Harvard Medical School/Harvard School of Dental Medicine
Format for the Curriculum Vitae

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Place of Birth: Belgrade, Serbia

Education

2008	Hon.B.Sc. (*with high distinction*)	Molecular Biology	University of Toronto
2013	Ph.D.	Genetics; Division of Medical Sciences (Matthew Meyerson)	Harvard University

Postdoctoral Training

06/13-08/16	Postdoctoral Fellow	Computational Microbiomics and Immunology	Broad Institute of MIT and Harvard

Faculty Academic Appointments

2016-	Member of the Faculty	Microbiology and Immunobiology	Harvard Medical School

Appointments at Hospitals/Affiliated Institutions

2016-	Assistant Investigator	Pathophysiology & Molecular Pharmacology	Joslin Diabetes Center

Other Professional Positions

Major Administrative Leadership Positions

Local

Regional

National and International

Committee Service

Local

Regional

National and International

Professional Societies

2014	Keystone Symposia	*Session Chair – Computational Approaches to Understanding Microbial Metabolism and Biosynthesis*

Grant Review Activities

2014	MLDS Focus Project Review Committee 2014	Dutch Digestive Disease Foundation Ad hoc member
2015	Joint Action Intestinal Microbiomics Review Committee 2015	Joint Programming Initiative (European Union) Ad hoc member

Editorial Activities

Bioinformatics
BMC Cancer
Cancer Research
Cell Host and Microbe
Gastroenterology
Genome Biology
Gut
Journal of Allergy and Clinical Immunology
Journal of Crohn's and Colitis
Microbiome
PeerJ
PLoS ONE

Other Editorial Roles

Honors and Prizes

2008-2010	Postgraduate Fellowship	Natural Sciences and Engineering Research Council of Canada	Research
2010-2013	Ryan Fellowship	Albert J. Ryan Foundation	Research
2012	Sachi Nakashima Memorial Fellowship	Keystone Symposia	Research
2014-2016	The Lawrence H. Summers Postdoctoral Fellowship	Broad Institute of MIT and Harvard	Research
2015-2018	Merck Fellow of the Helen Hay Whitney Foundation	Merck & Co., Inc. and the Helen Hay Whitney Foundation	Research

Report of Funded and Unfunded Projects

Funding Information

Past

Current

2017-2019 Immunological Investigation of Human Type 1 Diabetes-Associated Microbiomes in the Gnotobiotic Autoimmune Diabetic Mouse
Smith Family Awards Program for Excellence in Biomedical Research
PI ($285,000 – total direct costs)
This project seeks to dissect the role of the microbiome in accelerating autoimmune diabetes using the non-obese diabetic mouse model of the disease

2017-2022 Generation of an in vivo System for Dissection of the Human Type 1 Diabetes-associated Microbiome
American Diabetes Association Pathway to Stop Diabetes Initiator Award
PI ($1,157,500 – total direct costs)
The goal of this work is to create a new gnotobiotic mouse model system of autoimmune diabetes that allows for colonization with very specific microbiota

Current Unfunded Projects

Report of Local Teaching and Training

Teaching of Students in Courses

2017	Data Science I – Integrating Clinical, Genomic & Environmental Data 1st Year Masters Students	Harvard Medical School Three hours of lecture; Designing and grading a class project

Formal Teaching of Residents, Clinical Fellows and Research Fellows (post-docs)

Clinical Supervisory and Training Responsibilities

Laboratory and Other Research Supervisory and Training Responsibilities

2014-2016	Supervision of graduate students and junior postdoctoral fellows	Daily mentorship

Formally Supervised Trainees

2012	Lauren Robertson, Ph.D. Candidate/ Harvard School of Public Health Published a manuscript in *Cell Host and Microbe* together.
2013-2016	Tommi Vatanen, Ph.D. Candidate/ Broad Institute of MIT and Harvard Published two manuscripts together, one in *Cell* and the other in *Cell Host and Microbe*.
2015-2016	Eric Brown, Ph.D. Candidate/University of British Columbia In the process of publishing a paper together.
2017-	Jacob Luber, Ph.D. Candidate/Harvard Medical School Currently a rotation student in my lab.
2017-	Marsha Wibowo, Ph.D. Candidate/Harvard Medical School Currently a rotation student in my lab.
2017-	Jacob Gibson, Ph.D. Candidate/Harvard Medical School Currently a rotation student in my lab.
2017-	Arancha Hevia-Gonzalez, Postdoctoral Fellow, Joslin Diabetes Center A new postdoctoral fellow in my lab.
2017-	Tao Xu, Postdoctoral Fellow, Joslin Diabetes Center A new postdoctoral fellow in my lab.

Formal Teaching of Peers (e.g., CME and other continuing education courses)

2015	Unraveling the links between the microbiome and type 1 diabetes	1 talk, Joslin Diabetes Center, Boston, MA

Local Invited Presentations

2011 The colorectal cancer microbiome/Seminar
Broad Institute Infectious Diseases Meeting

2012 Genomic analysis and the association of Fusobacterium species with colorectal cancer/Annual Retreat Talk
Department of Immunology and Infectious Disease, Harvard School of Public Health

2016 Longitudinal microbiome analysis in type 1 diabetes/Seminar

Channing Network Science Seminar, Brigham and Women's Hospital

2016 The microbiome-immune interface in cancer and autoimmunity/Seminar
Cancer Immunology Seminar, Dana Farber Cancer Institute

Report of Regional, National and International Invited Teaching and Presentations

Invited Presentations and Courses

Regional

2011 A new association between colorectal cancer and the microbiome/Plenary Talk
Albert J. Ryan Fellowship Symposium; Fairlee, VT

2017 Nanopore sequencing, culturomics, and the role of the microbiome in type 1 diabetes\Seminar
Tech Talks, Immunology Section, Harvard Medical School

National

2011 Genomic analysis identifies association of *Fusobacterium* with colorectal carcinoma/Plenary Talk (abstract)
Cold Spring Harbor Meeting on The Biology of Cancer*;* Cold Spring Harbor, NY

2014 A prospective longitudinal analysis of the developing gut microbiome in infants en route to type 1 diabetes/Plenary Talk (abstract)
American Society for Microbiology 114th General Meeting; Boston, MA

2016 Unraveling the links between the gut microbiome and type 1 diabetes/Seminar
Washington University School of Medicine, St. Louis, MO

2016 Unraveling the links between the gut microbiome and type 1 diabetes/Seminar
University of California San Diego, La Jolla, CA

2016 Unraveling the links between the gut microbiome and type 1 diabetes/Plenary Talk
American Diabetes Association General Meeting; New Orleans, LA

2016 Primer on Microbiome-Wide Association Studies/Plenary Talk
American Society of Human Genetics General Meeting; Vancouver, BC

International

2013 *Fusobacterium nucleatum* potentiates intestinal tumorigenesis and modulates the tumor immune microenvironment/Plenary Talk (abstract)

Cell Symposia: Microbiome and Host Health; Lisbon, Portugal

Report of Clinical Activities and Innovations

Current Licensure and Certification

Practice Activities

Clinical Innovations

Report of Technological and Other Scientific Innovations

Bacterial etiology of colorectal cancer	US Patent Application, #61/714,624, filed Oct. 15, 2013 http://www.google.com/patents/US20140107092 As a member of the Meyerson lab, I had developed methods for predicting risk of developing colorectal cancer, for treating colorectal cancer, and reducing risk of developing colorectal cancer based on stool-based detection of *Fusobacterium* species.

Report of Education of Patients and Service to the Community

Activities

Educational Material for Patients and the Lay Community

Books, monographs, articles and presentations in other media

Educational material or curricula developed for non-professional students

Patient educational material

Recognition

Report of Scholarship

Publications

Peer reviewed publications in print or other media

1. **Kostic AD**, Ojesina AI, Pedamallu CS, Jung J, Verhaak RG, Getz G, Meyerson M (2011). PathSeq: software to identify or discover microbes by deep sequencing of human tissue. *Nature Biotechnology*. 29(5):393-6.

2. Stransky N, Egloff AM*, Tward AD*, **Kostic AD**, Cibulskis K, Sivachenko A, Kryukov G, Lawrence M, Sougnez C, McKenna A, Ramos AH, Stojanov P, Carter SL, Voet D, Cortes M, Auclair D, Saksena G, Guiducci C, Onofrio R, Parkin M, Robkes M, Weissfeld JL, Seethala RR, Wang L, Winckler W, Ardlie K, Gabriel SB, Meyerson M, Lander ES, Getz G, Golub TR, Garraway LA, Grandis JR (2011). The mutational landscape of head and neck squamous cell carcinoma. *Science*. 333(6046):1157-60.

3. Sealey DC, **Kostic AD**, LeBel C, Pryde F, Harrington LA (2011). The TPR domain of Est1 is a species-specific telomerase interaction module that regulates telomere length. *BMC Molecular Biology*. 12:45.

4. **Kostic AD**, Gevers D, Pedamallu CS, Michaud M, Duke F, Earl AM, Ojesina AI, Jung J, Bass AJ, Tabernero J, Baselga J, Liu C, Shivdasani RA, Ogino S, Birren BW, Huttenhower C, Garrett WS, Meyerson M (2012). Genomic analysis identifies association of *Fusobacterium* with colorectal carcinoma. *Genome Research*. 22(2):292-8.

5. **Kostic AD**, Garrett WS (2012). Keystone Microbiome Meeting 2012: A Mountaintop Experience. *EMBO Reports.* 13:478-80.

6. Verhaak RGW, Tamayo P, Yang JY, Hubbard D, Zhang H, Creighton C, Fereday S, Lawrence M, Carter SL, Mermel C, **Kostic AD**, Etemadmoghadam D, Saksena G, Cibulskis K, Duraisamy S, Levanon K, Sougnez C, Tsherniak A, Gomez S, Onofrio R, Gabriel S, Chin L, Zhang N, Spellman PT, Zhang Y, Akbani R, Hoadley KA, Kahn A, Kobel M, Huntsman D, Soslow RA, Defazio A, Birrer MJ, Gray JW, Weinstein JN, Bowtell DD, Drapkin R, Mesirov JP, Getz G, Levine DA, Meyerson M (2013). Prognostically relevant gene expression subtypes of ovarian serous adenocarcinoma. *Journal of Clinical Investigation*. 123(1):517-25.

7. **Kostic AD**, Howitt MR, Garrett WS (2013). Exploring host-microbiota interactions in animal models and humans. *Genes and Development.* 27(7):701-18.

8. Bhatt AS, Freeman SS, Herrera A, Pedamallu CS, Gevers D, Duke F, Jung J, Walker BJ, Young S, **Kostic AD**, Ojesina AI, Soriano G, Antin JH, Soiffer R, Baden L, Hornick JL, Marty F, Meyerson M (2013). Sequence-based discovery of *Bradyrhizobium enterica* in transplant-

associated colitis. *The New England Journal of Medicine.* 369(6):517-28.

9. **Kostic AD**, Chun E, Robertson L, Glickman JN, Gallini CA, Michaud M, Clancy TE, Chung DC, Lochhead P, Hold GL, El-Omar EM, Brenner D, Fuchs CS, Meyerson M*, Garrett WS* (2013). *Fusobacterium nucleatum* potentiates intestinal tumorigenesis and modulates the tumor-immune microenvironment. *Cell Host and Microbe*. 14(2):207-15.

10. **Kostic AD**, Chun E, Meyerson M, Garrett WS (2013). Microbes and inflammation in colorectal cancer. *Cancer Immunology Research*. 1(3):150-7.

11. Pulloor NK, Nair S*, **Kostic AD***, Bist P, Weaver JD, Riley AM, Tyagi R, Uchil PD, York JD, Snyder SH, García-Sastre A, Potter BVL, Lin R, Shears SB, Xavier RJ, Krishnan MN (2014). Human genome-wide RNAi screen identifies an essential role for inositol pyrophosphates in type-I interferon response. *PLoS Pathogens*. 10(2): e1003981.

12. **Kostic AD**, Xavier RJ, Gevers D (2014). The microbiome in inflammatory bowel disease: Current status and the future ahead. *Gastroenterology.* 146(6):1489-99.

13. Huttenhower C, **Kostic AD**, Xavier RJ (2014). Inflammatory bowel disease as a model for translating the microbiome. *Immunity.* 40(6):843-854.

14. Mima K, Sukawa Y, Nishihara R, Qian ZR, Yamauchi M, Inamura K, Kim SA, Masuda A, Nowak JA, Nosho K, **Kostic AD**, Giannakis M, Watanabe H, Bullman S, Milner DA, Harris CC, Giovannucci E, Garraway LA, Freeman GJ, Dranoff G, Chan AT, Garrett WS, Huttenhower C, Fuchs CS, Ogino S (2015). *Fusobacterium nucleatum* and T cells in colorectal carcinoma. *JAMA Oncology*. 1(5):653-61.

15. Wlodarska M, **Kostic AD**, Xavier RJ (2015). An integrative view of microbiome-host interactions in inflammatory bowel diseases. *Cell Host and Microbe*. 17(5):577-91.

16. **Kostic AD**, Gevers D, Siljander H, Vatanen T, Hyötyläinen T, Hämäläinen AM, Peet A, Tillmann V, Pöhö P, Mattila I, Lähdesmäki H, Franzosa EA, Vaarala O, de Goffau M, Harmsen H, Ilonen J, Virtanen SM, Clish CB, Orešič M, Huttenhower C, Knip M; DIABIMMUNE Study Group, Xavier RJ (2015). The dynamics of the human infant gut microbiome in development and in progression toward type 1 diabetes. *Cell Host and Microbe*. 17(2):260-273.

17. Mima K, Nishihara R, Qian ZR, Cao Y, Sukawa Y, Nowak JA, Yang J, Dou R, Masugi Y, Song M, **Kostic AD**, Giannakis M, Bullman S, Milner DA, Baba H, Giovannucci EL, Garraway LA, Freeman GJ, Dranoff G, Garrett WS, Huttenhower C, Meyerson M, Meyerhardt JA, Chan AT, Fuchs CS, Ogino S (2015). *Fusobacterium nucleatum* in colorectal carcinoma tissue and patient prognosis. *Gut*. 26 August 2015 doi:10.1136/gutjnl-2015-310101

18. Vatanen T*, **Kostic AD***, d'Hennezel E*, Siljander H, Franzosa EA, Yassour M, Kolde R, Vlamakis H, Arthur TD, Hämäläinen AM, Peet A, Tillmann V, Uibo R, Mokurov S, Dorshakova N, Ilonen J, Virtanen SM, Szabo SJ, Porter JA, Lähdesmäki H, Huttenhower C, Gevers D, Cullen TW, Knip M; DIABIMMUNE Study Group, Xavier RJ (2016). Variation in Microbiome LPS Immunogenicity Contributes to Autoimmunity in Humans. *Cell*. 165(6):1551.

19. Shaw KA, Bertha M, Hofmekler T, Chopra P, Vatanen T, Srivatsa A, Prince J, Kumar A, Sauer C, Zwick ME, Satten GA, **Kostic AD**, Mulle JG, Xavier RJ, Kugathasan S. Dysbiosis, inflammation, and response to treatment: a longitudinal study of pediatric subjects with newly diagnosed inflammatory bowel disease. *Genome Med*. 13;8(1):75.

20. Mima K, Cao Y, Chan AT, Qian ZR, Nowak JA, Masugi Y, Shi Y, Song M, da Silva A, Gu M, Li W, Hamada T, Kosumi K, Hanyuda A, Liu L, **Kostic AD**, Giannakis M, Bullman S, Brennan CA, Milner DA, Baba H, Garraway LA, Meyerhardt JA, Garrett WS, Huttenhower C, Meyerson M, Giovannucci EL, Fuchs CS, Nishihara R, Ogino S. Fusobacterium nucleatum in Colorectal Carcinoma Tissue According to Tumor Location. Clin Transl Gastroenterol. 2016 Nov 3;7(11):e200.

21. Bullman S, Meyerson M, **Kostic AD**. Emerging Concepts and Technologies for the Discovery of Microorganisms Involved in Human Disease. Annu Rev Pathol. 2017 Jan 24;12:217-244.

22. Mehta RS, Nishihara R, Cao Y, Song M, Mima K, Qian ZR, Nowak JA, Kosumi K, Hamada T, Masugi Y, Bullman S, Drew DA, **Kostic AD**, Fung TT, Garrett WS, Huttenhower C, Wu K, Meyerhardt JA, Zhang X, Willett WC, Giovannucci EL, Fuchs CS, Chan AT, Ogino S. Association of Dietary Patterns With Risk of Colorectal Cancer Subtypes Classified by Fusobacterium Nucleatum in Tumor Tissue. JAMA Oncol. 2017 Jan 26.

Non-peer reviewed scientific or medical publications/materials in print or other media

Professional educational materials or reports, in print or other media

Clinical Guidelines and Reports

Thesis

Kostic, A. D. (2013). *Deep sequencing and functional analyses identify a role of Fusobacterium species in colorectal tumorigenesis* (Doctoral Dissertation). Harvard University; Cambridge, MA. Retreived from Digital Access to Scholarship at Harvard: http://nrs.harvard.edu/urn-3:HUL.InstRepos:11129202

Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings

Narrative Report (limit to 500 words)

My research combines computational and experimental expertise to probe the relationship between the human microbiome and diseases including type 1 diabetes and colorectal cancer. I strive to generate a high-level understanding of how the molecular interactions between the immune system and the intestinal microbiome regulate human health. My background and training spans computational biology, microbiology, and immunology in equal measure. This unique skillset has led to me to find novel associations and mechanisms linking metagenomics, immunity, and human disease. In addition, this experience makes me well suited to educating and training young scientists with a diverse, multidisciplinary skillset. During my PhD thesis work, I discovered an association between colorectal cancer and the gut microbiome constituent *Fusobacterium nucleatum*. To my astonishment at the time, *Fusobacterium* accelerated intestinal tumorigenesis by a mechanism involving altered immune cell recruitment to the tumor, which I established after developing a mouse model with a humanized microbiome. As a postdoctoral fellow, I worked to characterize the developing infant gut microbiome in dense, longitudinal metagenomic analyses of birth cohorts at risk for type 1 diabetes. In my latest publication, I provide the first evidence and mechanism by which the human microbiome directly influences immune development and progression to type 1 diabetes. This work is being adapted in the first clinical trial, to my knowledge, of a microbiome-based therapy in type 1 diabetes. My ultimate research goal is to develop new methods to diagnose and treat type 1 diabetes by deepening our understanding of the immunomodulatory effects of the diverse constituents of the symbiotic microbiota and their impact on autoimmunity.