

PATRICK CHERRY, PHD

✉ pcherry [at] pm dot me | 📞 upon request | 🏢 Senior Scientist | Oncology | 🏠 BillionToOne | 📍 San Francisco, California |
🌐 pdcherry.github.io | 🐙 github.com/pdcherry | in linkedin.com/in/p-cherry | 🇺🇸 United States Citizen | Updated on 2024-12-20

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.

🏢 INDUSTRY EXPERIENCE

Current
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Sep 2024

● Senior Scientist, Oncology

BillionToOne

📍 Menlo Park, CA

- Generated 500+ automated ddPCR primer / probe designs with pipeline in snakemake using s3 database of variant data and primer3 primer selection
- Informed key product decisions with historical analyses using PostgreSQL / ssh and s3 data sources and linear mixed-effects modeling

Apr 2024
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Jan 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*, RNA-seq, and primer / adapter removal methods for highly-multiplexed dsDNA pools
- 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, Jinja2 (with CSS), WeasyPrint, 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 ssh, STAR-fusion, GATK, BaseSpace CLI, bwa, bedtools, samtools, vcftools, UMI-tools/fgbio; Confluence documentation
- Authored internal R package "[twistcolorpal](#)" on Github with help files to help scientists style plots to Twist branding
- Answered production and business questions with original SQL queries for Snowflake-based database

Jan 2021
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Apr 2019

● 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 and JMP statistical templates 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

🎓 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

May 2013
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Aug 2009

● 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







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](#), Twist Bioscience  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](#), Twist Bioscience  Hollywood, Florida
- Apr 2022 • **Twist pan-cancer synthetic reference materials for cell-free DNA (cfDNA) assay development**
[American Association for Cancer Researchers](#), Twist Bioscience  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