PATRICK CHERRY

PhD scientist skilled in molecular biology, next-generation sequencing (NGS), and tool-building. I've launched best-in-class oncology reference standards, invented new molecular methods for DNA and microbe manipulation, and coded high-throughput experimental designs and genomic analyses. I'm interested in taking my knowledge and practice of data science and bioinformatics to the next level.

EDUCATION

2019 | 2013

PhD

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

- Ph.D. in Molecular Biology
- PI: Jay Hesselberth, PhD.
- Thesis on RNA Terminus chemistry affecting 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
- PI: 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 OEM projects, and commercial release OEM. Included the *Pan-cancer RNA Fusion Controls*, *Fragmentomics Standards*, *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 synthesis methods.
- Custom analysis demonstrated proof-of-concept design and QC success of the Pan-cancer RNA Fusion Controls; designed and implemented the production approach; used public data and feedback from alpha testers to design configuration of fusions RNAs
- 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 Snowflake for parameterized `dbplyr` querying

CONTACT

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

I have worked in a variety of roles ranging from HTP strain onboarding to R&D scientist. I like collaborative environments where I can learn from my peers and in turn teach others.

Last updated on 2023-04-28.

Data-driven CV 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 precise high-throughput DNA quantification process for accurate pooling
- Multiple iterations of custom NGS analysis refined the QC approach and thresholds for ensuring a contamination-free production process.
- Made extensive use of UMI sequencing and novel method to precisely quantify 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.

2013 | 2012

Undergraduate Research Assistant

Lab of Dr. Andres Caro, Hendrix College — Conway, Arkansas

2012 | 2012

Summer Undergraduate Research Fellowship

Lab of Dr. Michael Shiloh, UT Southwestern Medical Center — Dallas, Texas

2011 | 2010

Research Assistant

Lab of Dr. Joy Sturtevant, Louisiana Health Sciences Center — New Orleans, Louisiana

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

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

4/22/22

Characteristics and specificity of the wild-type / 0% VAF reference material
Twist Bioscience — South San Francisco, California
• Patrick Cherry & Mike Bocek

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

4/16/23

Twist pan-cancer synthetic RNA fusion control for assay development
American Association for Cancer Researchers — Orlando, Florida
• *Patrick Cherry*, Jason Corwin, Yu Cai, Kit Fuhrman, Jean Challacombe, Derek Murphy, Esteban Toro

4/19/23

High sensitivity detection of specific ultra low-frequency somatic mutations for minimal residual disease (MRD) monitoring
American Association for Cancer Researchers — Orlando, Florida
• Tong Liu, Michael Bocek, *Patrick Cherry*, Shawn Gorda, Jean Challacombe, Derek Murphy and Esteban Toro

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

4/19/23 **An end-to-end workflow for accurate methylation detection**
American Association for Cancer Researchers — Orlando, Florida
• Lydia Bonar, Kristin Butcher, Michael Bocek, Holly Corbitt, Bryan Hoglund, Cibelle Nassif, *Patrick Cherry*, Derek Murphy, Jean Challacombe, Esteban Toro

4/10/23 **Colorado RNA Club Industry Session**
Colorado RNA Club — Boulder, Colorado

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
• Jason Corwin, *Patrick Cherry*, Shawn Gorda, Michael Bocek, Jean Challacombe, Derek Murphy, Esteban Toro

5/26/22 **Efficient, high sensitivity detection of oncogenic variants with UMIs and target enrichment**
European Human Genetics Conference — Vienna, Austria
• Michael Bocek, Lydia Bonar, Jean Challacombe, Richard Gantt, *Patrick Cherry*, Rebecca Liao, Derek Murphy and Esteban Toro

4/12/22 **Twist pan-cancer synthetic reference materials for cell-free DNA (cfDNA) assay development**
American Association for Cancer Researchers — New Orleans, Louisiana

3/17/22 **Twist reference material products: current methods and future applications**
Twist R&D Symposium — South San Francisco, CA

4/5/22 **Pan-cancer Reference Standard: Methods in Automation & Future Needs**
Twist Automation Group Meeting — South San Francisco, CA

2/15/22 **Pan-cancer Reference Standard: Methods & Lessons from NPI & QC**
Twist R&D Meeting — South San Francisco, CA

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

3/27/20 **NGS Sample Preparation Deep-Dive**
NGS Technical Talk Series — Emeryville, CA

4/10/21 **Colorado RNA Club Industry Session**
Colorado RNA Club — Boulder, Colorado

2019 **RNA terminus chemistry potentiates decay events that target HAC1 mRNA during the unfolded protein response**
Thesis Defense Seminar — Aurora, Colorado

2019 **RNA modification and decay regulates the unfolded protein response**
Rocky Mountain Yeast Meeting Poster — Fort Collins, Colorado

2018 **What the unfolded protein response teaches us about RNA decay**
Bolie Scholar Talk, Molecular Biology Program Retreat — Winter Park, CO

2018 **Genetic bypass of essential yeast RNA repair enzymes**
Rocky Mountain Yeast Meeting Poster — Golden, Colorado

2017 **RNA processing regulates the unfolded protein response**
CSHL: mRNA Processing Meeting Talk — Cold Spring Harbor, New York

2017 **Genetic bypass of essential yeast RNA repair enzymes**
Molecular Biology Program Update Talk — Aurora, Colorado

2017 **Genetic bypass of essential yeast RNA repair enzymes**
Rocky Mountain Yeast Meeting Poster — Boulder, Colorado

2016 **RNA processing regulates the unfolded protein response**
RNA Club Talk — Boulder, Colorado

2016 **RNA Healing and Destruction**
Molecular Biology Program Update Talk — Aurora, Colorado

2016 **RNA processing regulates the unfolded protein response**
Rocky Mountain Yeast Meeting Poster — Fort Collins, Colorado

2015 **Turnover of endonucleolytic products of No-Go mRNA decay**
RNA Stability Meeting — Estes Park, Colorado

2015 **RNA 5-kinase-mediated co-translational mRNA decay**
Molecular Biology Program Update Talk — Aurora, Colorado

2015 **RNA 5-kinase-mediated co-translational mRNA decay**
Rocky Mountain Yeast Meeting Poster — Aurora, Colorado

2014 **RNA 5-kinase-mediated co-translational mRNA decay**
Rocky Mountain Yeast Meeting Poster — Boulder, Colorado

2013 **Coordinated upregulation of antioxidant protection and mitochondrial DNA biosynthesis in liver cells by oxidative stress**
Senior Undergraduate Capstone Research Talk — Conway, Arkansas

TRAINEES & DIRECT REPORTS

Current | 2022 **Derek Cai, BS, University of California San Diego, Research Associate I**
Twist Bioscience — South San Francisco, California

Current | 2021 **Lydia Bonar, MS, Johns Hopkins University, Scientist**
Twist Bioscience — South San Francisco, California

While I've never been in a "manager" position, all Scientist positions I've accepted have had formal report management responsibility. I take managing and mentoring seriously and emphasize trust, learning, and growth with my reports.

2022 | 2021

Alonzo Lee, BS, University of California Santa Cruz, Scientist

Twist Bioscience — South San Francisco, California

2021 | 2020

Kaisle Hill, BA, University of California Berkeley, Senior Research Associate

Zymergen, Inc. — Emeryville, California

2017

Rachel A Jones, MS, University of Arizona, Postdoctoral Fellow

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

2016

Laura K White, MS, Biotechnology, Johns Hopkins University, Postdoctoral Fellow

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

2016 | 2014

Haven Himmighoefer, Undergraduate, University of Colorado Denver

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

2015

Leslie Aranda, Undergraduate, University of California Riverside

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