

## Alejandro B. Balazs, Ph.D.

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### EDUCATION

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|------|--|--|
| 2006 | Harvard University, Cambridge, MA.         | Ph.D. Genetics<br>Advisor: Richard Mulligan                        |
| 1999 | UCLA, Los Angeles, CA.<br><i>Cum Laude</i> | B.S. Microbiology & Molecular Genetics<br>Advisor: Sherie Morrison |

### RESEARCH POSITIONS

- |                |   |
|----------------|---|
| 2013 – Present | Assistant Professor of Medicine: Harvard Medical School   |
| 2013 – Present | Assistant in Immunology: Massachusetts General Hospital   |
| 2007 – 2013    | <u>Postdoctoral Fellow: California Institute of Technology</u><br>Advisor: David Baltimore  |
| 1999 – 2006    | <u>Graduate Student: Harvard University</u><br>Thesis Advisor: Richard Mulligan<br>Ph.D. Thesis: <i>Purification and Characterization of Hematopoietic Stem Cells by Microarray Analysis</i><br>Thesis Committee: Leonard Zon, Amy Wagers, Ihor Lemischka, Darrell Kotton |
| 1997 – 1999    | <u>Undergraduate Research: UCLA</u><br>Thesis Advisor: Sherie Morrison<br>Honors Thesis: <i>The Production and Characterization of Antibody Fusion Proteins for use as Anti-HIV Immunotherapeutics</i>  |
| 1996 – 1997    | <u>Summer Research: Lawrence Livermore National Laboratory</u><br>Advisor: Mehdi Balooch  |

### AWARDS, FELLOWSHIPS, AND GRANTS

- |             |   |
|-------------|---|
| 2016        | MGH Department of Medicine Transformative Scholars Program Award      |
| 2016        | Gilead Sciences Research Scholars Program in HIV Award                |
| 2015        | DP2 NIDA Avenir New Innovator Award                                   |
| 2015        | Charles H. Hood – Child Health Research Award                         |
| 2015        | William F. Milton Fund Award  |
| 2014        | HIV Research for Prevention 2014 Conference Scholarship Travel Award  |
| 2012        | K22 NIAID Research Scholar Development Award                          |
| 2011        | AIDS Vaccine 2011 Conference Scholarship Travel Award                 |
| 2010 – 2012 | The Foundation for AIDS Research (amfAR) Postdoctoral Fellowship      |
| 2000        | National Science Foundation Graduate Fellowship (Honorable Mention)   |
| 1999        | College Honors, College of Letters and Science – UCLA                 |
| 1999        | Departmental Honors, Department of Micro. & Molecular Genetics – UCLA |
| 1999        | Vice Provost Recognition Award, UCLA                                  |
| 1999        | Elma Gonzalez Dean's Prize for Undergraduate Research, UCLA           |

1998 – 1999 MARC Scholar, UCLA  
 1995 University of California at Berkeley, Chancellor Scholarship (declined)

### **TEACHING EXPERIENCE**

2022 Harvard Medical School, AISC612.0: Microbiology and Infectious Diseases  
 2020 Harvard Medical School, Division of Medical Sciences, Virology 202: Proposal Writing  
 2020 Harvard Medical School, Division of Medical Sciences. Lecture: Immunology 203: “Broadly Neutralizing Antibodies and Engineering Humoral Immunity” (Graduate)  
 2019 Harvard Medical School, Division of Medical Sciences, Virology 202: Proposal Writing  
 2018 Harvard Medical School, AISC612.0: Microbiology and Infectious Diseases  
 2017 Harvard Medical School, Division of Medical Sciences, Biological and Biomedical Sciences 330: Critical Thinking and Research Proposal Writing  
 2016 Harvard Medical School, Division of Medical Sciences, Biological and Biomedical Sciences 330: Critical Thinking and Research Proposal Writing  
 2015 Harvard Medical School, Division of Medical Sciences, Biological and Biomedical Sciences 330: Critical Thinking and Research Proposal Writing  
 2014 Harvard Medical School, Division of Medical Sciences, Biological and Biomedical Sciences 230: Analysis of the Biological Literature  
 2010 & 2012 California Institute of Technology, Department of Biology. Lecture: Bio115 (Virology) – “Introduction to Gene Therapy” (Undergraduate)  
 2008 – 2010 Supervisor for undergraduate students: California Institute of Technology  
 2005 Supervisor for undergraduate student: Harvard University  
 2000 Mentoring for Science: Harvard Medical School  
 Community outreach program to immerse inner-city youth in science

### **PRESENTATIONS (selected)**

2022 Invited Speaker: International Symposium on COVID-19 (New Delhi, India)  
 2021 Invited Speaker: Vaccine Research Center Seminar Series (Bethesda, MD)  
 2021 Keynote Speaker: University of Texas Department of Immunology Retreat (Houston, TX)  
 2019 Invited Speaker: International Meeting of HIV Infection of the Nervous System (Rome, Italy)  
 2019 Invited Speaker: Northwestern University Center for AIDS Research Seminar (Chicago, IL)  
 2019 Invited Speaker: NIAID Animal Models Workshop (Bethesda, MD)  
 2019 Invited Speaker: UW/Fred Hutch Center for AIDS Research Seminar (Seattle, WA)  
 2019 Invited Speaker: American Society of Gene & Cell Therapy 2019 (Washington, DC)  
 2019 Invited Speaker: HIV Reservoirs and Evolution (St. Lucia, South Africa)  
 2018 Platform Presentation: NIAID Workshop (Bethesda, MD)  
 2018 Invited Speaker: NIH Vaccine Research Center Seminar Series (Bethesda, MD)  
 2018 Invited Speaker: Keystone Emerging Technologies in Vaccine Development (Banff, Canada)  
 2017 Invited Speaker: Africa Health Research Institute (Durban, South Africa)  
 2017 Invited Speaker: Heinrich Pette Institute (Hamburg, Germany)  
 2017 Platform Presentation: 2017 HIV Vaccines Keystone (Steamboat Springs, CO)  
 2017 Invited Speaker: Broad Institute Infectious Disease and Microbiome Program (Cambridge, MA)

### **PUBLICATIONS (in reverse chronological order)**

1. Brady JM, Phelps M, MacDonald SW, Lam EC, Nitido A, Parsons D, Boutros CL, Deal CE, Garcia-Beltran WF, Tanno S, Natarajan H, Ackerman ME, Vrbancic VD, **Balazs AB**. Antibody-mediated prevention of vaginal HIV transmission is dictated by IgG subclass in humanized mice. *Sci Trans Med*. 2022 May 31. In Press

2. Canaday DH, Oyebanji OA, White E, Keresztesy D, Payne M, Wilk D, Carias L, Aung H, St Denis K, Sheehan ML, Berry SD, Cameron CM, Cameron MJ, Wilson BM, **Balazs AB**, King CL, Gravenstein S. COVID-19 vaccine booster dose needed to achieve Omicron-specific neutralisation in nursing home residents. *EBioMedicine*. 2022 May 20;80:104066. doi: 10.1016/j.ebiom.2022.104066. Online ahead of print. PMID: 35605428
3. Burns MD, Boribong BP, Bartsch YC, Loïselle M, St Denis KJ, Sheehan ML, Chen JW, Davis JP, Lima R, Edlow AG, Fasano A, **Balazs AB**, Alter G, Yonker LM. Durability and Cross-Reactivity of SARS-CoV-2 mRNA Vaccine in Adolescent Children. *Vaccines*. 2022 Mar 23;10(4):492. doi: 10.3390/vaccines10040492.
4. Kenney DJ, O'Connell AK, Turcinovic J, Montanaro P, Hekman RM, Tamura T, Berneshawi AR, Cafiero TR, Al Abdullatif S, Blum B, Goldstein SI, Heller BL, Gertje HP, Bullitt E, Trachtenberg AJ, Chavez E, Nono ET, Morrison C, Tseng AE, Sheikh A, Kurnick S, Grosz K, Bosmann M, Ericsson M, Huber BR, Saeed M, **Balazs AB**, Francis KP, Klose A, Paragas N, Campbell JD, Connor JH, Emili A, Crossland NA, Ploss A, Douam F. Humanized mice reveal a macrophage-enriched gene signature defining human lung tissue protection during SARS-CoV-2 infection. *Cell Rep*. 2022 Apr 4;110714. doi: 10.1016/j.celrep.2022.110714. Online ahead of print. PMID: 35421379
5. Casazza JP, Cale EM, Narpala S, Yamshchikov GV, Coates EE, Hendel CS, Novik L, Holman LA, Widge AT, Apte P, Gordon I, Gaudinski MR, Conan-Cibotti M, Lin BC, Nason MC, Trofymenko O, Telscher S, Plummer SH, Wycuff D, Adams WC, Pandey JP, McDermott A, Roederer M, Sukienik AN, O'Dell S, Gall JG, Flach B, Terry TL, Choe M, Shi W, Chen X, Kaltovich F, Saunders KO, Stein JA, Doria-Rose NA, Schwartz RM, **Balazs AB**, Baltimore D, Nabel GJ, Koup RA, Graham BS, Ledgerwood JE, Mascola JR; VRC 603 Study Team. Safety and tolerability of AAV8 delivery of a broadly neutralizing antibody in adults living with HIV: a phase 1, dose-escalation trial. *Nat Med*. 2022 Apr 11. doi: 10.1038/s41591-022-01762-x. Online ahead of print. PMID: 35411076
6. Barmettler S, DiGiacomo DV, Yang NJ, Lam T, Naranbhai V, Dighe AS, Burke KE, Blumenthal KG, Ling M, Hesterberg PE, Saff RR, MacLean J, Ofoman O, Berrios C, St Denis KJ, Lam EC, Gregory D, Iafrate AJ, Poznansky M, Lee H, **Balazs A**, Pillai S, Farmer JR. Response to SARS-CoV-2 Initial Series and Additional Dose Vaccine in Patients with Predominant Antibody Deficiency. *J Allergy Clin Immunol Pract*. 2022 Apr 2;. doi: 10.1016/j.jaip.2022.03.017. [Epub ahead of print] PubMed PMID: 35381395; PubMed Central PMCID: PMC8976568.
7. Hauser BM, Sangesland M, St Denis KJ, Lam EC, Case JB, Windsor IW, Feldman J, Caradonna TM, Kannegieter T, Diamond MS, **Balazs AB**, Lingwood D, Schmidt AG. Rationally designed immunogens enable immune focusing following SARS-CoV-2 spike imprinting. *Cell Rep*. 2022 Mar 22;38(12):110561. doi: 10.1016/j.celrep.2022.110561. Epub 2022 Mar 7. PMID: 35303475 PMCID: PMC8898741
8. Calvet-Mirabent M, Claiborne DT, Deruaz M, Tanno S, Serra C, Delgado-Arévalo C, Sánchez-Cerrillo I, de Los Santos I, Sanz J, García-Fraile L, Sánchez-Madrid F, Alfranca A, Muñoz-Fernández MÁ, Allen TM, Buzón MJ, **Balazs A**, Vrbanac V, Martín-Gayo E. Poly I:C and STING agonist-primed DC increase lymphoid tissue polyfunctional HIV-1-specific CD8<sup>+</sup> T cells and limit CD4<sup>+</sup> T-cell loss in BLT mice. *Eur J Immunol*. 2022 Mar;52(3):447-461. doi: 10.1002/eji.202149502. Epub 2022 Jan 8. PubMed PMID: 34935145.
9. Vanuytsel K, Villacorta-Martin C, Lindstrom-Vautrin J, Wang Z, Garcia-Beltran WF, Vrbanac V, Parsons D, Lam EC, Matte TM, Dowrey TW, Kumar SS, Li M, Wang F, Yeung AK, Mostoslavsky G, Dries R, Campbell JD, Belkina AC, **Balazs AB**, Murphy GJ. Multi-modal profiling of human fetal liver hematopoietic stem cells reveals the molecular signature of engraftment. *Nat Commun*. 2022 Mar 1;13(1):1103. doi: 10.1038/s41467-022-28616-x. PMID: 35232959 PMCID: PMC8888592

10. Naranbhai V, Nathan A, Kaseke C, Berrios C, Khatri A, Choi S, Getz MA, Tano-Menka R, Ofoman O, Gayton A, Senjobe F, Zhao Z, St Denis KJ, Lam EC, Carrington M, Garcia-Beltran WF, **Balazs AB**, Walker BD, lafrate AJ, Gaiha GD. T cell reactivity to the SARS-CoV-2 Omicron variant is preserved in most but not all individuals. *Cell*. 2022 Feb 3;S0092-8674(22)00140-4. doi: 10.1016/j.cell.2022.01.029. Online ahead of print. PMID: 35202566 PMCID: PMC8810349
11. Canaday DH, Oyeibanji OA, Keresztesy D, Payne M, Wilk D, Carias L, Aung H, St Denis K, Lam EC, Rowley CF, Berry SD, Cameron CM, Cameron MJ, Wilson BM, **Balazs AB**, King CL, Gravenstein S. Significant Reduction in Vaccine-Induced Antibody Levels and Neutralization Activity Among Healthcare Workers and Nursing Home Residents 6 Months Following Coronavirus Disease 2019 BNT162b2 mRNA Vaccination. *Clin Infect Dis*. 2021 Nov 19:ciab963. doi: 10.1093/cid/ciab963. Online ahead of print. PMID: 35174389
12. Garcia-Beltran WF, St Denis KJ, Hoelzemer A, Lam EC, Nitido AD, Sheehan ML, Berrios C, Ofoman O, Chang CC, Hauser BM, Feldman J, Roederer AL, Gregory DJ, Poznansky MC, Schmidt AG, lafrate AJ, Naranbhai V, **Balazs AB**. mRNA-based COVID-19 vaccine boosters induce neutralizing immunity against SARS-CoV-2 Omicron variant. *Cell*. 2022 Feb 3;185(3):457-466.e4. doi: 10.1016/j.cell.2021.12.033. Epub 2022 Jan 6. PMID: 34995482
13. Naranbhai V, Denis KJ, Lam EC, Onosereme O, Garcia-Beltran WF, Berrios C, Bhan AK, Gainor JF, **Balazs AB**, lafrate AJ. Neutralization breadth of SARS-CoV-2 viral variants following primary series and booster SARS-CoV-2 vaccines in patients with cancer. *Cancer Cell* 2021 Dec 5; S1535-6108(21)00614-0. doi: <https://doi.org/10.1016/j.ccell.2021.12.002> PMID: 34990570
14. Naranbhai V, Garcia-Beltran WF, Chang CC, Mairena CB, Thierauf JC, Kirkpatrick G, Onozato ML, Cheng J, St Denis KJ, Lam EC, Kaseke C, Tano-Menka R, Yang D, Pavlovic M, Yang W, Kui A, Miller TE, Astudillo MG, Cahill JE, Dighe AS, Gregory DJ, Poznansky MC, Gaiha GD, **Balazs AB**, lafrate AJ. Comparative immunogenicity and effectiveness of mRNA-1273, BNT162b2 and Ad26.COV2.S COVID-19 vaccines. *J Infect Dis*. 2021 Dec 9;jiab593. doi: 10.1093/infdis/jiab593. Online ahead of print. PMID: 34888672
15. Naranbhai V, Denis KJ, Lam EC, Onosereme O, Garcia-Beltran WF, Berrios C, Bhan AK, Gainor JF, **Balazs AB**, lafrate AJ. Neutralization breadth of SARS-CoV-2 viral variants following primary series and booster SARS-CoV-2 vaccines in patients with cancer. *Cancer Cell* 2021 Dec 5; S1535-6108(21)00614-0. doi: <https://doi.org/10.1016/j.ccell.2021.12.002>. Online ahead of print.
16. Bowes CL, Naranbhai V, St Denis KJ, Lam EC, Bertaux B, Keane FK, Khandekar MJ, **Balazs AB**, lafrate JA, Gainor JF, Willers H. Heterogeneous immunogenicity of SARS-CoV-2 vaccines in cancer patients receiving radiotherapy. *Radiother Oncol*. 2021 Nov 25;S0167-8140(21)09005-8. doi: 10.1016/j.radonc.2021.11.012. Online ahead of print.
17. Naranbhai V, Pernat CA, Gavralidis A, St Denis KJ, Lam EC, Spring LM, Isakoff SJ, Farmer JR, Zubiri L, Hobbs GS, How J, Brunner AM, Fathi AT, Peterson JL, Sakhi M, Hambelton G, Denault EN, Mortensen LJ, Perriello LA, Bruno MN, Bertaux BY, Lawless AR, Jackson MA, Niehoff E, Barabell C, Nambu CN, Nakajima E, Reinicke T, Bowes C, Berrios-Mairena CJ, Ofoman O, Kirkpatrick GE, Thierauf JC, Reynolds K, Willers H, Beltran WG, Dighe AS, Saff R, Blumenthal K, Sullivan RJ, Chen YB, Kim A, Bardia A, **Balazs AB**, lafrate AJ, Gainor JF. Immunogenicity and Reactogenicity of SARS-CoV-2 Vaccines in Patients With Cancer: The CANVAX Cohort Study. *J Clin Oncol*. 2021 Nov 9;JCO2101891. doi: 10.1200/JCO.21.01891. Online ahead of print. PMID: 34752147
18. Oyeibanji OA, Wilson B, Keresztesy D, Carias L, Wilk D, Payne M, Aung H, Denis KS, Lam EC, Rowley CF, Berry SD, Cameron CM, Cameron MJ, Schmader KE, **Balazs AB**, King CL, Canaday DH, Gravenstein S. Does a lack of vaccine side effects correlate with reduced BNT162b2 mRNA

- vaccine response among healthcare workers and nursing home residents? *Aging Clin Exp Res*. 2021 Oct 15;1-10. doi: 10.1007/s40520-021-01987-9. Online ahead of print. PMID: 34652783
19. Feldman J, Bals J, Altomare CG, St Denis K, Lam EC, Hauser BM, Ronsard L, Sangesland M, Bracamonte Moreno T, Okonkwo V, Hartojo N, **Balazs AB**, Bajic G, Lingwood D, Schmidt AG. Naive human B cells engage the receptor binding domain of SARS-CoV-2, variants of concern, and related sarbecoviruses. *Sci Immunol*. 2021 Oct 14:eabl5842. doi: 10.1126/sciimmunol.abl5842. Online ahead of print. PMID: 34648356
  20. Phelps M, **Balazs AB**. Contribution to HIV Prevention and Treatment by Antibody-Mediated Effector Function and Advances in Broadly Neutralizing Antibody Delivery by Vectored Immunoprophylaxis. *Front Immunol*. 2021 Sep 15;12:734304. doi: 10.3389/fimmu.2021.734304. eCollection 2021.
  21. Garcia-Beltran WF, Claiborne DT, Maldini CR, Phelps M, Vrbanac V, Karpel ME, Krupp KL, Power KA, Boutwell CL, **Balazs AB**, Tager AM, Altfeld M, Allen TM. Innate Immune Reconstitution in Humanized Bone Marrow-Liver-Thymus (HuBLT) Mice Governs Adaptive Cellular Immune Function and Responses to HIV-1 Infection. *Front Immunol*. 2021;12:667393. doi: 10.3389/fimmu.2021.667393. eCollection 2021. PubMed PMID: 34122425
  22. Canaday DH, Carias L, Oyebanji OA, Keresztesy D, Wilk D, Payne M, Aung H, St Denis K, Lam EC, Rowley CF, Berry SD, Cameron CM, Cameron MJ, Wilson B, **Balazs AB**, Gravenstein S, King CL. Reduced BNT162b2 mRNA vaccine response in SARS-CoV-2-naive nursing home residents. *Clin Infect Dis*. 2021 May 16; . doi: 10.1093/cid/ciab447. PubMed PMID: 33993265
  23. Cele S, Gazy I, Jackson L, Hwa SH, Tegally H, Lustig G, Giandhari J, Pillay S, Wilkinson E, Naidoo Y, Karim F, Ganga Y, Khan K, Bernstein M, **Balazs AB**, Gosnell BI, Hanekom W, Moosa MS; Network for Genomic Surveillance in South Africa; COMMIT-KZN Team, Lessells RJ, de Oliveira T, Sigal A. Escape of SARS-CoV-2 501Y.V2 from neutralization by convalescent plasma. (2021) *Nature*. 2021 Mar 29. doi: 10.1038/s41586-021-03471-w. PMID: 33780970
  24. Garcia-Beltran WF, Lam EC, St Denis K, Nitido AD, Garcia ZH, Hauser BM, Feldman J, Pavlovic MN, Gregory DJ, Poznansky MC, Sigal A, Schmidt AG, Iafrate AJ, Naranbhai V, **Balazs AB**. Multiple SARS-CoV-2 variants escape neutralization by vaccine-induced humoral immunity. (2021) *Cell*. 2021 Mar 12;184(9):2372-2383.e9. doi: 10.1016/j.cell.2021.03.013. PMID: 33743213
  25. Schiff AE, Linder AH, Luhembo SN, Banning S, Deymier MJ, Diefenbach TJ, Dickey AK, Tsibris AM, **Balazs AB**, Cho JL, Medoff BD, Walzl G, Wilkinson RJ, Burgers WA, Corleis B, Kwon DS. T cell-tropic HIV efficiently infects alveolar macrophages through contact with infected CD4+ T cells. (2021) *Sci Rep*. 2021 Feb 16;11(1):3890. doi: 10.1038/s41598-021-82066-x. PMID: 33594125
  26. Garcia-Beltran WF, Lam EC, Astudillo MG, Yang D, Miller TE, Feldman J, Hauser BM, Caradonna TM, Clayton KL, Nitido AD, Murali MR, Alter G, Charles RC, Dighe A, Branda JA, Lennerz JK, Lingwood D, Schmidt AG, Iafrate AJ, **Balazs AB**. COVID-19-neutralizing antibodies predict disease severity and survival. (2021) *Cell*. 2021 Jan 21;184(2):476-488.e11. doi: 10.1016/j.cell.2020.12.015. Epub 2020 Dec 15. PMID: 33412089
  27. Yousif AS, Ronsard L, Shah P, Omatsu T, Sangesland M, Bracamonte Moreno T, Lam EC, Vrbanac VD, **Balazs AB**, Reinecker HC, Lingwood D. The persistence of interleukin-6 is regulated by a blood buffer system derived from dendritic cells. (2021) *Immunity*. 2021 Feb 9;54(2):235-246.e5. doi: 10.1016/j.immuni.2020.12.001. Epub 2020 Dec 22. PMID: 33357409
  28. Kisalu NK, Pereira LD, Ernste K, Flores-Garcia Y, Idris AH, Asokan M, Dillon M, MacDonald S, Shi W, Chen X, Pegu A, Schön A, Zavala F, **Balazs AB**, Francica JR, Seder RA. Enhancing durability of

- CIS43 monoclonal antibody by Fc mutation or AAV delivery for malaria prevention. (2021) *JCI Insight*. 2021 Feb 8;6(3):e143958. doi: 10.1172/jci.insight.143958. PMID: 33332286
29. Chen Y, Zuiani A, Fischinger S, Mullur J, Atyeo C, Travers M, Lelis FJN, Pullen KM, Martin H, Tong P, Gautam A, Habibi S, Bensko J, Gakpo D, Feldman J, Hauser BM, Caradonna TM, Cai Y, Burke JS, Lin J, Lederer JA, Lam EC, Lavine CL, Seaman MS, Chen B, Schmidt AG, **Balazs AB**, Lauffenburger DA, Alter G, Wesemann DR. Quick COVID-19 Healers Sustain Anti-SARS-CoV-2 Antibody Production. (2020) *Cell* Dec 10;183(6):1496-1507.e16 doi: 10.1016/j.cell.2020.10.051. Epub 2020 Nov 3. PMID: 33171099
  30. Roy V, Fischinger S, Atyeo C, Slein M, Loos C, **Balazs A**, Luedemann C, Astudillo MG, Yang D, Wesemann DR, Charles R, Lafrate AJ, Feldman J, Hauser B, Caradonna T, Miller TE, Murali MR, Baden L, Nilles E, Ryan E, Lauffenburger D, Beltran WG, Alter G. SARS-CoV-2-specific ELISA development. (2020) *J Immunol Methods* Sep-Oct 2020;484-485:112832. doi: 10.1016/j.jim.2020.112832. Epub 2020 Aug 8. PMID: 32780998
  31. Crawford KHD, Eguia R, Dingens AS, Loes AN, Malone KD, Wolf CR, Chu HY, Tortorici MA, Veessler D, Murphy M, Pettie D, King NP, **Balazs AB**, Bloom JD. Protocol and Reagents for Pseudotyping Lentiviral Particles with SARS-CoV-2 Spike Protein for Neutralization Assays. (2020) *Viruses*. 2020 May 6;12(5):513. doi: 10.3390/v12050513. PMID: 32384820
  32. Keating CL, Kuhn E, Bals J, Cocco AR, Yousif AS, Matysiak C, Sangesland M, Ronsard L, Smoot M, Moreno TB, Okonkwo V, Setliff I, Georgiev I, **Balazs AB**, Carr SA, Lingwood D. Spontaneous Glycan Reattachment Following N-Glycanase Treatment of Influenza and HIV Vaccine Antigens. (2020) *J Proteome Res*. 2020 Feb 7;19(2):733-743. doi: 10.1021/acs.jproteome.9b00620. Epub 2020 Jan 24. PMID: 31913636
  33. Huang Q, Chan KY, Tobey IG, Chan YA, Poterba T, Boutros CL, **Balazs AB**, Daneman R, Bloom JM, Seed C, Deverman BE. Delivering genes across the blood-brain barrier: LY6A, a novel cellular receptor for AAV-PHP.B capsids. (2019). *PLoS One* 2019 Nov 14; doi: 10.1371/journal.pone.0225206. PMID: 31725765
  34. van den Berg FT, Makoah NA, Ali SA, Scott TA, Mapengo RE, Mutsvunguma LZ, Mkhize NN, Lambson BE, Kgagudi PD, Crowther C, Karim SA, **Balazs AB**, Weinberg MS, Ely A, Arbutnot PB, Morris L. AAV-Mediated Expression of Broadly Neutralizing and Vaccine-like Antibodies Targeting the HIV-1 Envelope V2 Region. (2019). *Mol. Ther. Methods Clin. Dev.* 2019 Sept; doi:10.1016/j.omtm.2019.06.002. PMID: 31334303
  35. Welles HC, Jennewein MF, Mason RD, Narpala S, Wang L, Cheng C, Zhang Y, Todd J, Lifson JD, **Balazs AB**, Alter G, McDermott AB, Mascola JR, Roederer M. Vectored delivery of anti-SIV envelope targeting mAb via AAV8 protects rhesus macaques from repeated limiting dose intrarectal swarm SIVsmE660 challenge. (2018). *PLoS Pathog.* 2018 Dec 5; doi: 10.1371/journal.ppat.1007395. PMID: 30517201
  36. Lin A, **Balazs AB**. Adeno-associated virus gene delivery of broadly neutralizing antibodies as prevention and therapy against HIV-1. (2018). *Retrovirology*. 2018 Oct 1;15(1):66. doi: 10.1186/s12977-018-0449-7. PMID: 30285769
  37. Brady JM, Baltimore D, **Balazs AB**. Antibody gene transfer with adeno-associated viral vectors as a method for HIV prevention. (2017). *Immunol Rev*. 2017 Jan;275(1):324-333. doi: 10.1111/imr.12478 PubMed PMID: 28133808
  38. Payne JG, Takahashi A, Higgins MI, Porter EL, Suki B, **Balazs A**, Wilson AA. Multilineage transduction of resident lung cells in vivo by AAV2/8 for  $\alpha$ 1-antitrypsin gene therapy. (2016) *Mol Ther*

*Methods Clin Dev.* 2016 Jun 29;3:16042. doi: 10.1038/mtm.2016.42. eCollection 2016. PMID: 27408904

39. Thomas DD, Sommer AG, **Balazs AB**, Beerman I, Murphy GJ, Rossi D, Mostoslavsky G. Insulin-like growth factor 2 modulates murine hematopoietic stem cell maintenance through upregulation of p57. (2016). *Exp Hematol.* 2016 May;44(5):422-433.e1. doi: 10.1016/j.exphem.2016.01.010. Epub 2016 Feb 10. PMID: 26872540
40. Akkina RK, Allam A, **Balazs AB**, Blankson J, Burnett JC, Casares S, Garcia JV, Hasenkrug K, Kashanchi F, Kitchen S, Klein F, Kumar P, Luster AD, Poluektova LY, Rao M, Sanders BE, Shultz LD, Zack JA. Improvements and Limitations of Humanized Mouse Models for HIV Research: NIH/NIAID "Meet the Experts" 2015 Workshop Summary. *AIDS Res Hum Retroviruses.* 2015 Dec 16 [Epub ahead of print]
41. Deal CE, **Balazs AB**. Engineering humoral immunity as prophylaxis or therapy. *Curr Opin Immunol.* 2015 Jul 14;35:113-122. doi: 10.1016/j.coi.2015.06.014. Review. PMID: 26183209
42. Saunders KO, Wang L, Joyce MG, Yang ZY, **Balazs AB**, Cheng C, Ko SY, Kong WP, Rudicell RS, Georgiev IS, Duan L, Foulds KE, Donaldson M, Xu L, Schmidt SD, Todd JP, Baltimore D, Roederer M, Haase AT, Kwong PD, Rao SS, Mascola JR, Nabel GJ. Broadly neutralizing human immunodeficiency virus type 1 antibody gene transfer protects non-human primates from mucosal simian-human immunodeficiency virus infection. *J. Virol* 2015; Epub Jun 3. PMID: 26041300
43. Deal CE, **Balazs AB**. Vectored antibody gene delivery for the prevention or treatment of HIV infection. *Curr Opin HIV AIDS* 2015; Epub 2015 Feb 19. PMID: 25700206
44. de Jong YP, Dorner M, Mommersteeg MC, Xiao JW, **Balazs AB**, Robbins JB, Winer BY, Gerges S, Vega K, Labitt RN, Donovan BM, Giang E, Krishnan A, Chiriboga L, Charlton MR, Burton DR, Baltimore D, Law M, Rice CM, Ploss A. Broadly neutralizing antibodies abrogate established hepatitis C virus infection. *Sci Transl Med* 2014 Sept 17; 6(254):254ra129. doi: 10.1126/scitranslmed.3009512 PMID: 25232181
45. Deal C, **Balazs AB**, Espinosa D, Zavala F, Baltimore D, Ketner G. Vectored antibody gene delivery protects against *Plasmodium falciparum* sporozoite challenge in mice. *Proc Natl Acad Sci* 2014 Aug 26; 111(34):12528-32. doi: 10.1073/pnas.1407362111 Epub: 2014 Aug 11. PMID: 25114213
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