

## Purvesh Khatri

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Stanford, CA 94305  
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### Academic Appointments

- 2018 Associate Professor (May 1, 2018 – Present)  
Stanford Institute for Immunity, Transplant and Infection  
Center for Biomedical Informatics Research  
Department of Medicine, Stanford University
- 2014 Assistant Professor (October 1, 2014 – April 30, 2018)  
Stanford Institute for Immunity, Transplant and Infection  
Center for Biomedical Informatics Research  
Department of Medicine, Stanford University
- 2013 Acting Assistant Professor (April 1, 2013 – September 30, 2014)  
Stanford Institute for Immunity, Transplant and Infection  
Center for Biomedical Informatics Research  
Department of Medicine, Stanford University
- 2011 Research Associate (April 1, 2011 - March 31, 2013)  
Divisions of Systems Medicine and Nephrology  
Department of Pediatrics, Stanford University
- 2008 Postdoctoral Scholar (July 1, 2008 - March 31, 2011)  
Center for Biomedical Informatics Research (BMIR)  
Departments of Pediatrics and Medicine, Stanford University
- 2008 Part-time Faculty (January 2008 - April 2008)  
Department of Computer Science, Wayne State University
- 2006 Postdoctoral Fellow (August 2006 - June 2008)  
Intelligent Systems and Bioinformatics Laboratory  
Department of Computer Science, Wayne State University
- 2000 Research Assistant (July 2000 - August 2006)  
Intelligent Systems and Bioinformatics Laboratory  
Department of Computer Science, Wayne State University
- 2003 Research Scientist (January 2003 - June 2004)  
Bioinformatics cell, Telemedicine and Advanced Technology Research Center, US Army Medical  
Research and Materiel Command
- 2002 Teaching Assistant (August 2002 - December 2002)  
Department of Computer Science, Wayne State University
- 2000 Research Assistant (July 2000 - August 2002)  
Center for Molecular Medicine and Genetics, Wayne State University

### Education

- 2006 Ph.D. in Computer Science  
Wayne State University, Detroit, MI  
Thesis: Onto-Tools: Tools for Functional Design and Interpretation of High Throughput Gene  
Expression Data
- 2006 M.S. Computer Science  
Wayne State University, Detroit, MI

Thesis: Onto-Express: Tool for Functional Profiling of Gene Expression Data

1998 B.Eng. in Electronics Engineering  
B.V.M. Engineering College, Sardar Patel University, Gujarat, India

## Awards and Honors

- 2016 Selected one of the top 10 science advances of 2016 by NIAID for Andres-Terre *et al.* Immunity 2015
- 2016 Teaching award, Department of Medicine, Stanford University
- 2010 “Young Investigator Award” at American Transplant Congress 2010 for Meta-analysis of Solid Organ Transplant Data Sets Identifies Differentially Expressed microRNAs common in Heart, Kidney and Liver Allografts. (35 recipients out of more than 4,400 applicants worldwide)
- 2005 “Fast Breaking Paper” award in the field of Computer Science (Bioinformatics) for Khatri *et al.* Bioinformatics 2005 Sep; 21(18): 3587-3595 by ISI Thomson-Scientific Essential Science Indicator. According to ISI Thomson, these papers comprise the top 1% of papers in each field and each year (<http://esi-topics.com/fbp/2006/october06-SorinDraghici.html>)
- 2004 Graduate Research Assistant Recognition Award. Department of Computer Science, Wayne State University, Detroit, MI, April 2004
- 2003 Graduate Research Assistant Recognition Award. Department of Computer Science, Wayne State University, Detroit, MI, April 2003
- 2002 Graduate Research Assistant Recognition Award. Department of Computer Science, Wayne State University, Detroit, MI, April 2002

## Scientific Committee Member

- 2012 Scientific Program Committee member for the Eighth International Conference on Data Integration in the Life Sciences (DILS 2012). June 28-29, 2012, University of Maryland, College Park, MD, USA.
- 2012 Scientific Program Committee member for the AMIA Summit on Translational Bioinformatics (TBI 2012). March 18-20, 2012. San Francisco, CA, USA.
- 2010 Chair for Special session on Machine Learning Applications in Bioinformatics and Computational Biology for the International Conference on Machine Learning and Applications (ICMLA) 2010. 12-14 Dec. 2010, Washington D.C., USA.  
([http://www.icmla-conference.org/icmla10/CFP\\_SpecialSession7.html](http://www.icmla-conference.org/icmla10/CFP_SpecialSession7.html))
- 2009 Technical committee member for Special session on Machine Learning Applications in Bioinformatics and Computational Biology for the International Conference on Machine Learning and Applications (ICMLA) 2009.

## Ad hoc Reviewer

Cell, Nature, Lancet, Cell Host & Microbe, Lancet Respiratory Medicine, Nature Medicine, Nature Biotechnology, Science Translational Medicine, Nucleic Acids Research, Public Library of Science (PLOS) Computational Biology, Bioinformatics, BMC Bioinformatics, BMC Genomics, BMC Medical Genomics, IEEE/ACM Transactions on Computational Biology and Bioinformatics, Journal of Biomedical Informatics, EMBO Molecular Medicine, Infection, Genetics and Evolution, Computational Statistics and Data Analysis, Drug Discovery Today, BioSystems

## Students and Postdoc Mentoring

1. Kalani Ratnasiri, Immunology, PhD, Research advisor (September 2020 – Present)
2. Larry Kalesinskas, Biomedical Informatics, PhD, Research advisor (January 2018 – Present)
3. Umay Geicki, Electrical Engineering, PhD, Research advisor (– Present)
4. Ananthkrishnan Ganesan, ICME, PhD, Research advisor (May 2018 – Present)

5. Aditya Rao, Immunology, PhD, Research advisor (January 2017 – Present)
6. Lawrence Bai, Immunology, PhD, Research co-advisor (June 2017 – Present)
7. Madeleine Scott, MSTP, Research advisor (July 2016 – Present)
8. Kelly McGill, Immunology, PhD, Research co-advisor (with PJ Utz; January 2016 – Present)
9. Jiaying Toh, Immunology, PhD, Research co-advisor (with Olivia Martinez; April 2016 – Present)
10. Winn Haynes, Biomedical Informatics, PhD, Research co-advisor (with PJ Utz; February 2014 – Present)
11. Erika Bongen, Immunology, PhD, Research co-advisor (with PJ Utz; March 2014 – Present)
12. Marta Andres-Terre, Immunology, PhD, Research co-advisor (with Denise Monack; December 2013 – Present)
13. Tim Sweeney, Biomedical Informatics and resident (surgery), Research advisor (August 2013 – September 2015)
14. Matthew Daniel Li, Stanford Medical Student, 2nd year, Research advisor (July 2013 – May 2016)
15. Charles Liu, Volunteer and Stanford SIMR program, Research advisor (January 2012 – January 2014)
16. Andrew Liu, Stanford SIMR program, Research advisor (June 2010 - April 2011)

## Publications

### Peer-reviewed Journal Publications (indexed in PubMed)

1. Lauren E. Higdon\*, Steven Schaffert\*, Rachel H. Cohen, Maria E. Montez-Rath, Marc Lucia, Naresha Saligrama, Kenneth B. Margulies, Olivia M. Martinez, Jane C. Tan, Mark M. Davis, **Purvesh Khatri**<sup>§</sup>, Jonathan S. Maltzman<sup>§</sup>. *Functional consequences of memory inflation after solid-organ transplantation*. Journal of Immunology (in press). <sup>§</sup>Co-senior authors, \*Co-first authors
2. Lauren E. Higdon\*, Steven Schaffert\*, Huang Huang, Maria E. Montez-Rath, Marc Lucia, Alok Kumar Jha, Naresha Saligrama, Kenneth B. Margulies, Olivia M. Martinez, Mark M. Davis, **Purvesh Khatri**<sup>§</sup>, Jonathan S. Maltzman<sup>§</sup>. *Evolution of cytomegalovirus-responsive T cell clonality following solid-organ transplantation*. Journal of Immunology (in press). <sup>§</sup>Co-senior authors, \*Co-first authors
3. Lawrence Bai\*, Madeleine KD Scott\*, Ethan Steinberg, Aida Habtezion, Nigam Shah, **Purvesh Khatri**. *Molecular and clinical data integration identifies protective effects of atorvastatin in patients with Ulcerative Colitis*. JAMIA 2021 (in press).
4. Prabhu S. Arunachalam\*, Madeleine K. D. Scott\*, Thomas Hagan\*, Chunfeng Li, Florian Wimmers, Yupeng Feng, Lilit Grigoryan, Meera Trisal, Venkata Viswanadh Edara, Lilin Lai, Sarah Esther Chang, Allan Feng, Shaurya Dhingra, Mihir Shah, Allie Skye Lee, Natalia Sigal, Sangeeta Kowli, Sheena Gupta, Kathryn Pellegrini, Sofia Maysel-Auslender, Steven Bosinger, Holden T. Maecker, Scott D. Boyd, Mark M. Davis, Paul J. Utz, Mehul S. Suthar, **Purvesh Khatri**<sup>§</sup>, Kari C. Nadeau<sup>§</sup>, Bali Pulendran<sup>§</sup>. *Systems biological assessment of human immunity to BNT162b2 mRNA vaccination*. Nature 2021 <sup>§</sup>Co-senior authors. \*Co-first authors.
5. Alexandra J. Zimmer\*, Samuel G. Schumacher\*, Erik Södersten, Anna Mantsoki, Romain Wyss, David H. Persing, Sara Banderby, Linda Strömqvist Meuzelaar, Jacqueline Prieto, Devasena Gnanashanmugam, **Purvesh Khatri**, Stefano Ongarello, Morten Ruhwald<sup>§</sup>, Claudia M. Denking<sup>§</sup>. *A novel blood-based assay for treatment monitoring of tuberculosis*. BMC Research Notes 2021 <sup>§</sup>Co-senior authors, \*Co-first authors.
6. Andrew R Moore, Jonasel Roque, Brian T Shaller, Tola Asuni, Melissa Rimmel, David Rawling, Oliver Liesenfeld, **Purvesh Khatri**, Jennifer G Wilson, Joseph E Levitt, Timothy E Sweeney, Angela J Rogers. *Prospective validation of an 11-gene mRNA host response score for mortality risk stratification in the intensive care unit*. Scientific Report 2021 (in press).
7. Florian Wimmers, Michele Donato\*, Alex Kuo\*, Tal Ashuach\*, Shakti Gupta, Chunfeng Li, Mai Dvorak, Mariko Hinton Foecke, Sarah E. Chang, Sanne E. De Jong, Holden T. Maecker, Robbert van der Most, Peggie Cheung, Mario Cortese, Thomas L. Hagan, Steve Bosinger, Mark Davis, Nadine Roupheal, Shankar Subramaniam, Nir Yosef, Paul J. Utz, **Purvesh Khatri**, Bali Pulendran. *Single-cell*

*analysis of the epigenomic and transcriptional landscape of innate immunity to seasonal and adjuvanted pandemic influenza vaccination in humans.* Cell 2021 (accepted for publication).

8. Peggie Cheung\*, Steven Schaffert\*, Sarah E. Chang\*, Mai Dvorak, Michele Donato, Claudia Macaubas, Mariko H. Foecke, Tie-Mei Li, Lichao Zhang, John P. Coan, Grant S. Schulert, Alexei A. Grom, Lauren A. Henderson, Peter A. Nigrovic, Joshua E. Elias, Or Gozani, Elizabeth D. Mellins<sup>§</sup>, **Purvesh Khatri**<sup>§</sup>, Paul J. Utz<sup>§</sup>, Alex J. Kuo<sup>§</sup>. *Repression of CTSG, ELANE, AND PRTN3-mediated histone H3 proteolytic cleavage promotes monocyte-to-macrophage differentiation.* Nature Immunology 2021 (accepted for publication). <sup>§</sup>Co-senior authors. \*Co-first authors.
9. Kerui Peng, Yana Safonova, Mikhail Shugay, Alice Popejoy, Oscar L Rodriguez, Felix Breden, Petter Brodin, Amanda M Burkhardt, Carlos Bustamante, Van-Mai Cao-Lormeau, Martin M Corcoran, Darragh Duffy, Macarena Fuentes Guajardo, Ricardo Fujita, Victor Greiff, Vanessa D Jönsson, Xiao Liu, Lluís Quintana-Murci, Maura Rossetti, Jianming Xie, Gur Yaari, Wei Zhang, Malak S Abedalthagafi, Khalid O Adekoya, Rahaman A Ahmeda, Wei-Chiao Chang, Clive Gray, Yusuke Nakamura, William D Lees, **Purvesh Khatri**, Houda Alachkar, Cathrine Scheepers, Corey T Watson, Gunilla B Karlsson Hedestam, Serghei Mangul. *Diversity in immunogenomics: the value and the challenge.* Nature Methods 2021 (accepted for publication).
10. Francesco Vallania, Liron Zisman, Claudia Macaubas, Shu-Chen Hung, Narendiran Rajasekaran, Sonia Mason, Jonathan Graf, Mary Nakamura, Elizabeth D. Mellins<sup>§</sup> and **Purvesh Khatri**<sup>§</sup>. *Multicohort Analysis Identifies Monocyte Gene Signatures to Accurately Monitor Subset-Specific Changes in Human Diseases.* Frontiers in Immunology 2021, 12:1732. <sup>§</sup>Co-senior authors.
11. Mingxia Gu, Michele Donato, Minzhe Guo, Neil Wary, Yifei Miao, Shuai Mao, Toshie Saito, Shoichiro Otsuki, Lingli Wang, Rebecca L. Harper, Silin Sa, **Purvesh Khatri**, Marlene Rabinovitch. *Phenotypic drug screening in iPSC-endothelial cells within silico analyses identifies tyrphostin AG1296 for pulmonary arterial hypertension.* Science Translational Medicine 2021, 13:eaba6480.
12. Simone Thair\*, Caspar Mewes\*, José Hinz, MD, Ingo Bergmann, Benedikt Büttner, Stephan Schmisch, Konrad Meissner, Michael Quintel, Timothy E Sweeney, **Purvesh Khatri**<sup>§</sup> and Ashham Mansur<sup>§</sup>. *Gene-expression based diagnosis of infections in critically ill patients – prospective validation of the SepsisMetaScore in a longitudinal severe trauma cohort.* Critical Care Medicine 2021 (published online ahead of print). \*Co-first authors. <sup>§</sup>Co-senior authors.
13. Lara Murphy Jones and **Purvesh Khatri**. *Multisystem Inflammatory Syndrome in Children (MIS-C): a microcosm of challenges and opportunities for translational bioinformatics in pediatrics research.* Current Opinions in Pediatrics 2021, 33(3):325-330.
14. Cesar J. Lopez Angel, Edward A. Pham, Huixun Du, Francesco Vallania, Benjamin J. Fram, Kevin Perez, Thai Nguyen, Yael Rosenberg-Hasson, Aijaz Ahmed, Cornelia L. Dekker, Philip M. Grant, **Purvesh Khatri**, Holden T. Maecker, Jeffrey S. Glenn, Mark M. Davis and David Furman. *Signatures of immune dysfunction in HIV and HCV infection share features with chronic inflammation in aging and persist after viral reduction or elimination.* Proceedings of the National Academy of Sciences 2021, 18(14):e2022928118.
15. Hong Zheng\*, Aditya M Rao\*, Denis Dermadi\*, Jiaying Toh\*, Lara Murphy Jones\*, Michele Donato\*, Yiran Liu, Yapeng Su, Minas Karagiannis, Theodoros Marantos, Yehudit Hasin-Brumshtein, Yudong D He, Evangelos J Giamarellos-Bourboulis, Jim Heath, **Purvesh Khatri**. *Multi-cohort analysis of host immune response identifies conserved protective and detrimental modules associated with severity across viruses.* Immunity 2021, 54:753-768.
16. Flora Martinez Figueira Moreira, Renu Verma, Paulo Cesar Pereira dos Santos, Alessandra Leite, Andrea da Silva Santos, Rafaela Carla Pivetta de Araujo, Bruna Oliveira da Silva, Júlio Henrique Ferreira de Sá Queiroz, David H. Persing, Erik Södersten, Devasena Gnanashanmugam, **Purvesh Khatri**, Julio Croda, Jason R. Andrews. *Blood-based host biomarker diagnostics in active case finding for pulmonary tuberculosis: A diagnostic case-control study.* EClinicalMedicine 2021, 33:100776.
17. Erik Södersten, Stefano Ongarello, Ann Mantsoki, Romain Wyss, David H Persing, Sara Banderby, Linda Strömquist Meuzelaar, Jacqueline Prieto, Devasena Gnanashanmugam, **Purvesh Khatri**, Samuel

- G Schumacher, Samuel G, Claudia M Denkinger. *Diagnostic accuracy study of a novel blood-based assay for identification of TB in people living with HIV*. Journal of Clinical Microbiology 2021, 59(3):06143-20.
18. Adriana Tomic,\* Ivan Tomic,\* Levi Waldron, Ludwig Geistlinger, Max Kuhn, Rachel L. Spreng, Lindsay C. Dahora, Kelly E. Seaton, Georgia Tomaras, Jennifer Hill, Niharika A. Duggal, Ross D. Pollock, Norman R. Lazarus, Stephen D.R. Harridge, Janet M. Lord, **Purvesh Khatri**, Andrew J. Pollard, and Mark M. Davis. *SIMON: Opensource Knowledge Discovery Platform*. Patterns 2021, 2(1):100178.
  19. Madeleine K. D. Scott, Michael G. Ozawa, Pauline Chu, Maneesha Limaye, Viswam S. Nair, Steven Schaffert, Albert C. Koong, Robert West, **Purvesh Khatri**. *A multi-scale integrated analysis identifies KRT8 as a pan-cancer early biomarker*. Pacific Symposium on Biocomputing 2021, 26:297-308.
  20. Simone A. Thair, Yudong D. He, Yehudit Hasin-Brumshtein, SurajSakaram, Rushika Pandya, Jiaying Toh, David Rawling, Melissa Remmel, Sabrina Coyle, George N. Dalekos, Ioannis Koutsodimitropoulos, Glykeria Vlachogianni, Eleni Gkeka, Eleni Karakike, Georgia Damoraki, Nikolaos Antonakos, **Purvesh Khatri**<sup>§</sup>, Evangelos J. Giamarellos-Bourboulis<sup>§</sup>, Timothy E. Sweeney<sup>§</sup>. *Transcriptomic similarities and differences in host response between SARS-CoV-2 and other viral infections*. iScience 2020, 24(1):101947. <sup>§</sup>Co-senior author.
  21. Prabhu S. Arunachalam\*, Florian Wimmers\*, Chris Ka Pun Mok\*, Ranawaka A. P. M. Perera\*, Madeleine Scott, Thomas Hagan, Natalia Sigal, Yupeng Feng, Laurel Bristow, Owen Tak-Yin Tsang, Dhananjay Wagh, John Coller, Kathryn L. Pellegrini, Dmitri Kazmin, Ghina Alaaeddine, Wai Shing Leung, Jacky Man Chun Chan, Thomas Shiu Hong Chik, Chris Yau Chung Choi, Christopher Huerta, Michele Paine McCullough, Huibin Lv, Evan Anderson, Srilatha Edupuganti, Amit A. Upadhyay, Steve E. Bosinger, Holden Terry Maecker, **Purvesh Khatri**, Nadine Rouphael, Malik Peiris, Bali Pulendran. *Systems biological assessment of immunity to mild versus severe COVID-19 infection in humans*. Science 2020, 369(6508):1210-1220.
  22. Diederik E van der Feen, Guido PL Bossers, Quint AJ Hagdorn, Jan-Renier Moonen, Kondababu Kurakula, Robert Szulcek, James Chappell, Francesco Vallania, Michele Donato, Klaas Kok, Jaskaren S Kohli, Arjen H Petersen, Tom van Leusden, Marco Demaria, Marie-José TH Goumans, Rudolf A De Boer, **Purvesh Khatri**, Marlene Rabinovitch, Rolf MF Berger, Beatrijs Bartelds. *Cellular senescence impairs the reversibility of pulmonary arterial hypertension*. Science Translational Medicine 2020, 12:5r4(eaaw4974).
  23. Eli M Cahan and **Purvesh Khatri**. *Data Heterogeneity: The Enzyme to Catalyze Translational Bioinformatics?* Journal of Medical Internet Research 2020, 22(8):e18044.
  24. Prabhu S. Arunachalam, Tysheena P. Charles, Vineet Joag, Venkata S. Bollimpelli, Madeleine K. D. Scott, Florian Wimmers, Samantha L. Burton, Celia C. Labranche, Caroline Petitdemange, Sailaja Gangadhara, Tiffany M. Styles, Clare F. Quarnstrom , Korey A. Walter, Thomas J. Ketas, Traci Legere, Pradeep Babu Jagadeesh Reddy, Sudhir Pai Kasturi, Anthony Tsai, Bertrand Z. Yeung, Shakti Gupta, Mark Tomai, John Vasilakos, George M. Shaw, Chil-Yong Kang, John P. Moore, Shankar Subramaniam, **Purvesh Khatri**, David Montefiori, Pamela A. Kozlowski , Cynthia A. Derdeyn, Eric Hunter, David Masopust, Rama R. Amara and Bali Pulendran. *T cell-inducing vaccine durably prevents mucosal SHIV infection even with lower neutralizing antibody titers*. Nature Medicine 2020.
  25. Vivian E Saper, Guangbo Chen, R Paul Guillerman, **Purvesh Khatri**, Randy Q Cron, Elizabeth D Mellins. *Response to: 'Successful treatment of plasma exchange for refractory systemic juvenile idiopathic arthritis complicated with macrophage activation syndrome and severe lung disease' by Sato et al*. Annals of Rheumatic Diseases 2020.
  26. Chase Correia, Seamus Mawe, Shane Lofgren, Roberta G. Marangoni, Jungwha Lee, Rana Saber, Kathleen Aren, Michelle Cheng, Shannon Teaw, Aileen Hoffmann, Isaac Goldberg, Shawn E. Cowper, **Purvesh Khatri**, Monique Hinchcliff & J. Matthew Mahoney. *High-throughput quantitative histology in systemic sclerosis skin disease using computer vision*. Arthritis Research & Therapy 2020, 22:48.
  27. Michael B. Mayhew, Ljubomir Buturovic, Roland Luethy, Uros Midic, Andrew R. Moore, Jonasel A. Roque, Brian D. Shaller, Tola Asuni, David Rawling, Melissa Remmel, Kirindi Choi, James Wacker, **Purvesh Khatri**, Angela J. Rogers & Timothy E. Sweeney. *A generalizable 29-mRNA neural-network classifier for acute bacterial and viral infections*. Nature Communications 2020, 11:1177.

28. Vivian E Saper, Guangbo Chen, **Purvesh Khatri**, Elizabeth D Mellins. *Response to: 'Effectiveness and safety of ruxolitinib for the treatment of refractory systemic idiopathic juvenile arthritis like associated with interstitial lung disease: case report'*. Annals of Rheumatic Diseases 2020, (in press, published online).
29. Winston A. Haynes, D. James Haddon, Vivian K. Diep, Avani Khatri, Erika Bongen, Gloria Yiu, Imelda Balboni, Christopher R. Bolen, Rong Mao, Paul J. Utz<sup>§</sup>, Purvesh Khatri<sup>§</sup>. *Integrated, Multi-Cohort Analysis Reveals Unified Signature of Systemic Lupus Erythematosus*. JCI Insight 2020, 5(4):e122312. <sup>§</sup>co-senior authors.
30. Blake J Schultz, Timothy Sweeney, Malcolm R DeBaun, Melissa Rimmel, Uros Midic, **Purvesh Khatri**, Michael J Gardner. *Pilot study of a novel serum mRNA gene panel for diagnosis of acute septic arthritis*. World Journal of Orthopedics 2019, 10(12):424-433.
31. Vivian E. Saper\*, Guangbo Chen\*, Gail H. Deutsch<sup>†</sup>, R Paul. Guillerman<sup>†</sup>, Johannes Birgmeier<sup>||</sup>, Karthik Jagadeesh<sup>||</sup>, Scott Canna<sup>‡</sup>, Grant Schulert<sup>‡</sup>, Robin Deterding, Jianpeng Xu, Ann N. Leung, Layla Bouzoubaa, Khalid Abulaban, Kevin Baszis, Edward M Behrens, James Birmingham, Alicia Casey, Michal Cidon, Randy Cron, Aliva De, Fabrizio De Benedetti, Ian Ferguson, Martha P. Fishman, Steven I. Goodman, Brent Graham, Alexei Grom, Kathleen Haines, Melissa Hazen, Lauren A. Henderson, Assunta Ho, Maria Ibarra, CJ Inman, Rita Jerath, Khulood Walid Khawaja, Daniel J Kingsbury, Marisa Klein-Gitelman, Khan Lai, Sivia Lapidus, Clara Lin, Jenny Lin, Deborah R. Liptzin, Diana Milojevic, Joy Mombourquette, Karen Onel, Seza Ozen, Maria Perez, Kathryn Phillippi, Sampath Prahalad, Suhas Radhakrishna, Adam Reinhardt, Mona Riskalla, Natalie Rosenwasser, Johannes Roth, Rayfel Schneider, Dienneke Schonenberg-Meinema, Susan Shenoi, Judith A Smith, Hafize Emine Sonmez, Matthew L. Stoll, Christopher Towe, Sara O. Vargas, Richard K. Vehe, Lisa R. Young, Jacqueline Yang, Tushar Desai, Raymond Balise, Ying Lu, Lu Tian, Gil Bejerano, Mark M. Davis, **Purvesh Khatri**<sup>§</sup>, Elizabeth D. Mellins<sup>§</sup> and the Childhood Arthritis and Rheumatology Research Alliance Registry Investigators. *Emergent high fatality lung disease in systemic juvenile arthritis*. Annals of Rheumatic Diseases 2019 (online first). \*Co-first authors. <sup>§</sup>co-senior authors.
32. Erika Bongen, Hayley Lucian, Avani Khatri, Gabriela K Fragiadakis, Zachary B Bjornson, Gary P Nolan, Paul J Utz<sup>§</sup>, **Purvesh Khatri**<sup>§</sup>. *Sex Differences in the Blood Transcriptome Identify Robust Changes in Immune Cell Proportions with Aging and Influenza Infection*. Cell Reports 2019, 29(7):1961-1973. <sup>§</sup>Co-senior authors.
33. Mathieu Le Gars, Christof Seiler, Alexander W. Kay, Nicholas L. Bayless, Elina Starosvetsky, Lindsay Moore, Shai S. Shen-Orr, Natali Aziz, **Purvesh Khatri**, Cornelia L. Dekker, Gary E. Swan, Mark M. Davis, Susan Holmes, Catherine A. Blish. *Pregnancy-Induced Alterations in NK Cell Phenotype and Function*. Frontiers in Immunology 2019, 10:2469.
34. Zinaida Good, Jacob Glanville, Marvin H Gee, Mark M Davis, **Purvesh Khatri**. *Computational and Systems Immunology: A Student's Perspective*. Trends in immunology 2019, 40(8):665-668.
35. Madeleine K D Scott, Katie Quinn, Qin Li, Robert Carroll, Hayley Warsinske, Francesco Vallania, Shirley Chen, Mary A Carns, Kathleen Aren, Jiehuan Sun, Kimberly Koloms, Jungwha Lee, Jessika Baral, Jonathan Kropski, Hongyu Zhao, Erica Herzog, Fernando J Martinez, Bethany B Moore, Monique Hinchcliff, Joshua Denny, Naftali Kaminski, Jose D Herazo-Maya, Nigam H Shah<sup>§</sup>, **Purvesh Khatri**<sup>§</sup>. *Increased monocyte count as a cellular biomarker for poor outcomes in fibrotic diseases: a retrospective, multicentre cohort study*. The Lancet Respiratory Medicine 2019, 7(6):497-508. <sup>§</sup>Co-senior authors.
36. Peggie Cheung, **Purvesh Khatri**, Paul J Utz, Alex Kuo. *Single-cell technologies — studying rheumatic diseases one cell at a time*. Nature Reviews Rheumatology 2019, 15:340-354.
37. Lauren E Higdon\*, Steven Schaffert\*, **Purvesh Khatri**<sup>§</sup>, Jonathan S Maltzman<sup>§</sup>. *Single-cell immune profiling in transplantation research*. American Journal of Transplantation 2019, 19:1278-1287. \*Contributed equally. <sup>§</sup>Co-senior authors.
38. Hayley Warsinske, Rohit Vashisht, **Purvesh Khatri**. *Host-response-based gene signatures for tuberculosis diagnosis: A systematic comparison of 16 signatures*. PLoS Medicine 2019, 16(4):e1002786.
39. John V. Pluvinae, Michael S. Haney, Benjamin A. H. Smith, Jerry Sun, Tal Iram, Liana Bonanno, Lulin Li, Davis P. Lee, David W. Morgens, Andrew C. Yang, Steven R. Shuken, David Gate, Madeleine Scott, **Purvesh Khatri**, Jian Luo, Carolyn R. Bertozzi, Michael C. Bassik & Tony Wyss-Coray. *CD22 blockade restores homeostatic microglial phagocytosis in ageing brains*. Nature 2019, 558:187-192.



40. Ayelet Alpert, Yishai Pickman, Michael Leipold, Yael Rosenberg-Hasson, Xuhuai Ji, Renaud Gaujoux, Hadas Rabani, Elina Starosvetsky, Ksenya Kveler, Steven Schaffert, David Furman, Oren Caspi, Uri Rosenschein, **Purvesh Khatri**, Cornelia L. Dekker, Holden T. Maecker, Mark M. Davis, Shai S. Shen-Orr. *A clinically meaningful metric of immune age derived from high-dimensional longitudinal monitoring*. Nature Medicine 2019, 25:487-495.
41. Andrew J. Sweatt, Haley K. Hedlin, Vidhya Balasubramanian, Andrew Hsi, Lisa K. Blum, William H. Robinson, Francois Haddad, Allan Lawrie, Mark R. Nicolls, Marlene Rabinovitch, **Purvesh Khatri**, Roham T. Zamanian. *Identification of deep immune phenotypes in pulmonary arterial hypertension with unsupervised machine learning*. Circulation Research 2019,124:904–919.
42. Makeda Robinson\*, Timothy E. Sweeney\*, Rina Barouch-Bentov, Malaya Kumar Sahoo, Larry Kalesinskas, Francesco Vallania, Ana Maria Sanz, Eliana Ortiz-Lasso, Ludwig Luis Albornoz, Fernando Rosso, Jose G. Montoya, Benjamin A. Pinsky, **Purvesh Khatri**<sup>§</sup>, Shirit Einav<sup>§</sup>. *A novel prognostic gene set for the prediction of severe dengue*. Cell Reports 2019, 26(5):1104-1111. \*Contributed equally. <sup>§</sup>Co-corresponding authors.
43. Svenja Dannewitz Prosseda, Xuefei Tian, Kazuya Kuramoto, Mario Boehm, Deepti Sudheendra, Kazuya Miyagawa, Fan Zhang, David Solow-Cordero, Joshua Saldivar, Eric Austin, James E. Loyd, Lisa Wheeler, Adam Andruska, Lingli Wang, Kay Huebner, Ross Metzger, **Purvesh Khatri**, Edda Spiekerkoetter. *Fragile Histidine Triad (FHIT), a novel modifier gene in pulmonary arterial hypertension*. American Journal of Respiratory and Critical Care Medicine 2019, 199(1):83-98.
44. Steven Schaffert, **Purvesh Khatri**. *Early life immunity in the era of systems biology: understanding development and disease*. Genome Medicine 2018 10:88.
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## Book Chapters

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2. **Purvesh Khatri**, Sorin Draghici, Adi L. Tarca, Sonia S. Hassan, Roberto Romero. *A system biology approach for the steady-state analysis of gene signalling networks*. 12th Iberoamerican Congress on Pattern Recognition, CIARP 2007, Valparaiso, Chile. November 13-16, **2007**
3. Bogdan Done, **Purvesh Khatri**, Arina Done, Sorin Draghici. *Semantic analysis of genome annotations using weighting schemes*. 2007 IEEE Symposium on Computational Intelligence in Bioinformatics and Computational Biology (IEEE CIBCB 2007). Honolulu, Hawaii, April 1-5, **2007**
4. Valmik Desai, **Purvesh Khatri**, Arina Done, Aviva Friedman, Michael Tainsky, and Sorin Draghici. *A Novel Bioinformatics Technique for Predicting Condition-Specific Transcription Factor Binding Sites*. 2006 IEEE Symposium on Computational Intelligence in Bioinformatics and Computational Biology (IEEE CIBCB 2005). San Diego, CA. November 14-15, **2005**

## Conference Podium Presentations

1. Francesco Vallania, Andrew Tam, Shane Lofgren, Steven Schaffert, Erika Bongen, Michael Alonso, Mark Davis, Ed Engleman and **Purvesh Khatri**. *Leveraging heterogeneity in public data to reduce bias and increase accuracy of cell-mixture deconvolution*. ISMB July 2017, Prague.
2. Winston Haynes, Rohit Vashisht, Francesco Vallania, Greg Caskins, Charles Liu, Erika Bongen, Shane Lofgren, Paul J Utz, Timothy E Sweeney, Nigam Shah, and **Purvesh Khatri**. *Understanding human disease relationships through integrated molecular and clinical analysis*. ISMB July 2017, Prague.
3. Michele Donato, Tej Deepak Azad, Line Heylen, Shai Shen-Orr, Timothy Sweeney, Maarten Naesens, **Purvesh Khatri**. *Dysregulated innate immune response is a robust marker of allograft injury and survival across all transplanted organs*. AMIA-TBI March 27, **2017**.
4. Shane Lofgren, Monique Hinchcliff, Mary Carns, Tammara Wood, Kathleen Aren, Esperanza Arroyo, Peggie Cheung, Alex Kuo, Antonia Valenzuela, Anna Haemel, Paul Wolters, Jessica Gordon, Robert Spiera, Shervin Assassi, Francesco Boin, Lorinda Chung, David Fiorentino, PJ Utz, Michael Whitfield, **Purvesh Khatri**. *Multi-cohort Analysis of Systemic Sclerosis Identifies Robust Transcriptional Signature of Disease Severity*. AMIA-TBI March 27, **2017**.
5. Erika Bongen, Francesco Vallania, PJ Utz, Timothy Sweeney, **Purvesh Khatri**. *Sex differences in immune system gene expression*. AMIA-TBI March 27, **2017**.
6. Winston Haynes, Rohit Vashisht, Francesco Vallania, Charles Liu, Greg Gaskin, Erika Bongen, Shane Lofgren, Timothy Sweeney, PJ Utz, Nigam Shah, **Purvesh Khatri**. *Understanding human disease relationships through integrated molecular and clinical analysis*. AMIA-TBI March 27, **2017**.
7. Aurelie Tomczak, Jonathan Mortensen, Rainer Winnenburg, Winston Haynes, Charles Liu, Dominique Alessi, Francesco Vallania, Shane Lofgren, Varsha Swamy, Nigam Shah, Mark Musen, **Purvesh Khatri**. *Effect of evolution of the Gene Ontology on interpretation of experiments: implications for reproducibility*. AMIA-TBI March 27, **2017**.
8. Francesco Vallania, Andrew Tam, Shane Lofgren, Michael Alonso, Edgar Engleman, **Purvesh Khatri**. *immunoStates: a new strategy to remove platform and disease bias in cell- mixture deconvolution*. AMIA-TBI March 27, **2017**.

9. Timothy E Sweeney, Aaditya Shidham, Hector R Wong, **Purvesh Khatri**. A Comprehensive Time-Course-Based Meta-Analysis of Sepsis and Sterile Inflammation Reveals a Robust Diagnostic Gene Set. AMIA-TBI Mar 25, **2015**.
10. Timothy E Sweeney, Aaditya Shidham, Hector R Wong, **Purvesh Khatri**. "1002: A Comprehensive Time-Course-Based Meta-Analysis of Sepsis and Sterile Inflammation Reveals a Robust Discriminatory Gene Set". Critical Care Medicine 42 (12), A1601, **2014**.
11. Timothy E Sweeney, **Purvesh Khatri**. Gene Expression Can Robustly Separate Infectious and Non-Infectious Inflammation. Journal of the American College of Surgeons 219 (3), S43. American College of Surgeons Clinical Congress, **2014**.
12. Michael Januszzyk, Michael Sorkin, Robert C. Rennert, Geoffrey C. Gurtner, **Purvesh Khatri**, Atul J. Butte. *Identification of Transcriptionally-Defined Cancer Subpopulations Through Integration of Public Microarray Data with Single Cell Gene Expression Profiling*. AMIA 2014 Joint Summits on Translational Science, **2014**.
13. **Purvesh Khatri**. *Novel Method for Meta-analysis of Acute Rejection across Multiple Organ Data Sets Identifies a Core Immune Response Module for Repositioning Novel Therapeutics in Transplantation*. 2012 Summit on Translational Bioinformatics (TBI). San Francisco, CA, March 19-23, **2012**.
14. **Purvesh Khatri**. *A common immune response module for acute rejection across multiple organs can reposition novel therapeutics for organ transplantation*. 3<sup>rd</sup> International Conference on Transplantomics and Biomarkers in Organ Transplantation. La Jolla, CA, March 8-10, **2012**.
15. **Purvesh Khatri**, Shai Shen-Orr, Robert Tibshirani, Atul Butte, Minnie Sarwal. *Novel Cell-type Specific Deconvolution of Whole-Blood Gene Expression Profiles in Renal Acute Rejection*. American Transplant Congress, San Diego, USA, May 1-5, **2010**.
16. **Purvesh Khatri**, Richard Hayden Jones, Atul J Butte, Minnie M Sarwal. *Meta-analysis of Solid Organ Transplant Data Sets Identifies Differentially Expressed microRNAs common in Heart, Kidney and Liver Allografts*. American Transplant Congress, San Diego, USA, May 1-5, **2010**. (Selected for "Young Investigator Award")
17. **Purvesh Khatri**, Adi Laurentiu Tarca, Kashyap Amin, Arina Done, Calin Voichita, Constantin Georgescu, Roberto Romero, and Sorin Draghici. *A systems biology approach for steady-state analysis of signaling pathways*. 16th Annual International Conference on Intelligent Systems for Molecular Biology, Toronto, Canada, July 19-23, **2008**.
18. Sorin Draghici and **Purvesh Khatri**. *A systems biology approach for pathway level analysis*. Pacific Symposium on Biocomputing (PSB 2007). Wailea, Maui, January 3-7, **2007**.
19. Sorin Draghici, **Purvesh Khatri**, Constantin Georgescu, Adi Laurentiu Tarca. *A systems biology approach for pathway level analysis*. Pacific Symposium on Biocomputing (PSB 2007). Wailea, Maui, January 3-7, **2007**.
20. Sorin Draghici, Kashyap Amin, Arina Done, and **Purvesh Khatri**. *Beyond classical statistics - A systems biology approach for pathway level analysis*. 14th Annual International Conference on Intelligent Systems for Molecular Biology (ISMB), 2006. Fortaleza, Brazil, August 6-10, **2006**.
21. Sivakumar Sellamuthu, **Purvesh Khatri**, and Sorin Draghici. *Onto-Translate: Resolving name space issues in the existing biological annotation databases*. 10th Annual International Conference on Research in Computational Molecular Biology (RECOMB), Venice Lido, Italy. April 2-5, **2006**.
22. *Recent additions and improvements to the Onto-Tools*. Gene Ontology Consortium User Meeting. University of Bergen, Bergen, Norway, September 14-15, **2005**.
23. *Onto-Tools, A toolset for modern biologists: Onto-Express, Onto-Compare, Onto-Design, Onto-Translate and Onto-Miner*. Great Lakes Bioinformatics. Michigan State University, East Lansing, Michigan, Aug 19-20, **2003**.

## Invited Talks

1. Invited talk, 3<sup>rd</sup> international workshop on clinical tolerance, Stanford, CA. *Identification and validation of robust gene signatures for graft injury using heterogeneous public data*. September 8-9, **2017**.

2. Invited talk, 10<sup>th</sup> integrative biology symposium, Hanover, NH. *Adventures of a data parasite: accelerating translational medicine using public data*. May 23, **2017**
3. Invited talk, SystemX alliance workshop on Big Data, Diagnostic Devices and Bioelectric Interfaces in Medicine, Stanford, CA. *Leveraging heterogeneity in public data for precision medicine*. April 18, **2017**
4. Invited talk, Statistics and Genomics Seminar, University of California, Berkeley, CA. *Data Re-Use is Not Parasitism: Translational Medicine Using Public Data*. April 13, **2017**
5. Keynote, Grand Challenges India, New Delhi, India. *Igniting Young Minds: translational medicine using public data*. March 24, **2017**
6. Invited talk, CHI Molecular Tri-Conference, San Francisco, CA. *Accelerating diagnosis and therapy of infectious diseases using public heterogeneous data*. February 20-22, **2017**
7. Invited talk, Madagascar: a crucible for science, health and the environment. Stanford, CA. *Leveraging heterogeneity in public data for translational medicine*. February 8, **2017**
8. Invited talk, Pacific Symposium on Biocomputing, Big Island Hawaii, HI. *Adventures of a "data parasite": translational medicine using heterogeneous data*. January 3, **2017**
9. Invited talk, Collaborative Centers for Human Immunology, Bethesda, MD. *Translational medicine using heterogeneous public data*. November 30-December 2, **2016**
10. Invited talk, American Medical Informatics Association, Chicago, IL. *Re-use is not parasitism*. November 13, **2016**
11. Invited talk, SCOT trial meeting, American College of Rheumatology, Washington, DC. *Integrated multi-cohort analysis of SSc skin*. November 12, **2016**
12. Invited talk, Cornell University, Ithaca, NY. *Adventures of a "data parasite": accelerating translational medicine using heterogeneous data*. November 11, **2016**
13. Invited talk, Grand Challenges, London, UK. *Adventures of a "data parasite": accelerating translational medicine using heterogeneous data*. October 26, **2016**
14. Invited talk, Cepheid, Sunnyvale, CA. *Host-response diagnostics for infectious diseases using public data*. September 9, **2016**
15. Invited talk, Grand rounds, Stanford University, Stanford, CA. *Adventures of a "data parasite": accelerating translational medicine using heterogeneous data*. August 10, **2016**
16. Invited talk, EternaCon, Stanford University, Stanford, CA. *Robust 3-gene signature for diagnosis of tuberculosis using public data*. July 16, **2016**
17. Invited talk, University of Alabama, Birmingham, AL. *Integrated multi-scale analysis of public data for translational medicine*. July 14-15, **2016**
18. Invited talk, Yale Symposium on Influenza, Yale University, New Haven, CT. *Accelerating translational medicine using public data*. June 24, **2016**
19. Invited talk, Summer school for computational immunology, Yale University, New Haven, CT. *Multi-cohort analysis of gene expression data*. June 22, **2016**
20. Invited talk, Summer school for computational immunology, Yale University, New Haven, CT. *Pathway analysis: current approaches and limitations*. June 21, **2016**
21. Invited talk, Grand rounds, University of Texas, Houston, TX. *Accelerating translational medicine using public data*. June 16-17, **2016**
22. Invited talk, 17th Annual UC Systemwide Bioengineering Symposium at University of California, San Francisco, CA. *Translational medicine using publicly available heterogeneous data*. June 14, **2016**
23. Invited talk, Big data bioinformatics, GLCbio, Boston, MA. *Accelerating biomarker discovery using public data*. May 25-27, **2016**
24. Invited talk, MedImmune, Mountain View, CA. *Leveraging heterogeneity in public data for translational medicine*. May 23, **2016**
25. Invited talk, One Health Symposium, Stanford, CA. *Accelerating translational medicine using heterogeneous public data*. April 30, **2016**
26. Invited talk, Grand rounds, Division of Infectious Diseases, Stanford University, Stanford, CA. *Adventures of a "data parasite": novel diagnostics and therapies using public data*. March 31, **2016**



27. Invited talk, Biomarkers in infectious diseases, GLCbio, San Diego, CA. *Accelerating biomarker discovery using public data*. March 21-23, **2016**
28. Invited talk, Scleroderma Research Foundation, San Francisco, CA. *Integrated multi-cohort analysis of systemic sclerosis*. March **2016**
29. Invited talk, CHI Molecular Tri-Conference (session chair and talk for infectious diseases diagnosis), San Francisco, CA. *Novel diagnostic approaches in infectious diseases*. March 7-9, **2016**
30. Invited talk, Arthritis Foundation, Atlanta, GA. *Systems approach for computational immunology*. February 23-24, **2016**
31. Invited talk, Grand rounds, Northwestern University, Chicago, IL. *Accelerating translational medicine using heterogeneous public data*. February 10-12, **2016**
32. Invited talk, Grand rounds, Pulmonary and Critical Care Medicine, Stanford, CA. *Translational medicine using public data*. September 18, **2015**
33. Invited talk, Big Data in Biomedicine, Stanford, CA. *Understanding immunology using public data*. May 20-22, **2015**
34. Invited talk, Arthritis Foundation, Atlanta, GA. *Framework for integrated multi-cohort analysis of molecular data*. May 13-14, **2015**
35. Invited talk, NIH Perinatology Research Branch, Detroit, MI. *Onto-Tools: toolkit for higher level analysis of gene expression data*. May **2013**
36. Keynote, Childhood Leukemia International Consortium, University of California, Berkeley, CA. *Translational medicine using multi-scale analysis of public data: studies in cancer and drug repositioning*. October 3, **2012**
37. Invited talk, Functional Genomics Data Society (FGED), Cambridge, MA. *Meta-analysis of public domain data sets for translational medicine*. January 25-26, **2012**
38. Invited talk, Institute for Digital Biology, Mississippi State University, Starkville, MS. *Onto-Tools: a toolkit for modern biologists*. May 20-22, **2008**
39. Invited talk, US Army Medical Research and Materiel Command, Fort Detrick, MD. *Onto-Expression: tool for identifying significant processes in high throughput gene expression data*. July 18, **2003**
40. Invited talk, The Frederick Forum on Bioinformatics and Chemoinformatics, National Cancer Institute and US Army Medical Research and Materiel Command, Fort Detrick, MD. *Data analysis for microarrays*. June 24-25, **2003**

## Patent Applications and Disclosures

1. Biomarkers for use in prognosis of mortality in critically ill patients. US patent 10,344,332 and 10,648,033. (Licensed to Inflammatrix, Inc.)
2. Methods for diagnosis of tuberculosis. US 10,920,275. European patent 3362579. (Licensed to Cepheid)
3. Methods for diagnosis of sepsis. US patent 10,533,224, European patent 3268499. (Licensed to Inflammatrix, Inc.)
4. Protein and Gene Biomarkers for Rejection of Organ Transplants. US provisional patent no. 9,535,075. Canadian patent 2,794,255, European patent 2803735. (Licensed to Organ-i)
5. Methods for diagnosis of bacterial and viral infections. US provisional application no. 62/346,962 (Licensed to Inflammatrix, Inc.)
6. Biomarkers of ovarian cancer. US provisional patent application no. 14/914, 245. (Licensed to mProbe, Inc.)
7. Identification of new therapeutic uses for known therapeutic agents US provisional patent no. 14/361,668
8. Onto-Express: A Tool for Functional Profiling of Bioinformatics Data. January 2, 2002. US Patent Application No. 60/347,383.

## Funding

Note: Amounts represent total cost per year for Dr. Khatri's group in each proposal.

### ACTIVE

**R01 AI125197 (Utz, PI)** 08/01/2016 - 07/31/2021 1.50 calendar

\$94,526 (Annual Direct Cost)

NIH NIAID

*Giant Magneto Resistive (GMR) Sensors for Measuring Influenza Vaccine*

Dr. Khatri serves as a co-investigator on this proposal and will be responsible for analysis of data generated in each of the three aims for performing systems biology analysis of influenza vaccination.

Role: Co-I

**Bill & Melinda Gates Foundation (Davis, PI)** 10/01/2020 - 09/30/2021 0.24 calendar

\$412,302 (Annual Direct Cost)

*Global Health-Vaccine Accelerator Program Infrastructure*

The goal of this project is to build a technological and computational framework for accelerating vaccine development for infectious diseases.

Role: Co-I

**Bill & Melinda Gates Foundation (Khatri, Co-PI)** 10/01/20 - 09/30/2021 0.24 calendar

\$266,864 (Annual Direct Cost)

*Understanding Role of NK cells in tuberculosis*

The goal of this project is to identify the biological mechanisms in NK cells driving tuberculosis disease.

Role: Co-PI

**Bill & Melinda Gates Foundation (Khatri, PI)** 10/01/20 - 09/30/2021 0.24 calendar

\$69,955 (Annual Direct Cost)

*Developing protease-based diagnostics for pneumonia*

The goal of this project is to identify a set of proteases that can diagnose bacterial infection.

Role: PI

**Bill & Melinda Gates Foundation (Khatri, PI)** 10/01/20 - 09/30/2021 0.12 calendar

\$332,929 (Annual Direct Cost)

*RNA-seq analysis of BCG vaccine in non-human primates*

The major goals of this project is to identify correlates of protection following BCG vaccine

Role: PI

**Bill & Melinda Gates Foundation (Khatri, PI)** 10/01/20 - 09/30/2021

0.24 calendar

\$263,223 (Annual Direct Cost)

*Transcriptomic analysis of RhCMV vector vaccines in NHP SIV and TB Challenge Studies*

The goal of this GH-VAP project is to determine protective gene signatures induced by RhCMV/SIV and RhCMV/TB vaccination in rhesus macaque challenge studies. A key future question outside the scope of this project but dependent upon its success is whether validated gene signatures that track with protection in non-human primates are reproduced in the first-in-human study of the hCMV vectors.

Role: PI

**Bill & Melinda Gates Foundation (Jaganathan, PI)** 01/01/21 – 09/30/21  
0.36 calendar  
\$16,615 (Annual Direct Cost)

Mechanisms and longevity of innate immune hypo-responsivity to malaria.  
To determine whether malaria-driven innate immune dysfunction is associated with epigenetic reprogramming.  
Role: Co-PI

**NIH 3UL1TR003142-02S2 (O'Hara, PI)** 02/01/21 – 08/31/21 0.90  
calendar  
\$10,442 (Annual Direct Cost)

Administration of Spectrum Pilot Program-The Stanford Predictive and Diagnostics Accelerator (SPADA) to accelerating clinical and translational research in biomedical and health-related areas.  
Role: Temporary Interim Director-SPADA

**EMD Serono, Inc. 133605 (Utz, PI)** 03/15/2018 - 03/14/2022 0.18 calendar  
\$129,781 (Annual Direct Cost)

*EMD Serono Stanford SLE Collaboration*

The purpose of this collaboration is to perform multi-cohort analysis of transcriptome data from rheumatoid arthritis patients.  
Role: Co-I

**W81XWH-18-1-0253 (Cantanzaro, PI)** 09/30/2018 - 09/29/2021 2.40 calendar  
\$155,129 (Annual Direct Cost)

Department of Defense / UC San Diego

*A Rapid Blood Test to Differentiate Latent Tuberculosis from Active Disease*

The major goal of this project is to develop a finger-stick triage test using non-stimulated blood that meets or exceeds WHO Target Product Profiles for a rapid biomarker-based non-sputum-based triage test for detecting TB; to extend the resulting finger-stick test to include biomarkers of pre-clinical TB.  
Role: Site PI

**NIH U19 AI057229-17 (Davis, PI)** 04/01/2020 - 03/31/2024 1.20 calendar  
\$137,995 (Annual Direct Cost)

*Influenza responses and repertoire in vaccination, infection and tonsil organoids*

The major goal of this project is to understand the fundamental processes with which the human immune system responds to vaccination and combat influenza infection.  
Role: Co-I

**DoD Dengue Grant (Einav, PI)** 09/30/2019 - 09/29/2022 1.20 calendar  
\$127,585 (Annual Direct Cost)

Department of Defense

*Immune mechanisms of pathogenesis and viral clearance in dengue patients*

The major goal goals are to: i) define and validate a transcriptomic signature for the early prediction of severe dengue and; ii) characterize the kinetics and quality of host immune responses during the course of natural dengue infection and of treatment with a novel antiviral approach we have developed.  
Role: Co-I

**U01 (Brigham and Women's Hospital (Levy, PI)** 10/01/2019 - 06/30/2024  
 2.40 calendar  
 \$120,266 (Annual Direct Cost)

NHLBI/NIH

*Immunometabolic phenotypes in adult severe asthma and disease progression*

Major Goals: For this project, Dr. Khatri and his team will perform integrated, multi-site systems biology analysis of the molecular data generated by this proposal.

Role: Site PI

**1R01ES03225301 (Nadeau, PI)** 08/01/2020 - 05/31/2022 0.18 calendar

\$11,517 (Annual Direct Cost)

*Pregnancy due to Ambient Air Pollution Exposure*

Major Goals: The goal is to understand the effect of air pollution on pregnant women and outcome of pregnancy.

**1R01LM013498-01 (Mark Musen, PI)** 12/01/2020 - 11/30/2024 1.80 calendar  
 \$158,529 (Annual Direct Cost)

NIH

*The Metadata Powerwash — Integrated tools to make biomedical data FAIR*

Major Goals: Our goal is to create methods and tools that improve the quality of scientific metadata hosted in public repositories, and thus enhance the discoverability and re-use of public biomedical datasets. Making data more accessible through scientifically rigorous metadata will accelerate the ability to make transformative data-driven biomedical discoveries using public data archives.

Role: Co-I

**ACTIVE**

**1U19AI109662 (Glenn)** 04/01/2014 – 03/31/2020 2.4 calendar  
 NIH/NIAID Role: Co-I \$334,490/year

Project 5: Accelerating novel countermeasures against RNA viruses through repurposing. Advancing Broad Spectrum Host Targeting Antiviral Strategies to the Clinic

**R01 HL128734 (Spiekerkoetter, PI)** 05/01/2016 – 04/30/2021 0.6 calendar  
 NIH/NHLBI Role: Co-I \$334,490/year

Targeting Novel BMP2 modifiers in Pulmonary Hypertension with Repurposed Drugs

**R01AI125197 (Utz, PI)** 07/01/2016 – 06/30/2021 1.2 calendar  
 NIH/NIAID Role: Co-I \$148,406/year

Influenza Vaccine Response Prediction using GMR sensors

**U19 AI057229 (Davis)** 05/01/2014 – 04/30/2024 1.2 calendar  
 NIH/NIAID Role: Co-I \$129,727/year

Adaptive and innate immunity, memory and Repertoire in Vaccination and infection

**Bill & Melinda Gates Foundation** 10/01/2016 – 09/30/2021 1.2 calendar  
 Role: PI \$485,813/year

Global Health-Vaccine Accelerator Program Infrastructure

<b>Bill &amp; Melinda Gates Foundation</b>	10/01/2018 – 09/30/2021	1.2 calendar
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	Role: Co-PI	\$182,041/year
Understanding role of NK cells in Tuberculosis		
<b>Bill &amp; Melinda Gates Foundation</b>	05/01/2018 – 04/30/2020 Role: PI	1.2 calendar \$55,018/year
RNA-seq analysis of BCG vaccine in non-human primates.		
<b>EMD Serono, Inc</b>	03/15/2018 – 03/14/2020 Role: Co-PI	0.3 calendar \$70,739/year
Adaptive and innate immunity, memory and Repertoire in Vaccination and infection		
<b>W81XWH-18-1-0253 (Cantanzaro)</b> Department of Defense	09/30/2018 – 09/29/2021 Role: Co-PI	0.6 calendar \$256,494/year
A Rapid Blood Test to Differentiate Latent Tuberculosis from Active Disease		
<b>Dr. Ralph &amp; Marian Falk Medical Research Trust (Einav)</b>	12/31/2018 – 12/30/2020 Role: Co-PI	1.2 calendar \$179,835/year
Towards predicting and preventing the development of severe dengue		
<b>Department of Defense (Einav)</b>	09/30/2019 – 09/29/2022 Role: Co-I	1.2 calendar \$199,804/year
Immune mechanisms of pathogenesis and viral clearance in dengue patients		
<b><u>PENDING</u></b>		
Note: Amounts represent total cost for the proposal.		
<b>Immunometabolic phenotypes in adult severe asthma and disease progression (Levy)</b> NIH/NHLBI	04/01/2020 – 03/31/2025 Role: Site PI	1.2 calendar \$195,341/year
<b><u>COMPLETED</u></b>		
<b>(Khatri)</b> Vir Biotechnology, Inc.	06/14/2017 – 06/13/2018 Role: PI	2.4 calendar \$2,041,000/year
Strategic efforts in computational immunology using public data		
<b>U54I117925 (Musen)</b> NIH	09/01/2014 – 08/31/2018 Role: Co-I	1.8 calendar \$217,766/year
Center for Expanded Data Annotation and Retrieval		
<b>Bill &amp; Melinda Gates Foundation (Davis)</b>	09/01/2016 – 08/31/2019 Role: Co-I	0.6 calendar \$342,299/year
Analysis of the immune state of latent Mtb infection and its progression to active diseases		
<b>Gates Foundation (Khatri)</b> Gates Foundation	07/01/2015 – 06/30/2017 Role: PI	0.0 calendar \$150,000/year
Optimization and validation of a whole-blood transcriptional signature to distinguish bacterial infections from viral infections in resource-limited settings		

<b>Integrative Omics of Macrophage-Vascular Interaction in Pulmonary Hypertension (Rabinovitch)</b> NIH	04/01/2015 – 03/31/2019 Role: Co-I	1.2 calendar \$152,491/year
Integrative Omics of Macrophage-Vascular Interaction in Pulmonary Hypertension		
<b>U01AI089859 Infrastructure Opportunity Fund (Khatri)</b> NIH	01/01/2014 -06/30/2015	1.2 calendar
Development of HIPC data standards to support cross-center projects		
<b>Proposal to enhance Cell Ontology (Khatri)</b> NIAID/NIH	07/01/2015 – 06/30/2016	0 calendar
<b>AMP RA/SLE leadership center (Utz)</b> NIAMS/NIH	06/15/2015 – 05/31/2017 Role: Co-I	0.6 calendar
<b>Vaccination and Infection: Indicators of immunological health and responsiveness (Davis)</b>		
NIAID/NIH Role: Co-I	07/15/2015 – 06/30/2016	0.5 calendar
<b>Northrop Grumman (Khatri)</b> Northrup Grumman	04/01/2015 – 09/29/2015	0.01 calendar
<b>Protein Methyltransferases in pancreatic cancer (Sage)</b> Lustgarten Foundation	01/01/2015 – 12/31/2015	0.2 calendar
<b>Prospective Validation of a Three-Gene Set for Diagnosis of Tuberculosis and Prognosis of Treatment Response (Khatri/Andrews)</b> SPADA	01/01/2016 – 12/31/2016 Role: PI	0% effort
<b>Strategic effort in precision immunology – I-GPS (Altman)</b> Pfizer	11/17/2015 – 11/16/2016	0% effort