

PATRICK CHERRY

PhD scientist skilled in bioinformatics, biological data science, data visualization, statistical modeling, next-generation sequencing (NGS), and tool-building. I've coded reproducible and rigorous pipelines for high-throughput experimental designs and genomic analyses, launched best-in-class oncology reference standards, and invented new molecular methods for DNA and microbe manipulation. Originally trained in Molecular Biology, I'm interested in taking my knowledge and practice of data science / bioinformatics to the next level, especially on spatial and single cell data analysis.

EDUCATION

2019
|
2013

PhD

University of Colorado School of Medicine


 Aurora/Denver, Colorado

- Ph.D. in Molecular Biology
- Advisor: Jay Hesselberth, PhD.
- Thesis: RNA Terminus chemistry affects the decay events that target HAC1 mRNA during the Unfolded Protein Response

2013
|
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

INDUSTRY EXPERIENCE

Current
|
2022








Senior Scientist

Twist Bioscience

 South San Francisco, California

- Tech Lead of multiple reference control NPIs, custom OEMs, and commercial releases. Includes the *Pan-cancer RNA Fusion Controls*, *Fragmentome Calibration Controls*, *CNV Controls*, *Pan-cancer cfDNA v2*, and RNA-seq.
- Mentored a direct report from Senior Research Associate to Scientist to serving as a Tech Lead on new product introductions
- Original research led to multiple outside presentations and applications for patent protection of product configuration and biochemical methods.
- Custom data analysis pipeline in R and Python demonstrated proof-of-concept design and QC success of the Pan-cancer RNA Fusion Controls; designed and implemented the production approach; used public databases and feedback from alpha testers to design configuration of fusions RNAs
- Led new technology evaluation of a new NGS platform with custom experiments and bioinformatic analyses in Python, R, and SQL to enable faster gene QC in Production. Also led ancillary experiments to speed up synthetic gene production. Coded, implemented, and distributed on company GitHub an internal package, *twistcolorpal*, that automatically adds Twist-brand colors to ggplot2 plots and sets up database connectors to SQL / Snowflake for parameterized dbplyr querying. Regularly use R, tidyverse, Python, Polars, AWS s3, Spark, PySpark, and SparkLyr, locally and on Databricks.

CONTACT

 pcherry [at] pm.me
 upon request
 Senior Scientist | Genomics
 Twist Bioscience
 San Francisco, California
 github.com/pdcherry
 linkedin.com/in/p-cherry

I currently split my time between wet lab and computational activities. I have worked in a variety of roles ranging from HTP strain onboarding to genomics scientist. I like collaborative environments where I can learn from my peers and in turn teach others.

Last updated on 2023-12-27.

*Data-driven résumé made in R using
pagedown.*

Current
|
2021



Scientist

Twist Bioscience

📍 South San Francisco, California

- Tech Lead of *Pan-Cancer Reference Standard*, an ISO-13485 synthetic positive control with 458 unique variants among 84 cancer-associated genes at six QC'd VAFs, plus a WT control, which launched in Nov of 2021
- Designed, implemented, & validated primer removal procedure for DNA standards *that is compatible with methylation*
- Devised and validated precise high-throughput DNA quantification process for accurate pooling
- Led multiple iterations of custom NGS analysis refined the QC approach and thresholds for ensuring a contamination-free production process; extensively used data visualization to communicate complex data to cross-functional collaboration teams.
- Made extensive use of UMI sequencing and created novel method to rigorously quantify library conversion efficiency to evaluate product and potential secondary sources

2021
|
2019



Scientist I

Zymergen, Inc.

📍 Emeryville, California

- Designed and implemented an automated high-throughput genotyping assay
- Designed & carried out complex experiments on automation with and without LIMS sample tracking
- Supported a company-wide NGS core under high demand from diverse groups with complex needs using data-driven decision making and teaching
- Used statistical methods to screen and optimize a genetic engineering protocol for newly-on-boarded microbe; delivered robust process while working on New Product Introduction team
- Built hundreds of plasmids using modern molecular cloning techniques like Gibson and Golden Gate



RESEARCH EXPERIENCE

2019
|
2014



Doctoral Research

University of Colorado School of Medicine

📍 Aurora/Denver, Colorado

- Wrote, revised, & published two academic papers on RNA repair & yeast genetics
- Engineered and characterized genetic bypass of essential genes in budding yeast; on-boarded CRISPR/Cas9 for efficient and precise gene knock-in
- Expressed, purified, and used wild-type and mutant recombinant protein in *E. coli* to carry out an RNA modification enzymatic assay
- Optimized custom RNA-seq library protocol; independently planned, executed, troubleshooted RNA modification detection
- Routinely conducted northern blotting, targeted depletion, primer extension, splinted ligation, and other esoteric DNA and RNA experiments

I worked on a few projects during my PhD, and the RNA repair project led me to custom 5'-OH RNA-seq libraries, which inspired my fascination with transcriptomics and bioinformatics.



INTELLECTUAL PROPERTY

3/7/23



Methylation-mediated adapter removal on nucleic acid sequences

Twist Bioscience

📍 South San Francisco, California

- US 63/317,466

11/12/21



Expansion of cfDNA for Libraries

Twist Bioscience

📍 South San Francisco, California

- US Prov. Pat. Ref No 823.102

Working at Twist and Zymergen on new product research requires confidentiality, but public evidence of accomplishments often comes in patent applications. The Legal teams know me well for being a helpful expert in the process.

- 4/9/21 • **Libraries for mutational analysis**
Twist Bioscience • South San Francisco, California
• US Prov. Pat. Ref No 823.101
- 3/25/21 • **Method for counterselection in microorganisms**
Zymergen, Inc. • Emeryville, California
• US 2021_0087586 A1



SELECTED PUBLICATIONS

- 12/21/21 • **Twist Pan-cancer synthetic reference materials technical guide**
[Twist Bioscience](#) • South San Francisco, California
• Patrick Cherry & Mike Bocek
- 2019 • **Multiple decay events target HAC1 mRNA during splicing to regulate the unfolded protein response**
[eLife](#)
• Cherry, P., Peach, S., & Hesselberth, J.
- 2018 • **Genetic bypass of essential RNA repair enzymes in budding yeast**
[RNA](#)
• Cherry, P., White, L., York, K., & Hesselberth, J.



SELECTED PRESENTATIONS & TALKS

- 11/19/23 • **High sensitivity detection of specific ultra low-frequency somatic mutations for minimal residual disease (MRD) monitoring**
International Society of Liquid Biopsy Annual Congress • Madrid, Spain
- 4/16/23 • **Twist pan-cancer synthetic RNA fusion control for assay development**
[American Association for Cancer Researchers](#) • Orlando, Florida
- 2/7/23 • **Use of synthetic CNV fragments to mimic copy number alterations for ctDNA reference standards**
[Advances in Genome Biology and Technology](#) • Hollywood, Florida
- 4/12/22 • **Twist pan-cancer synthetic reference materials for cell-free DNA (cfDNA) assay development**
[American Association for Cancer Researchers](#) • New Orleans, Louisiana
- 7/13/21 • **Molecular Methods Meet the Standards: Or how I learned to stop worrying and love UV-quantification**
Twist R&D Meeting • South San Francisco, CA
- 6/16/20 • **R use at Zymergen**
Z-Tech Talk • Emeryville, CA
- 4/20/20 • **Data-driven troubleshooting of NGS experiments**
Data Science Talk • Emeryville, CA

I communicate my results clearly, both in writing and in live presentations. I enjoy writing research papers, but my career has required more tech notes and app notes recently.

I give audience-centered presentations by adapting on the fly and over time to the venue and occasion. I like to *transfer knowledge* by giving methods/best practices talks whose slides can also serve as documentation.