Samson Jonathan Koelle
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4748 34th Avenue NE
Seattle, WA 98105

Education:
University of Washington, Seattle, WA   09/2015 – Present
Ph.D. Statistics: GPA 3.55
  - Relevant Coursework: Theory of Statistical Inference, High Dimensional Statistical Inference, Stochastic Modeling, Regression, Statistical Learning Theory, Manifold Geometry
  - Preliminary Exam: Statistical Learning (*Square root graphical models*) - 6/2016
  - Qualifying Exam: *Learning parameterizations of manifolds* - 5/2019
  - Expected graduation: 9/2020

Columbia University, New York, NY   09/2009 – 5/2013
B.A. Mathematics: GPA 3.74, Math subject GRE: 80%
  - Relevant Coursework: Modern Algebra, Modern Analysis, Topology, Knot Theory, Linear Algebra, Algebraic Topology, Topology, Computational Genomics, Molecular Systems Biology, Intro to CS, Discrete Math, Organic Chemistry, Biochemistry, Biology at Physical Extremes, Intro Physics

Skills:
Languages: Python, R
Code samples: https://github.com/sjkoelle/manifoldflasso_jmlr
                 https://github.com/dunbarlabNIH/

Experience:
University of Washington Department of Statistics, Seattle, WA   09/2017– Present
Advisor: Marina Meila
Amazon SCOT Forecasting Science, Seattle, WA   06/2017 – 09/2017
Supervisor: Kari Torkkola
University of Washington Department of Statistics, Seattle, WA   09/2016 – 06/2017
Supervisor: Johannes Lederer
Fred Hutchinson Cancer Research Center, Seattle, WA   09/2015 – 06/2017
Supervisor: Raphael Gottardo
National Hearth Lung and Blood Institute, Bethesda, MD   07/2013 – 05/2015
Supervisor: Cynthia Dunbar
Columbia University Department of Mathematics, New York, NY   05/2012 – 07/2012
Supervisor: Adam Knapp
University of Washington Department of Laboratory Medicine, Seattle, WA 05/2010 – 08/2010
Supervisor: Meei-li Huang   05/2011 – 08/2011

Publications:
Xu J, **Koelle S,** Guttorp P, Wu C, Dunbar CE, Abkowitz JL, Minin VN. *Statistical inference in partially observed stochastic compartmental models with application to cell lineage tracking of in vivo hematopoiesis.* arXiv:1610.07550 [stat.ME]. (To appear at Annals of Applied Statistics)

Paulson KG, Voillet V, Perdicchio M, Hunter DS, Wagener FD, Valente WJ, **Koelle SJ**, Church CD, Vandeven N, Thomas H, Colunga AG, McAfee MS, Iyer JG, Yee C, Kulikauskas R, Koelle DM, Pierce RH, Bielas JH, Greenberg PD, Bhatia S, Gottardo R, Nghiem P, Chapuis AG. *Acquired Cancer Resistance to Combination Immunotherapy from Transcriptional Loss of Class I HLA.* Nature Communications 9(1). December 2018

Wu C, Espinoza DA, **Koelle SJ,** Yang D, Truitt L, Schlums H, Lafont BA, Davidson-Moncada JK, Lu R, Kaur A, Hammer Q, Li B, Panch S, Allan DA, Donahue RE, Childs RW, Romagnani C, Bryceson YT, Dunbar CE. *Clonal expansion and compartmentalized maintenance of rhesus macaque NK cell subsets.* Science Immunology. 2018 Nov 2;3(29).

Yabe IM, Truitt LL, Espinoza DA, Wu C, **Koelle S,** Panch S, Corat MAF, Winkler T, Yu KR, Hong SG, Bonifacino A, Krouse A, Metzger M, Donahue RE, Dunbar CE. *Barcoding of Macaque Hematopoietic Stem and Progenitor Cells: A Robust Platform to Assess Vector Genotoxicity.* Mol Ther Methods Clin Dev. 2018 Oct 25

Yu, KR, Espinoza DA, Wu C, Truitt L, Shin TH, Chen S, Fan X, Yabe I , Panch S, Hong SG, **Koelle S**, Lu R, Bonifacino A, Krouse A, Metzger M, Donahue RE, Dunbar CE. *The impact of aging on primate hematopoiesis as interrogated by clonal tracking.* Blood. 2018 Jan 2.

Wu C, Espinoza D, **Koelle S,** Potter EL, Lu R, Li B, Yang D, Fan X, Donahue R, Roederer M, Dunbar CE. *Geographic Clonal Tracking in Macaques Provides Insights into HSPC Migration and Differentiation.* Journal of Experimental Medicine. 2018 Jan 2.

Koelle SJ, Espinoza DA, Wu C, Xu J, Lu R, Li B, Donahue RE, Dunbar CE. *Quantitative Stability of Hematopoietic Stem and Progenitor Cell Clonal Output in Transplanted Rhesus Macaques.* Blood. 2017 Mar 16;129(11):1448-1457

Wu C, Li B, Lu R, **Koelle SJ**, Yang Y, Jares A, Krouse, AE, Metzger M, Liang F, Lore K, Wu C, Donahue RE, Chen I, Weissman I, Dunbar CE. *Clonal tracking of rhesus macaque hematopoiesis highlights a distinct lineage origin for natural killer cells*. Cell Stem Cell. 2014;14:486–499. 39

Preprints/Under Review/Technical reports:
Koelle S*, Zhang H*, Meila M, Chen, Y. *Parameterizing Manifolds by Dictionaries*. Under review at AISTATS 2020.
Koelle S, Zhang H, Meila M, Chen, Y. *Manifold coordinates with physical meaning.* Under review at Journal of Machine Learning Research.
Chen Y, McQueen J, **Koelle S**, Meila M, Chmiela S, Tkatchenko A. *Modern manifold learning methods for MD data*. https://www.stat.washington.edu/mmp/Papers/mlcules-arxiv.pdf
Meila, M, **Koelle S,** Zhang H. *A regression approach for explaining manifold embedding coordinates*. 29 Nov 2018. arXiv:1811.11891 [stat.ML].

Presentations:
A family of algorithms for interpretable dimension reduction. UW eScience Seminar. Seattle, WA. 10/2019
Interpreting manifold embedding coordinates. UCLA IPAM Machine Learning for Physics Seminar. Los Angeles, CA 9/2019
Gradient group lasso identifies sparse functional basis for molecular manifolds. UW Physics Informed Machine Learning Workshop. Seattle, WA 6/2019
Gradient group lasso identifies sparse functional basis for molecular manifolds. UW CSSS 20th anniversary. Seattle, WA 5/2019
Non-linear regression for manifold learning in molecular dynamics. MSDSE Summit. Park City, UT 10/2018.
Wasserstein distance-based model selection for single-cell RNA-seq data. Presentation. Joint Statistical Meetings. Baltimore, MD. 08/2017
Election Forecasting. Panel. UW GPSS Academic Conference. Seattle, WA. 5/2017
Long-term clonal stability. Poster. American Society of Hematology Annual Conference. San Francisco, CA. 12/2014
NK-biased clonal expansion. Poster. Oncogenesis and Translation Medicine for the Treatment of Cancer Conference. Ribeirao Preto, SP, Brazil. 02/2014
Heegaard-Floer Braid Homology. Presentation. Columbia University Department of Mathematics Summer REU. 07/2014.
Helical modeling using the Frenet Frame, Presentation. Applications of Mathematics to Physiology and Medicine Workshop. Duke University Department of Mathematics. Durham, NC. 05/2012

Conference Abstracts:
Paulson K, Voillet V, Perdicchio M, Hunter D, Valente W, Wagener F, **Koelle S,** Church C, Vandeven N, Thomas H, Colunga A, Koelle D, Yee C, Kulikauskas C, Pierce R, Greenberg P, Bhatia S, Bielas J, Gottardo

R, Nghiem P, Chapuis A. *Single cell RNA sequencing reveals mechanisms of Merkel Cell Carcinoma escape from intense pressure of T Cell immunotherapy.* 2017 SITC Abstracts.

Xu J, **Koelle S,** Guttorp P, Wu C, Dunbar CE, Abkowitz JL, Minin VN. *Stochastic Modeling of Hematopoietic Stem and Progenitor Cell Barcoding Data from Rhesus Macaques Challenges the Classic Model of Hematopoiesis.* 2016 ASH Abstracts 2643.

Wu C, Espinoa DA, **Koelle S**, Yang D, Schlums H, Davidson-Moncada JK, Lu R, Kaur A, Quitin H, Li B, Panch SR, Donahue RE, Childs RW, Romagnani C, Bryceson Y, Dunbar CE. *Clonal Expansion and Long-Term Persistence of Rhesus Macaque NK Cells with an Adaptive Phenotype.* 2016 ASH Abstracts 549.

Wu C, **Koelle S**, Li B, Espinoza D, Lu R, Krouse AE, Metzger M, Donahue R, Dunbar CE. *Clonal Tracking of the Geographic Distribution of Hematopoiesis in Nonhuman Primates Provides New Insights into HSPC Migration and Differentiation*. 2015 ASH Abstract 241.

Yu K, Wu C, Espinoza D, Yabe I, Panch S, Hong S**, Koelle S,** Lu R, Bonifacino A, Krouse A, Metzger M, Donahue RE, Dunbar CE. *The impact of Aging of Hematopoietic Stem and Progenitor Cells (HSPCs) in Non-Human Primates As Interrogated By Genetic Barcode Clonal Tracking.* 2015 ASH Abstract 1151

Koelle S, Wu C, Xu J, Li B, Lu R, Donahue RE, Dunbar CE. *Long-term Hematopoietic Clonal Stability Tracked Using Molecular Barcoding in Non-human Primates.* 2014 ASH Abstract 2098.

Jung, M. Davidson-Moncada, JK, Wu C**, Koelle S**, Winkler T, Townsley DM, Hsu A, Keyvanfar K, Holland S, Hickstein D, Childs R, Dunbar CE. *Specific Impaired CD56+ NK Cell Development in GATA2 Deficiency As Revealed by Ex Vivo NK Expansion.* 2014 ASH Abstract 1419.

Awards:
Big Data IGERT Fellowship, University of Washington, 2017-2019
Chateaubriand Fellowship, Embassy of France, 2016
GRFP Honorable Mention: Biostatistics, NSF, 2016
Abstract Achievement Award, American Society of Hematology, 2014
Travel Grant, Sao Paulo School of Advance Science, 2014
Travel Grant, Duke University Department of Mathematics, 2012
Dean's List, Columbia University, 2009-20013

Support:
Big Data IGERT Fellowship, University of Washington, 2017-2019
Amazon Internship, 06/2017 – 09/2017
Chateaubriand Fellowship, Embassy of France, 06/2016 – 09/2016
Research Assistantship, Fred Hutchinson Cancer Research Center, 09/2015 – 06/2017
Intramural Research Training Award, National Institutes of Health, 07/2013 – 05/2013
Geometry/Topology REU, Columbia University Department of Mathematics, 05/2012 – 07/2012

Teaching, volunteer and community:
TA: Stat 340 Introduction to Probability (for majors), 09/2019-12/2019
Statistics department IM sports organizer (12 seasons), 03/2016-Present
Help room tutor, University of Washington Department of Statistics, 03/2016 – 06/2016
St. Luke's/Roosevelt Hospital, 01/2012 – 04/2013

References:
Marina Meila, University of Washington Department of Statistics   mmp@uw.edu
Cynthia Dunbar, National Heart Lung and Blood Institute   dunbarc@nhlbi.nih.gov
Kari Torkkola, Amazon   karito@amazon.com
Raphael Gottardo, Fred Hutchinson Cancer Research Center   rgottard@fredhutch.org
Johannes Lederer, University of Washington Department of Statistics ledererj@uw.edu
Mikhail Khovanov, Columbia University Math Department   khovanov@math.columbia.edu