Sean Maden

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GitHub:	Profile:	https://github.com/metamaden

Degrees

Oregon Health and Sciences University, August 2018-2021 (expected)
Department of Biomedical Engineering,
Portland, OR
Doctorate of Philosophy (Ph.D) in Computational Biology with Dr. Nellore's lab, research emphasis on integrative epigenetics of cancers, and dissertation emphasis on developing statistical platforms for integrative multi-omics/molecular assay datatypes, automated patterns detection, and cloud deployment.

Reed College, *Portland, OR* September 2007 - May 2011
Bachelor's of Arts (B.A.) Biology, emphasis: population genetics
Rigorous liberal arts curriculum in humanities and science; Population biology and genetics emphasis; Thesis characterizing population declines in genetic diversity of lab cichlids (*A. burtoni*) using microsatellite molecular markers.

Selected Research Experience

Research Data Analyst Assistant October 2015 - present
Fred Hutch, Seattle, WA
Principal Investigators: Dr. William Grady, Dr. Ming Yu
Lab website
Studied epigenetics of gastroesophageal cancers; Applied data processing and analytical pipelines for arrays and next-generation technologies; Motivated inter-lab and department collaboration; Coauthored, edited manuscripts of original research for publication; Made significant contributions to grant writing; Conducted lectures and poster presentations at conferences; Applied R, Python, and related statistical computing software for data mining and biostatistical analysis; Optimized workflows and lab repositories.

Bioinformatics Research Intern April - September 2015
Fred Hutch, Seattle, WA
Principal Investigator: Dr. William Grady; Postdoc project lead: Dr. Ming Yu
Carried out original analyses of cancer epigenetic data; Self-taught analytical programming; Presentation of findings and research discussion at lab meetings. Lab website.

Laboratory Assistant January – October 2013
Principle Investigator/Advisor: Dr. Gail Jarvik
University of Washington Medical Genetics
Analyzed clinical population and epidemiologic data; Quantified gene-environment interactions with modeling and regression techniques; Programmed preprocessing workflows for next-generation genomics; Coauthored and edited published manuscript of findings (see Publications).

Undergraduate Thesis Researcher September 2010 - May 2011
Advisor: Dr. Suzy Renn
Thesis website
Reed College, Biology Department
Quantified effects of laboratory breeding on genetic diversity in cichlid fishes (*A. burtoni*) using microsatellites; Authored thesis studying genetic diversity of lab cichlid fishes with microsatellites, and defended thesis before professorial board; Attained department grant funding (see Research Awards).

Scientific Memberships, Fellowships, and Funding

2016 SAS-BWF Fellow, Fred Hutch, Seattle, WA May 2016 - 2017
Advisors: Dr.'s Bill Grady and Ming Yu
Fellowship hosted and funded by SAS Institute and Burroughs Wellcome Fund. Contributed to ongoing research of epigenetics of colorectal cancer and biomarker discovery for clinical screening. Worked closely with JMP developers and recommended new software features based on real research needs.

AACR Associate Member, Fred Hutch, Seattle, WA Jan 2016 - present
Recognized and supported by Association for Cancer Research (AACR) as promising early-career cancer investigator. AACR is one of the largest cancer research organizations in the US, and it hosts numerous annual meetings and workshops to help cancer researchers network and learn from colleagues.

Undergraduate Research Grant, Reed College, Portland, OR Winter 2010
Advisor: Dr. Suzy Renn
Granted funding to extend research for undergraduate senior thesis studying genetic diversity of *A. burtoni* fishes (see Publications), awarded by Reed College Biology Department based on submission of original research overview.

Fischer Memorial Fellow, Reed College, Portland, OR Summer 2010
Advisor: Dr. Robert Kaplan
Designed and conducted habitat field survey experiment of native at-risk frog *Rana aurora*, constructed breeding habitat and compiled a literature review of amphibian ecology. Authored and coauthored extensive reports presented as contributions to canon of Fisher Fellows past and present.

Scientific Publications

1. Yuna Guo, Kelly Carter, Ming Yu, Sean K. Maden, Darwin Edmonds, Polly Newcomb P, Christopher Li, Neli Ulrich, William M. Grady. *Senescence associated secreted factors are candidate drivers of the age related risk of colorectal cancer.* 2018 (*under peer review*).

2. Georg E. Luebeck, William D. Hazelton, Kit Curtius, **Sean K. Maden**, Ming Yu, Kelly T. Carter, Wynn Burke, Paul D. Lampe, Christopher I. Li, Cornelia M. Ulrich, Polly A. Newcomb, Maria Westerhoff[11], Andrew M. Kaz, Yanxin Luo, John M. Inadomi, William M. Grady. *Implications of epigenetic drift in colorectal neoplasia.* 2018 (*under peer review*)

3. Ming Yu*, **Sean Maden***, Matthew Stachler*, Andrew M. Kaz, Tai J. Heinzerling, Rachele M O'Leary, Xinsen Xu, Adam Bass, Amitabh Chak, Joseph E. Willis, Sanford D. Markowitz, William M. Grady. *Subtypes of Barrett's Esophagus and Esophageal Adenocarcinoma Based on Genome-wide Methylation Analysis*. 2017, Gut. *co-first authors (link)

4. Ludovic Barault, Alessio Amatu, Giulia Siravegna, Agostino Ponzetti, Sebastian Moran, Andrea Cassingena, Benedetta Mussolin, Chiara Falcomatà, Alexandra Binder, Carmen Cristiano, Daniele Oddo, Carlotta Cancelliere, Sara Bustreo, Katia Bencardino, **Sean Maden**, Alice Vanzati, Patrizia Zavattari, Mauro Truini, William M. Grady, Patrizia Racca, Karin B. Michels, Salvatore Siena, Manel Esteller, Alberto Bardelli, Andrea Sartore-Bianchi, Federica Di Nicolantonio. *Discovery of methylated circulating DNA biomarkers for comprehensive non-invasive monitoring of treatment response in metastatic colorectal cancer*. 2017 Gut; PMCID: PMC5897187 (link)

5. Georg E. Luebeck, Kit Curtius, William D Hazelton, **Sean Maden**, Ming Yu, Prashanthi N Thota, Deepa T Patil, Amitabh Chak, Joseph E Willis, William M Grady. *Identification of a key role of widespread epigenetic drift in Barrett's esophagus and esophageal adenocarcinoma*. 2017 Clinical Epigenetics; PMCID: PMC5644061. (link)

6. (**Acknowledgement**) Kit Curtius, Chao-Jen Wong, William D. Hazelton, Andrew M. Kaz, Amitabh Chak, Joseph E. Willis, William M. Grady, Georg E. Luebeck. *A Molecular Clock Infers Heterogeneous Tissue Age Among Patients with Barrett's Esophagus*. May 11, 2016 PLoS Comput Bio.; PMID: 27168458 (link)

7. Daniel Seung Kim, **Sean K Maden**, Amber A Burt, Jane E Ranchalis, Clement E Furlong and Gail P Jarvik. *Dietary fatty acid intake is associated with paraoxonase 1 activity in a cohort-based analysis of 1,548 subjects*. 2013 Lipids in Health and Disease; PMCID: PMC3878825. (link)

8. **Sean Maden**, Advisor: Suzy P Renn. *Observed Declines in Genetic Diversity Across Successive Generations of a Captive Astatotilapia burtoni Lineage, Using Microsatellite Molecular Markers*. Senior Thesis, 2011 Reed College. (link)

Scientific Lay Press Pieces

(**Acknowledgements**) Anne-Sophie Kuhlman. “Esophageal adenocarcinoma: when DNA methylation informs the treatment”. Fred Hutch Science Spotlight July 16, 2018. (link)

Selected Bioinformatics Skills and Interests

R, JMP, STATA, statistical software;
Bioconductor/Bioc;
Tibbles, tidyverse, dply, Rstudior;
R modules, ggplot2, Gviz;
R-shiny apps, reactive programming;
GitHub, version control;
Python and shell scripting;
Windows and nix interfaces;
Compute clusters/kernels;
Parallel computing;
Amazon Web Services (AWS);
Cloud optimization;
TCGA, GEO, and GDAC repos;
PostgreSQL clinical records db;
SQL queries;
Sweave, knitr, LaTeX typesetting;
Statistical modeling and regression;
Machine learning, automation;
SVM, elastic net, glmnet;
ROC/AUC and predictive analyses;
Biomarker discovery;
Next-generation sequencing;
Methylation array data mining;
Gene network analysis;
Epigenetic regulation of expression;
Medical and genomic informatics;
Biomedical data science;
Gene Ontology/KEGG enrichment;
Hi-C and TAD 3d assays;
Comparative epigenetics;
ChIP-seq, enhancer activity;
Super-enhancers, ROSE algorithm;
VELs/Disease histone activation;

Research Lectures and Presentations

1. (poster) Mitra Barahimi, **Sean Maden,** Ming Yu, Kelly Carter, William Grady. *Discovery and Validation of Potential Field Cancerization Molecular Markers That Associate With Metachronous Polyp Formation*. 2017 (abstract submitted to 2018 Digestive Disease Week).

2. (lecture) **Sean Maden**. *Identification of Novel Molecular Characteristics of Methylation Subtypes in Esophageal Adenocarcinoma by Integrated Analysis*. Cancer Epigenetics Affinity Group meeting. Fred Hutch campus. Nov. 7, 2017.

3. (poster) **Sean Maden*** and Georg Luebeck*, Kit Curtius, William Hazelton, Ming Yu, Prashanti Thota, Deepa Patil, Amitabh Chak, Joseph Willis, William Grady *co-first authors. *Scope and Significance of Epigenetic Drift in Barrett's Esophagus.* Cancer Systems Biology Consortium (CSBC) Principal Investigator Meeting, Broad Institute MIT, Cambridge, MA. Oct 3, 2017 (link)

4. (lecture) **Sean Maden**. *Spatial and temporal epigenetic pattern gradients differentiate normal and progressed tissues in esophagus.* Cancer Intervention and Surveillance Modeling Network (CISNET) 2017 meeting, Esophageal Cancer projects, June 6, 2017.

5. (poster) **Sean Maden***, Ming Yu*, Matthew Stachler*, Andrew M. Kaz, Tai J. Heinzerling, Rachele M O'Leary, Xinsen Xu, Adam Bass, Amitabh Chak, Joseph E. Willis, Sanford D. Markowitz, William M. Grady (*co-first authors). *Genome-wide methylation analysis reveals methylator subtypes of Barrett's esophagus and esophageal adenocarcinoma*. 2016 AACR Annual Meeting, Abstract: #3192, Session: DNA Methylation 1 (link)

Science Coursework, Graduate Level

University of Washington
Fall 2012- Fall 2013 (no degree obtained)

PHG 536: Bioinformatics and Sequence Analysis
BIOSTAT 517/518: Applied Biostatistics I and II
EPI 512/513: Epidemiological Methods I and II
PHG 512: Law and Ethics in Public Health Genetics
PHG 513: Pharmacogenetics and Toxicogenomics
BIOST 580: Biostatistics Seminar
EPI 583: Epidemiology Seminar
GENOME 525: Topics in Human Genetics
PHG 511: Genetic Epidemiology
PHG 521: Culture and Societal Genomics
PHG 523: Genetics and the Law

Science Coursework, Undergraduate Level

Reed College, Undergraduate Courses
Fall 2007- Spring 2011 (obtained B.A. Biology)

MATH 111: Calculus
MATH 112: Intro to Analysis
PHYS 100: General Physics I
HIST 315: Medieval/Renaissance Science and Religion
BIOL 332: Vascular Plant Diversity
BIOL 101/102: Introductory Biology
CHEM 101/102: Introductory Chemistry
BIOL 361: Genetics
BIOL 431: Seminar: Ecology and Evolution of Plant-Human Interactions
BIOL 358: Microbiology
BIOL 366: Population Ecology and Evolution
CHEM 201/202: Organic Chemistry I and II
PHIL 201: Logic
BIOL 351: Developmental Biology (lecture only)
BIOL 431: Seminar: Chromosome Structure
PHIL 316: Philosophy of Science
BIOL 431: Seminar: Gene Duplication/Overexpression

Shoreline Community College, Undergraduate Courses
Fall 2014- Winter 2015 (no degree obtained)

BIOL 270: Molecular Biology
BIOL 285: Basics of Bioinformatics
BIOL 286: Molecular Diagnostics
BIOL 265/266: Solution and Media Prep I and II
BIOL 275: Recombinant DNA

Find Me Online

Webpage and Blog (programming and research): https://metamaden.github.io/
GitHub (programming and research): https://github.com/metamaden
ResearchGate (research): https://www.researchgate.net/profile/Sean_Maden3
LinkedIn (profile): linkedin.com/in/sean-maden-41623640/
Twitter (research): https://twitter.com/MadenSean

References available upon request.