**
[American Association for Cancer Researchers](#), [Twist Bioscience](#)  Orlando, Florida
- Feb 2023 • **Use of synthetic CNV fragments to mimic copy number alterations for ctDNA reference standards**
[Advances in Genome Biology and Technology](#)  Hollywood, Florida
- Apr 2022 • **Twist pan-cancer synthetic reference materials for cell-free DNA (cfDNA) assay development**
[American Association for Cancer Researchers](#)  New Orleans, Louisiana
- Jun 2020 • **R use at Zymergen**
Z-Tech Talk  Emeryville, CA
- Apr 2020 • **Data-driven troubleshooting of NGS experiments**
Data Science Talk  Emeryville, CA
- Aug 2017 • **RNA processing regulates the unfolded protein response**
CSHL: mRNA Processing Meeting Talk  Cold Spring Harbor, New York