# ANTONY HOLMES

Data scientist and full stack software developer with 8 years experience developing open source software and applications for cancer genetics research.

Experienced in the full software development life-cycle from requirement definition, prototyping, design, interface implementation, and maintenance.

Excellent written and oral communication skills demonstrated by more than 25 publications.

## CONTACT


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## Experience

2015-present

### SENIOR BIOINFORMATICS DEVELOPER

Columbia University

Full stack systems engineer with expertize developing web based genomics tools and databases using Java, Python, and Javascript.

Migrated lab data and core applications onto AWS cloud infrastructure using a mixture EC2, S3, and RDS services reducing costs by 90%.

Created a new Institute for Cancer Genetics department web site within a budgeted 6 month timeframe using a static site single page application written in **React+JSX** to implement modern web standards, ease deployment and updates, and reduce costs by 80%.

Developed multi-user database genomic web applications running on AWS using Django, API Gateway, and Postgresql to allow users remote access to core lab data and analysis to improve productivity.

2012-2015

### ASSOCIATE RESEARCH SCIENTIST

Columbia University

Developed expertise in analyzing microarray, SNP 6.0, RNA-seq, Chip-seq, and single cell genomic data using next generation sequencing tools.

Developed cluster based data pipelines using **Python**, **R**, and **BASH** to run next generation sequencing and big data analysis that reduced analysis time from days to hours.

Core **Java** developer creating desktop applications empower scientists to analyse data on their own. The applications are available as an open source suite of specialized genomics tools on GitHub.

Published over **25** articles on B-cell development and genetic lesions associated with development in high impact journals, including Nature, Cell, Blood, and the New England Journal of Medicine.

2009-2012

### POST DOCTORAL RESEARCH SCIENTIST

Columbia University

Data mining electronic health records (EHR) at New York Presbyterian Hospital.

Onboarded as database administrator to create a research version of the hospital EHR system for multi-user access to researchers.

Studied patterns of influenza to look for predictive power in hospital records for New York public health.

Discovered novel relationships between rare diseases and co-morbidities which were developed into **MATLAB** and **Java** applications to offer potential avenues for new therapeutics. This work resulted in three publications.

## EDUCATION

**PH.D MATHEMATICAL BIOLOGY**
2009, University of Warwick UK
SIWN Best Paper Award

**M.SC COMPUTER SCIENCE**
2004, University of Warwick UK

**B.SC COMPUTER SCIENCE**
2003, University of Warwick UK
First-class honours

## Volunteer Work

2017-present

### TAX TEAM LEADER

New York Cares

IRS certified tax preparer helping New Yorkers file their tax returns for free during tax season.

Work with clients one-on-one to understand their tax situation and prepare their federal and state returns.

Save clients **$30,000** in fees per year.

Manage a small team of volunteers and act as a liaison between New York Cares and partner organizations.

Quality review tax returns for accuracy before filing.

## Skills

**Programming Languages**

Java
Swing, JavaFX, Apache-Math, Spring Boot, Maven

Python
Pandas, Numpy, Scikit-learn, Django

Web
Node, React, Electron, Gatsby, JSX, TypeScript, HTML/CSS

Databases
PostgreSQL, MySQL, Sqlite

Math
R, MATLAB

**Software Development**

AWS
EC2, S3, Lambda, CloudFront, API Gateway

Development
Eclipse, Visual Studio Code, Git

Cluster
SGE, BSUB

Office
Microsoft Office with VBA, LaTeX, Inkscape, Photoshop, Illustrator

**Bioinformatics**

Sequencing
Bowtie, Hisat2, STAR, ChIPseeqer, 10x Cell Ranger

Tools
GSEA, GenePattern, BLAST

Source code for this resume is available at: github.com/antonybholmes/resume

## References

**Prof. Riccardo Dalla-Favera**
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**Prof. Katia Basso**
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**Prof. Raul Rabandan**
Department of Systems Biology
Columbia University
New York
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# Publications

**1. Single-cell analysis of germinal-center B cells informs on lymphoma cell of origin and outcome**
Holmes AB, Corinaldesi C, Shen Q, Kumar R, Compagno N, Wang Z, Nitzan M, Grunstein E, Pasqualucci L, Dalla-Favera R, Basso K
J Exp Med. 2020.

**2. miR-939 acts as tumor suppressor by modulating JUNB transcriptional activity in pediatric anaplastic large cell lymphoma**
Garbin A, Lovisa F, Holmes AB, Damanti CC, Gallingani I, Carraro E, Accordi B, Veltri G, Pizzi M, d'Amore ESG, Pillon M, Biffi A, Basso K, Mussolin L
Haematologica. 2020.

**3. Unique and Shared Epigenetic Programs of the CREBBP and EP300 Acetyltransferases in Germinal Center B Cells Reveal Targetable Dependencies in Lymphoma**
Meyer SN, Scuoppo C, Vlasevska S, Bal E, Holmes AB, Holloman M, Garcia-Ibanez L, Nataraj S, Duval R, Vantrimpont T, Basso K, Brooks N, Dalla-Favera R, Pasqualucci L
Immunity. 2019.

**4. MEF2B Instructs Germinal Center Development and Acts as an Oncogene in B Cell Lymphomagenesis**
Brescia P, Schneider C, Holmes AB, Shen Q, Hussein S, Pasqualucci L, Basso K, Dalla-Favera R
Cancer Cell. 2018.

**5. Common nonmutational NOTCH1 activation in chronic lymphocytic leukemia**
Fabbri G, Holmes AB, Viganotti M, Scuoppo C, Belver L, Herranz D, Yan XJ, Kieso Y, Rossi D, Gaidano G, Chiorazzi N, Ferrando AA, Dalla-Favera R
Proc Natl Acad Sci U S A. 2017.

**6. The CREBBP Acetyltransferase Is a Haploinsufficient Tumor Suppressor in B-cell Lymphoma**
Zhang J, Vlasevska S, Wells VA, Nataraj S, Holmes AB, Duval R, Meyer SN, Mo T, Basso K, Brindle PK, Hussein S, Dalla-Favera R, Pasqualucci L
Cancer Discov. 2017.

**7. The genetics of nodal marginal zone lymphoma**
Spina V, Khiabanian H, Messina M, Monti S, Cascione L, Bruscaggin A, Spaccarotella E, Holmes AB, Arcaini L, Lucioni M, Tabbò F, Zairis S, Diop F, Cerri M, Chiaretti S, Marasca R, Ponzoni M, Deaglio S, Ramponi A, Tiacci E, Pasqualucci L, Paulli M, Falini B, Inghirami G, Bertoni F, Foà R, Rabadan R, Gaidano G, Rossi D
Blood. 2016.

**8. Prognostic and therapeutic role of targetable lesions in B-lineage acute lymphoblastic leukemia without recurrent fusion genes**
Messina M, Chiaretti S, Wang J, Fedullo AL, Peragine N, Gianfelici V, Piciocchi A, Brugnoletti F, Di Giacomo F, Pauselli S, Holmes AB, Puzzolo MC, Ceglie G, Apicella V, Mancini M, Te Kronnie G, Testi AM, Vitale A, Vignetti M, Guarini A, Rabadan R, Foà R
Oncotarget. 2016.

**9. The FOXO1 Transcription Factor Instructs the Germinal Center Dark Zone Program**
Dominguez-Sola D, Kung J, Holmes AB, Wells VA, Mo T, Basso K, Dalla-Favera R
Immunity. 2015.

**10. Genomic and proteomic characterization of two novel siphovirus infecting the sedentary facultative epibiont cyanobacterium Acaryochloris marina**
Chan YW, Millard AD, Wheatley PJ, Holmes AB, Mohr R, Whitworth AL, Mann NH, Larkum AW, Hess WR, Scanlan DJ, Clokie MR
Environ Microbiol. 2015.

**11. Disruption of KMT2D perturbs germinal center B cell development and promotes lymphomagenesis**
Zhang J, Dominguez-Sola D, Hussein S, Lee JE, Holmes AB, Bansal M, Vlasevska S, Mo T, Tang H, Basso K, Ge K, Dalla-Favera R, Pasqualucci L
Nat Med. 2015.

**12. MicroRNA 28 controls cell proliferation and is down-regulated in B-cell lymphomas**
Schneider C, Setty M, Holmes AB, Maute RL, Leslie CS, Mussolin L, Rosolen A, Dalla-Favera R, Basso K
Proc Natl Acad Sci U S A. 2014.

**13. Genetic lesions associated with chronic lymphocytic leukemia chemo-refractoriness**
Messina M, Del Giudice I, Khiabanian H, Rossi D, Chiaretti S, Rasi S, Spina V, Holmes AB, Marinelli M, Fabbri G, Piciocchi A, Mauro FR, Guarini A, Gaidano G, Dalla-Favera R, Pasqualucci L, Rabadan R, Foà R
Blood. 2014.

**14. Genetics of follicular lymphoma transformation**
Pasqualucci L, Khiabanian H, Fangazio M, Vasishtha M, Messina M, Holmes AB, Ouillette P, Trifonov V, Rossi D, Tabbò F, Ponzoni M, Chadburn A, Murty VV, Bhagat G, Gaidano G, Inghirami G, Malek SN, Rabadan R, Dalla-Favera R
Cell Rep. 2014.

**15. Genetic lesions associated with chronic lymphocytic leukemia transformation to Richter syndrome**
Fabbri G, Khiabanian H, Holmes AB, Wang J, Messina M, Mullighan CG, Pasqualucci L, Rabadan R, Dalla-Favera R
J Exp Med. 2013.

**16. tRNA-derived microRNA modulates proliferation and the DNA damage response and is down-regulated in B cell lymphoma**
Maute RL, Schneider C, Sumazin P, Holmes A, Califano A, Basso K, Dalla-Favera R
Proc Natl Acad Sci U S A. 2013.

**17. BCL6 positively regulates AID and germinal center gene expression via repression of miR-155**
Basso K, Schneider C, Shen Q, Holmes AB, Setty M, Leslie C, Dalla-Favera R
J Exp Med. 2012.

**18. Identification of human germinal center light and dark zone cells and their relationship to human B-cell lymphomas**
Victora GD, Dominguez-Sola D, Holmes AB, Deroubaix S, Dalla-Favera R, Nussenzweig MC
Blood. 2012.

**19. The coding genome of splenic marginal zone lymphoma: activation of NOTCH2 and other pathways regulating marginal zone development**
Rossi D, Trifonov V, Fangazio M, Bruscaggin A, Rasi S, Spina V, Monti S, Vaisitti T, Arruga F, Famà R, Ciardullo C, Greco M, Cresta S, Piranda D, Holmes A, Fabbri G, Messina M, Rinaldi A, Wang J, Agostinelli C, Piccaluga PP, Lucioni M, Tabbò F, Serra R, Franceschetti S, Deambrogi C, Daniele G, Gattei V, Marasca R, Facchetti F, Arcaini L, Inghirami G, Bertoni F, Pileri SA, Deaglio S, Foà R, Dalla-Favera R, Pasqualucci L, Rabadan R, Gaidano G
J Exp Med. 2012.

**20. Combined genetic inactivation of β2-Microglobulin and CD58 reveals frequent escape from immune recognition in diffuse large B cell lymphoma**
Challa-Malladi M, Lieu YK, Califano O, Holmes AB, Bhagat G, Murty VV, Dominguez-Sola D, Pasqualucci L, Dalla-Favera R
Cancer Cell. 2011.

**21. Whole-exome sequencing identifies somatic mutations of BCOR in acute myeloid leukemia with normal karyotype**
Grossmann V, Tiacci E, Holmes AB, Kohlmann A, Martelli MP, Kern W, Spanhol-Rosseto A, Klein HU, Dugas M, Schindela S, Trifonov V, Schnittger S, Haferlach C, Bassan R, Wells VA, Spinelli O, Chan J, Rossi R, Baldoni S, De Carolis L, Goetze K, Serve H, Peceny R, Kreuzer KA, Oruzio D, Specchia G, Di Raimondo F, Fabbiano F, Sborgia M, Liso A, Farinelli L, Rambaldi A, Pasqualucci L, Rabadan R, Haferlach T, Falini B
Blood. 2011.

**22. Discovery of cyanophage genomes which contain mitochondrial DNA polymerase**
Chan YW, Mohr R, Millard AD, Holmes AB, Larkum AW, Whitworth AL, Mann NH, Scanlan DJ, Hess WR, Clokie MR
Mol Biol Evol. 2011.

**23. BRAF mutations in hairy-cell leukemia**
Tiacci E, Trifonov V, Schiavoni G, Holmes A, Kern W, Martelli MP, Pucciarini A, Bigerna B, Pacini R, Wells VA, Sportoletti P, Pettirossi V, Mannucci R, Elliott O, Liso A, Ambrosetti A, Pulsoni A, Forconi F, Trentin L, Semenzato G, Inghirami G, Capponi M, Di Raimondo F, Patti C, Arcaini L, Musto P, Pileri S, Haferlach C, Schnittger S, Pizzolo G, Foà R, Farinelli L, Haferlach T, Pasqualucci L, Rabadan R, Falini B
N Engl J Med. 2011.

**24. Discovering disease associations by integrating electronic clinical data and medical literature**
Holmes AB, Hawson A, Liu F, Friedman C, Khiabanian H, Rabadan R
PLoS One. 2011.

**26. Signs of the 2009 influenza pandemic in the New York-Presbyterian Hospital electronic health records**
Khiabanian H, Holmes AB, Kelly BJ, Gururaj M, Hripcsak G, Rabadan R
PLoS One. 2010.

**27. Spatial simulations of myxobacterial development**
Holmes AB, Kalvala S, Whitworth DE
PLoS Comput Biol. 2010.

**28. Phosphate acquisition components of the Myxococcus xanthus Pho regulon are regulated by both phosphate availability and development**
Whitworth DE, Holmes AB, Irvine AG, Hodgson DA, Scanlan DJ
J Bacteriol. 2008.