PATRICK CHERRY, PHD

pcherry [at] pm dot me | upon request | Senior Scientist | Oncology | BillionToOne | San Francisco, California |
pdcherry.github.io | github.com/pdcherry | linkedin.com/in/p-cherry | United States Citizen | Updated on 2025-07-23

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 am passionate about advancing data science and bioinformatics to improve human health and to understand biology.

INDUSTRY EXPERIENCE

Current | Sep 2024

Senior Scientist, Oncology

BillionToOne, Inc. — Menlo Park, California

- Ideated, coded, and validated patented method for tumor fraction estimation from plasma aneuploidy data using Gaussian mixture models (`mclust`), custom model selection metric, and custom consensus logic.
- Designed and implemented multiplexed amplicon NGS assay with `Bioconductor` NCBI tools and `primer3` primer selection; generated 500+ automated ddPCR designs with pipeline in `snakemake` using `s3` database of variant data.
- Wrote custom Nextflow pipeline for RNA-seq data analysis with automated quality control reporting.
- Informed key product decisions with analyses using PostgreSQL and s3 data sources and linear mixed-effects modeling
- Influenced leadership with internal research reports on Notion written in Quarto with reproducible Python and R code.
- Hired four Research Associates; managed the Statistics interview and collaborated in Roundtable hiring decisions.

Apr 2024 | Dec 2021

Senior Scientist, Genomics

Twist Bioscience, Inc. — 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 adapter removal
- 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
- Wrote and published reports in Rmarkdown and LaTeX. Edited and maintained production QC pipelines with automated reporting using `Python` and the libraries: `NumPy`, `pandas`, `polars`, `seaborn`, `statsmodels`, `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
- Answered production and business questions with original `SQL` queries for `Snowflake`-based database

Jan 2021 | 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` and R / `ggplot`

EDUCATION

Apr 2019 | Aug 2013

PhD in Molecular Biology

University of Colorado School of Medicine — Aurora/Denver, Colorado

- Ph.D. in Molecular Biology. Advisor: Jay Hesselberth, PhD
- Thesis: RNA terminus chemistry potentiates decay events targeting *HAC1* mRNA during the Unfolded Protein Response
- Key courses: BIOS 6606 Statistics; MOLB 7621 Genome Analysis Workshop.

May 2013 | Aug 2009

BA in Molecular Biology with Distinction, minor in Mathematics
Hendrix College — Conway, Arkansas

- Senior Capstone Project showing changes of key stress response gene expression to oxidative stress in liver cells
- Key courses: Probability & Statistics; Discrete Mathematics; Adv Biological Chemistry, Analytical Chemistry

SELECTED INTELLECTUAL PROPERTY

Jan 2025

Liquid biopsy assay for genomic profiling of circulating tumor DNA
BillionToOne, Inc. — Menlo Park, California

- US Patent Application 19/033,133
- Invention of tumor fraction estimation / in-tissue copy number estimation from aneuploidy signal in plasma

Apr 2021

Libraries for mutational analysis
Twist Bioscience — South San Francisco, California

- Worldwide Patent WO2024073708A1
- Configuration and fabrication of synthetic DNA & RNA reference standards and synthetic variant sequences

Mar 2021

Method for counterselection in microorganisms
Zymergen, Inc. — Emeryville, California

- Worldwide Patent WO2021061694A1 / 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

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

Apr 2025

Tumor fraction estimation and tissue copy number inference using copy number signal from liquid biopsy
American Association for Cancer Researchers — Chicago, Illinois

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