

Helder I Nakaya

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- > Assistant Professor

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ACADEMIC AND PROFESSIONAL APPOINTMENTS

Assistant Professor of Department of Clinical and Toxicological
Analyses at University of Sao Paulo, 2013 – Present

Assistant Professor of Department of Pathology at Emory
University School of Medicine, 2011 – Present

PREVIOUS ACADEMIC AND PROFESSIONAL APPOINTMENTS

2008-2011: Post-doctoral fellow at Emory University

2007-2008: Post-doctoral fellow at University of São Paulo

EDUCATION

1997-2001: B.Sc in Biology, University of São Paulo, Brazil

2001-2007: Ph.D. in Molecular Biology and Biochemistry. Instituto
de Química, Universidade de São Paulo, Brazil

HONORS AND AWARDS

1999: Honor student - University of São Paulo, 7th Meeting in
Student Pilot research

2004: Awarded “Best Poster Presentation” at 50th Congress of
Genetic of the Brazilian Society of Genetics

2008: Thesis selected for “Best Thesis of the Year National
Award”

2010: Australian Centre for Vaccine Development-Emory Vaccine
Center Training Fellowship

2011: International Society for Vaccines “Paper of the year”

EDITORSHIPS AND EDITORIAL BOARDS

2010-: Frontiers in Non-coding RNA

2012-: The Scientific World Journal (Genomics)

2013: Guest editor of special issue of BioMed Research
International journal

2013: BMC Genomics

2014: Frontiers in Molecular Biosciences

2014: Current Synthetic and Systems Biology

MANUSCRIPT REVIEWER

2008-: Gene

2008-: Genetics and Molecular Research

2011-: BMC Genomics

2011-: Proceedings of the National Academy of Sciences of the United States of America (PNAS)

2011-: Frontiers in Bioinformatics and Computational Biology

2011-: Journal of Virology

2012-: PLoS ONE

2012-: BMC Molecular Biology

2013-: Briefings in Bioinformatics

2013-: International Journal of Genomics

2014-: Immunology Letters

2014-: The Journal of Infectious Diseases

2014-: Frontiers in Immunology

2014-: DNA and Cell Biology

SOCIETY MEMBERSHIPS

2009-: International Society for Computational Biology

RESEARCH GRANTS

2013-2017: Jovem Pesquisador, FAPESP: 2012/19278-6.

2014: Transcriptomic Meta-Analysis of Positionally Conserved Long Noncoding RNAs, FAPESP-Cambridge: 2014/50308-4.

INVITATIONS TO NATIONAL OR INTERNATIONAL CONFERENCES

2010: Baylor University Medical Center, Seminar: "Systems Biology of Influenza Vaccines" – Speaker (USA)

2011: Yale University, Seminar: "Systems Biology of Seasonal Vaccination in Humans" – Speaker (USA)

2011: Stanford University, Seminar: "MicroRNA signatures of vaccination in humans" – Speaker (USA)

2011: XIII Reunião Científica Annual do Instituto Butantan, Seminar: "Systems vaccinology: learning to compute the behavior of vaccine induced immunity" – Speaker (Brazil)

2012: American Thoracic Society International Conference, Seminar: "Systems Vaccinology" – Speaker (USA)

- 2013: 20th Conference on Retrovirus and Opportunistic Infections, Seminar: “Systems vaccinology: its promise and challenge for HIV vaccine development” – Speaker (USA)
- 2013: International Workshop on Predictive Markers of Safety and Immunogenicity of Adjuvanted Vaccines, Seminar: “Systems Biology to Predict Immunogenicity and Safety of Adjuvants” – Speaker (USA)
- 2013: System Biology Approaches in Vaccinology, ADITEC – Speaker (Brussels)
- 2013: Keystone: Advancing Vaccines in the Genomics Era – Speaker (Brazil).
- 2013: Osong Symposium on Infectious Disease – Speaker (South Korea).
- 2014: I Simposio en Bioinformática Integrativa – Keynote Speaker (Chile)
- 2014: XXXIX Congress of the Brazilian Society of Immunology – Speaker (Brazil)
- 2014: Brazilian Association of Pharmaceutical Sciences – Speaker (Brazil)
- 2014: Interscience Conference on Antimicrobial Agents and Chemotherapy – Speaker (Washington DC, USA)
- 2014: British Society for Immunology Congress – Speaker (United Kingdom)
- 2014: International Conference on Genome Architecture and Cell Fate Regulation – Speaker (India)

REGISTERED PATENTS

- 2011: Title “METHODS OF DETERMINING VACCINATION EFFICACY, DEVICES, AND COMPOSITIONS RELATED THERETO”, number PCT/US2012/039542. Inventors: Bali Pulendran and Helder Nakaya. Applicant: Emory University.

PUBLISHED AND ACCEPTED RESEARCH ARTICLES IN REFEREED JOURNALS

1. Louro R, **Nakaya HI**, Paquola AC, Martins EA, da Silva AM, Verjovski- Almeida S, Reis EM. (2004). RASL11A, member of a novel small monomeric GTPase gene family,

- is down-regulated in prostate tumors. Biochemical and Biophysical Research Communications, 316 (3):618-27.
2. Reis EM, **Nakaya HI**, Louro R, et al. (2004). Antisense intronic non-coding RNA levels correlate to the degree of tumor differentiation in prostate cancer. Oncogene, 23:6684-92.
 3. Louro R, **Nakaya HI**, Amaral PP, Festa F, Sogayar MC, da Silva AM, Verjovski-Almeida S, Reis EM (2007) Androgen responsive intronic non- coding RNAs. BMC Biology, 30;5:4
 4. **Nakaya HI**, Amaral PP, Louro R, Lopes A, Fachel AA, Moreira YB, El Jundi TA, da Silva AM, Reis EM, Verjovski-Almeida S (2007) Genome mapping and expression analyses of human intronic noncoding RNAs reveal tissue-specific patterns and enrichment in genes related to regulation of transcription. Genome Biology, 8(3):R43.
 5. **Nakaya HI**, Beckedorff FC, Baldini ML, Fachel AA, Reis EM, Verjovski-Almeida S (2007) Splice Variants of TLE Family Genes and Up-Regulation of a TLE3 Isoform in Prostate Tumors. Biochemical and Biophysical Research Communications, 364(4):918-23.
 6. Zaini PA, Fogaca AC, Lupo FGN, **Nakaya HI**, Vêncio RZN, da Silva AM (2008) The iron stimulon of *Xylella fastidiosa* includes genes for type- IV pilus and colicin V-like bacteriocins. Journal of Bacteriology, 190(7):2368-78
 7. Louro R, El Jundi T, **Nakaya HI**, Reis EM, Verjovski-Almeida S (2008) Conserved tissue expression signatures of intronic noncoding RNAs transcribed from human and mouse loci. Genomics, 92(1):18-25.
 8. de Mello Varani A, Souza RC, **Nakaya HI**, de Lima WC, Paula de Almeida LG, Kitajima EW, Chen J, Civerolo E, Vasconcelos AT, Van Sluys MA (2008) Origins of the

- Xylella fastidiosa prophage-like regions and their impact in genome differentiation. PLoS ONE, 3(12):e4059.
9. Querec TD, Akondy RS, Lee EK, Cao W, **Nakaya HI**, et al. (2009) Systems biology approach predicts immunogenicity of the yellow fever vaccine in humans. Nature Immunology, Jan;10(1):116-25
 10. Tang H, Cao W, Kasturi SP, Ravindran R, **Nakaya HI**, Kundu K, Murthy N, Kepler TB, Malissen B, Pulendran B (2010) The T helper type 2 response to cysteine proteases requires dendritic cell-basophil cooperation via ROS-mediated signalling. Nature Immunology, Jul;11(7):608-17
 11. Manicassamy S, Reizis B, Ravindran R, **Nakaya H**, Salazar-Gonzalez RM, Wang YC, Pulendran B. (2010) Activation of beta-catenin in dendritic cells regulates immunity versus tolerance in the intestine. Science, Aug 13;329 (5993):849–53
 12. Kasturi SP, Skountzou I, Albrecht RA, Koutsonanos D, Hua T, **Nakaya HI**, Ravindran R, Stewart S, Alam M, Kwissa M, Villinger F, Murthy N, Steel J, Jacob J, Hogan RJ, García-Sastre A, Compans R, Pulendran B. (2011) Programming the magnitude and persistence of antibody responses with innate immunity. Nature, Feb 24;470(7335):543-7.
 13. Duraiswamy J, Ibegbu CC, Masopust D, Miller JD, Araki K, Doho GH, Tata P, Gupta S, Zilliox MJ, **Nakaya HI**, Pulendran B, Haining WN, Freeman GJ, Ahmed R. (2011) Phenotype, function, and gene expression profiles of programmed death-1hi CD8 T cells in healthy human adults. Journal of Immunology, Apr 1; 186(7):4200-12
 14. **Nakaya HI**, Wrammert J, Lee EK, Racioppi L, et al. (2011) Systems biology analysis of vaccination for seasonal influenza in humans. Nature Immunology, Jul 10;12(8):786-95

15. Kwissa M, **Nakaya HI**, Oluoch H, and Pulendran B. (2012) Distinct TLR adjuvants differentially stimulate systemic and local innate immune responses in nonhuman primates. Blood, Mar 1;119(9):2044-55.
16. Jones CL, Sampson TR, **Nakaya HI**, Pulendran B, Weiss DS. (2012) Repression of Bacterial Lipoprotein Production by *F. novicida* Facilitates Evasion of Innate Immune Recognition. Cell Microbiology, May 25; doi: 10.1111/j.1462-5822.2012.01816.x
17. **Nakaya HI**, Gardner J, Poo YS, Major L, Pulendran B, Suhrbier A. (2012) Gene Profiling of Chikungunya Virus Arthritis Reveals Significant Overlap with Rheumatoid Arthritis. Arthritis & Rheumatism, Nov; 64(11):3553-63.
18. Norris BA, Uebelhoer LS, **Nakaya HI**, Price AA, Grakoui A, Pulendran B. (2013) Chronic but Not Acute Virus Infection Induces Sustained Expansion of Myeloid Suppressor Cell Numbers that Inhibit Viral-Specific T Cell Immunity. Immunity, Feb 21; 38(2):309-321.
19. Beckedorff FC, Ayupe AC, Crocci-Souza R, Amaral MS, **Nakaya HI**, Soltys DT, Menck CFM, Reis EM and Verjovski-Almeida S. (2013) The Intronic Long Noncoding RNA ANRASSF1 Recruits PRC2 to the RASSF1A Promoter, Reducing the Expression of RASSF1A and Increasing Cell Proliferation. PLoS Genetics, Aug;9(8):e1003705.
20. Tan Y, Tamayo P, **Nakaya HI**, Pulendran B, Mesirov JP, Haining WN. (2014) Gene signatures related to B-cell proliferation predict influenza vaccine-induced antibody response. European Journal of Immunology. 44, 1, 285–295.
21. Li S, Roupael N, Duraisingham S, Romero-Steiner S, Presnell S, Davis C, Schmidt DS, Johnson SE, Milton A, Rajam G, Kasturi S, Carlone GM, Quinn C, Chaussabel D,

- Palucka AK, Mulligan MJ, Ahmed R, Stephens DS, **Nakaya HI**, Pulendran B. (2013) Molecular signatures of antibody responses derived from a systems biology study of five human vaccines. Nature Immunology 15, 195–204.
22. Ravindran R, Khan N, **Nakaya HI**, Li S, Loebbermann J, Maddur MS, Park Y, Jones DP, Chappert P, Davoust J, Weiss DS, Virgin HW, Ron D, Pulendran B. (2014) Vaccine Activation of the Nutrient Sensor GCN2 in Dendritic Cells Enhances Antigen Presentation. Science 17: Vol. 343 no. 6168 pp. 313-317.
23. Tamim S, Vo DT, Uren PJ, Qiao M, Bindewald E, Kasprzak WK, Shapiro BA, **Nakaya HI**, Burns SC, Araujo PR, Nakano I, Radek AJ, Kuersten S, Smith AD, Penalva LOF. (2014) Genomic Analyses Reveal Broad Impact of miR-137 on Genes Associated with Malignant Transformation and Neuronal Differentiation in Glioblastoma Cells. PLoS ONE 22: DOI: 10.1371/journal.pone.0085591
24. Poo YS, **Nakaya H**, Gardner J, Larcher T, Schroder WA, Le TT, Major LD, Suhrbier A. (2014) CCR2 Deficiency Promotes Exacerbated Chronic Erosive Neutrophil-Dominated Chikungunya Virus Arthritis. Journal of Virology 15;88(12):6862-72.
25. Kwissa M, **Nakaya HI**, et al. (2014) Dengue Virus Infection Induces Expansion of a CD14(+)/CD16(+) Monocyte Population that Stimulates Plasmablast Differentiation. Cell Host Microbe; 16(1):115-27
26. Oh JZ, Ravindran R, Chassaing B, Carvalho FA, Maddur MS, Bower M, Hakimpour P, Gill KP, Nakaya HI, Yarovinsky F, Sartor RB, Gewirtz AT, and Pulendran B (2014) TLR5-Mediated Sensing of Gut Microbiota Is Necessary for Rapid Induction and Persistence of Humoral Immune Responses to Seasonal Influenza Vaccination. Immunity; *in press*

REVIEW ARTICLES

1. Reis EM, Louro R, **Nakaya HI**, Verjovski-Almeida S (2005). AS AntiSense gets Intronic. OMICS, 9(1):2-12.
2. Pulendran B, Li S and **Nakaya HI** (2010) Systems Vaccinology. Immunity, Oct 29;33(4):516-29
3. **Nakaya HI**, Li S, Pulendran B. (2011) Systems Vaccinology: Learning to compute the behavior of vaccine induced immunity. Wiley Interdiscip Rev Syst Biol Med, Oct 19: DOI 10.1002/wsbm. 163
4. **Nakaya HI** and Pulendran B. (2012) Systems vaccinology: its promise and challenge for HIV vaccine development. Current Opinion in HIV & AIDS, Jan; 7(1):24-31.
5. de Mello Varani A, **Nakaya HI**, Monteiro-Vitorello CB, Van Sluys MA. (2013) The Role of Prophage in Plant Pathogenic Bacteria. Annual Review of Phytopathology, Vol. 51: 429-451.
6. Li S, **Nakaya HI**, Kazmin DA, Oh JZ, Pulendran B. (2013) Systems biological approaches to measure and understand vaccine immunity in humans. Semin Immunol, S1044-5323(13)00032-8.
7. Pulendran B, Oh J, **Nakaya HI**, Ravindran R, Kamin D. (2013) Immunity to viruses: learning from successful human vaccines. Immunological Reviews, 255, (1) 243–255.

BOOK CHAPTERS

1. **Nakaya HI**, Reis EM, Verjovski-Almeida S (2007) Concepts on microarray design for genome and transcriptome analyses. Chapter of book "Nucleic acid hybridization: modern applications", Editors: Anton A. Buzdin e Sergey A. Lukyanov, Publisher: Springer.
2. Duraisingham S, Roupael N, Cavanagh MM, **Nakaya HI**, Goronzy JJ and Pulendran B (2012) Systems Biology of Vaccination in the Elderly. Chapter of book "Current Topics in Microbiology and Immunology", Editors: Michael G. Katze, Publisher: Springer.
3. **Nakaya HI** (2013) Applying Systems Biology to Understand the Immune Response to Infection and Vaccination. Chapter of book "Computational Systems Biology, 2nd Ed", Editors: Elis & Kriete, Publisher: Elsevier, *in press*.