

Curriculum vitae

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- G. *Other Affiliations* Adjunct Faculty, National Institute of Immunology
Adjunct Faculty, Translational Health Sciences and Technology
Adjunct Scientist, Christian Medical College, Vellore.
- H. *Education*
- M.D. in Microbiology (1982) : University of Bombay, India.
 - M.B.,B.S. (1979) : Univeristy of Poona, India
- I. *Professional Experience*
- January 2017 onwards: Professor, Division of Biology, Indian Institute of Science Education and Research, Pune, India.
 - December 2016 onwards: Adjunct Faculty, National Institute of Immunology, New Delhi, India.
 - June 2016 onwards : Adjunct Scientist, Division of Gastrointestinal Sciences, Christian Medical College, Vellore, India.
 - June 2010 onwards : Adjunct Professor, Pediatric Biology Centre, Translational Health Sciences & Technology Insitute, Faridabad, India; development and function of the human immune system in the context of infections and nutrition.
 - 1990-2016 : Scientist, National Institute of Immunology, New Delhi, India; cell fate decisions in the context of Th1 vs. Th2 pathways or memory vs. effector pathways or survival vs. death in T cells and macrophages.
 - 1989-1990 : Senior research officer, Royal Postgraduate Medical School, London, UK; mechanisms of induction of T cell tolerance *in vitro*.
 - 1986-1989 : Post doctoral scientist, MRC tuberculosis and related infections unit, London, UK; analysis of MHC-peptide-T cell receptor complexes at molecular level.
 - 1984 : Visiting research fellow [British Council], London School of Hygiene and Tropical Medicine, London, UK; detection of viral DNA in free and integrated form by DNA hybridisation.

- 1983-1986 : Research associate, Haffkine Institute, Bombay, India; clinical immunology of viral hepatitis.
- 1981-1983 : Senior research fellow [ICMR], Haffkine Institute, Bombay, India; development of ELISA for tuberculous meningitis.
- 1980-1981 : Research fellow, Haffkine Institute, Bombay, India; animal models for evaluation of indigenous drugs.

J. Research Grants [as Principal Investigator]

- 2016-2019: A project titled *To analyse contribution of cell intrinsic and extrinsic factors in determining T and B cell memory niche size* funded by Science and Engineering Research Board, Department of Science and Technology, Government of India.
- 2014-2017: A project titled *To study the relative role of T cell intrinsic and extrinsic factors in Th1 and Th2 differentiation, survival and memory* funded by the Department of Biotechnology, Government of India.
- 2012-2015: A project titled *Characterisation of consequences of aging on T cell function and survival* funded by the Department of Science and Technology, Government of India.
- 2010-2013: A project titled *Pathogenesis of idiopathic nephrotic syndrome of childhood: Th1/Th2 polarization of naïve T cells in patients with idiopathic nephrotic syndrome and its relation to disease course* funded by the Department of Biotechnology, Government of India (With Dr A Bagga, AIIMS as project co-ordinator)
- 2007-2010: A project titled *Cross-regulation of macrophage apoptosis by HIV-Nef and mycobacteria* funded by the Department of Biotechnology, Government of India.
- 2007-2010: A project titled *Analysis of apoptotic pathways involved in macrophages from Bruton's tyrosine kinase-deficient X-linked immunodeficient mice* funded by the Department of Science and Technology, Government of India.
- 2003-2006: A project titled *Innate immune recognition of filarial parasites by phagocytes* funded by the Indian Council of Medical Research, Government of India (with Dr B Ravindran, RMRC Bhubaneswar as co-principal investigator).
- 2001 to 2005: A project entitled *Scavenger receptor mediated reprogramming of Th2 immunity: analysis of mechanisms determining the selection and plasticity of the T cell repertoire* (with Prof JR Lamb, Respiratory Medicine Unit, University of Edinburgh, UK, as a collaborator) funded by the Wellcome Trust, UK.
- 2001 to 2004: A project entitled *Study of antigen presentation by T lymphocytes* funded by the Department of Science and Technology, Government of India.
- 1997 to 2001: A Collaborative Research Initiative Grant from the Wellcome Trust entitled *Control of allergic immune responses by allergen targeting via scavenger receptors* (with Prof JR Lamb, Respiratory Medicine Unit, University of Edinburgh, UK as the British collaborator).
- 1996 to 1999: A project entitled *Molecular analysis of T cell commitment to alternate cytokine profiles* funded by the Department of Science and Technology, Government of India (with Dr S Rath, National Institute of Immunology, New Delhi, India as co-investigator).
- 1994 to 1997: A project titled *Polymer mediated intracellular targeting of immunogens for enhanced efficacy* funded by the Department of Biotechnology, Government of India (with Dr MG Kulkarni, National Chemical Laboratory, Pune, India as the co-principal investigator).

- 1992 to 1995: A project titled *Activation of CD4+ T cell subsets in immune responses to bacterial antigens* funded by the Department of Science and Technology, Government of India (with Dr S Rath, National Institute of Immunology, New Delhi, India as the co-investigator).
- 1992 to 1995: An international exchange programme under the Higher Education Links Scheme of the British Council in collaboration with Prof. J. R. Lamb (Department of Immunology, St. Mary's Hospital Medical School, London, UK) and Dr. M. J. Owen (Imperial Cancer Research Fund, London, UK) on *Accessory signals and T cell activation*.

K. Publications

I. ORIGINAL PEER-REVIEWED PAPERS

1. Bal V, Rath S and Bhide MB (1982) Inhibition of certain biological effects of diphtheria toxin by an indigenous agent: a preliminary report. **Bull Haffkine Inst** 10 82-86.
2. Bal V, Kamat RS, Kamat J and Kandoth P (1983) Enzyme linked immunosorbent assay for mycobacterial antigens. **Indian J Med Res** 78 477-483.
3. Harrison TJ, Bal V, Wheeler EG, Meacock TJ, Harrison JF and Zuckerman AJ (1985) Hepatitis B virus DNA and e antigen in serum from blood donors from the United Kingdom positive for hepatitis B surface antigen. **Brit Med J** 290 663-664.
4. Rath S, Bal V and Bhide MB (1986) Mineralisation in experimental fracture repair estimated by tetracycline deposition. **Indian J Med Res** 83 202-209.
5. Mohite BJ, Rath S, Bal V, Kamat SA, Marathe SN, Zuckerman AJ and Kamat RS (1987) Mechanism of liver cell damage in acute hepatitis B. **J Med Virol** 22 199-210.
6. Bal V, Amin S, Rath S, Kamat SA, Zuckerman AJ and Kamat RS (1987) Virological markers and antibody responses in fulminant viral hepatitis. **J Med Virol** 23 75-82.
7. Rothbard JB, Lechler RI, Howland K, Bal V, Eckels DD, Sekaly R, Long EO, Taylor WR and Lamb JR (1988) Structural model of HLA-DR1 restricted T cell antigen recognition. **Cell** 52 515-523.
8. Lamb JR, Rees ADM, Bal V, Ikeda H, Wilkinson W, de Vries RRP and Rothbard JB (1988) Prediction and identification of an HLA-DR restricted T cell determinant in the 19kD protein of mycobacteria. **Eur J Immunol** 18 973-976.
9. Rath S, Bal V, Mohite BJ, Haridas V, Naik SR, Kamat SA, Zuckerman AJ and Kamat RS (1988) Anti-idiotypic humoral and cellular responses to antibody to hepatitis B surface antigen in hepatitis B viral infections. **Clin Exp Immunol** 73 360-365.
10. Young DB, Mehlert A, Bal V, Mendez-Samperio P, Ivanyi J and Lamb JR (1988) Stress proteins and the immune response to mycobacteria - Antigens as virulence factors? **Antonie van Leeuwenhoek J Microbiol** 54 431-439.
11. Lechler RI, Bal V, Rothbard JB, Germain RN, Sekaly R, Long EO and Lamb JR (1988) Structural and functional studies of HLA-DR restricted antigen recognition by human helper T cell clones using transfected murine cell lines. **J Immunol** 141 3003-3009.
12. Cox JH, Lamb JR, Bal V, Butcher GW, Howard JC, Owen MJ and Ivanyi J (1989) The phenotypic and molecular characterisation of Nb2 lymphoma cells activated with IL-2 and human growth hormone. **Immunology** 66 83-89.
13. Lamb JR, Bal V, Rothbard JB, Mehlert A, Mendez-Samperio P and Young DB (1989) The mycobacterial GroEL stress protein : a common target of T cell recognition in infection and autoimmunity. **J Autoimmunity** 2(supplement) 93-100.

14. Lechler RI, Bal V, Ikeda H, Trowsdale J, Rothbard JB and Lamb JR (1989) Reversal of an immune response gene effect by point mutation in the antigen sequence. **Transplantation Proceedings** 21 618-620.
15. O'Hehir RE, Bal V, Quint D, Moqbel R, Kay AB, Zanders ED and Lamb JR (1989) An *in vitro* model of allergen dependent IgE synthesis by human B lymphocytes: Comparison of the response of an atopic and a non-atopic individual to *Dermatophagoides* spp.(House dust mite). **Immunology** 66 499-504.
16. Lamb JR, Bal V, Mendez-Samperio P, Mehlert A, So A, Rothbard J, Jindal S, Young RA and Young DB (1989) Stress proteins may provide a link between the immune response to infection and autoimmunity. **Int Immunol** 1 191-196.
17. Rothbard JB, Busch R, Howland K, Bal V, Fenton C, Taylor WR and Lamb JR (1989) Structural analysis of a peptide-HLA class II complex : Identification of critical interactions for its formation and recognition by T cell receptor. **Int Immunol** 1 479-486.
18. Rothbard JB, Busch R, Bal V, Trowsdale J, Lechler RI and Lamb JR (1989) Reversal of HLA restriction by a point mutation in an antigenic peptide. **Int Immunol** 1 487-495.
19. Haridas V, Rath S, Bal V, Kulkarni AP, Plumber ST, Naik SR and Kamat RS (1990) Immune response to hepatitis B viral antigens in chronic infection and its relationship to liver necrosis. **Indian J Med Res** 91 247-251.
20. Bal V, McIndoe A, Denton G, Hudson D, Lombardi G, Lamb JR and Lechler RI (1990). Antigen presentation by keratinocytes produces tolerance in human T cells. **Eur J Immunol** 20 1893-1897.
21. O'Hehir RE, Mach B, Berte C, Greenlaw R, Tiercy J-M, Bal V, Lechler RI, Trowsdale J and Lamb JR (1990) Direct evidence for a functional role of HLA-DRB1 and DRB3 gene products in the recognition of *Dermatophagoides* spp. (House dust mite) by helper T lymphocytes. **Int Immunol** 2 885-892.
22. Barber LD, Bal V, Lamb JR, O'Hehir RE, Yendle J, Hancock RJT and Lechler RI (1991) Contribution of T-cell receptor-contacting and peptide-binding residues of the class II molecule HLA-DR4Dw10 to serologic and antigen-specific T cell recognition. **Human Immunol** 32 110-118.
23. Sidhu S, Deacock S, Bal V, Batchelor JR, Lombardi G and Lechler RI (1992) Human T cells cannot act as autonomous antigen presenting cells, but induce tolerance in antigen specific and alloreactive responder cells. **J Exp Med** 176 875-880.
24. Lechler R, Heaton T, Barber L, Bal V, Batchelor R and Lombardi G (1992) Molecular mimicry by major histocompatibility complex molecules and peptides accounts for some alloresponses. **Immunol Lets** 34 63-69.
25. Bal V, Lamb JR and Lechler RI (1993) Analysis of accessory signalling in human T cell clones. **Human Immunol** 37 101-107.
26. Thatte J, Rath S and Bal V (1993) Immunisation with live versus killed *Salmonella typhimurium* leads to the generation of an interferon-gamma-dominant versus an interleukin-4-dominant immune response. **Int Immunol** 5 1431-1436.
27. Satyaraj E, Rath S and Bal V (1994) Induction of tolerance in freshly isolated alloreactive CD4+ T cells by activated T cell stimulators. **Eur J Immunol** 24 2457-2461.
28. Abraham R, Singh N, Mukhopadhyay A, Basu SK, Bal V and Rath S (1995) Modulation of immunogenicity and antigenicity of proteins by maleylation to target scavenger receptors on macrophages. **J Immunol** 154 1-8.

29. Thatte J, Rath S and Bal V (1995) Analysis of immunisation route-related variation in the immune response to heat-killed *Salmonella typhimurium* in mice. **Infect Immun** 63 99-103.
30. Satyaraj E, Rath S and Bal V (1995) Induction of anergy in freshly isolated alloreactive CD4 T cells by activated T cell stimulators is not due to the CD28-B7 interaction. **J Immunol** 155 4669-4675.
31. Mendiratta SK, Singh N, Bal V and Rath S (1996) Analysis of T-cell hybridomas with an unusual MHC class II-dependent ligand specificity. **Immunology** 89 238-244.
32. Abraham A, Choudhury A, Basu SK, Bal V and Rath S (1997) Disruption of T cell tolerance by directing a self antigen to macrophage-specific scavenger receptors. **J Immunol** 158 4029-4035.
33. Gupta M, Satyaraj E, Durdik JM, Rath S and Bal V (1997) Differential regulation of T cell activation for primary versus secondary proliferative responses. **J Immunol** 158 4113-4121.
34. Pasare C, Morafo V, Entringer M, Bansal P, George A, Bal V, Rath S and Durdik JM (1998) Presence of activated antigen-binding B cells during immunization enhances relative levels of interferon- γ in T cell responses. **J Immunol** 160 778-787.
35. Singh N, Bhatia S, Abraham R, Basu SK, George A, Bal V and Rath S (1998) Modulation of T cell cytokine profiles and peptide-MHC complex availability *in vivo* by delivery to scavenger receptors via antigen-maleylation. **J Immunol** 160 4869-4880.
36. Gupta M, George A, Sen R, Rath S, Durdik JM and Bal V (1999) Presence of pentoxifylline during T cell priming increases clonal frequencies in secondary proliferative responses and inhibits apoptosis. **J Immunol** 162 689-695.
37. Pashine A, John B, Rath S, George A and Bal V (1999) Th1-dominance in the immune response to live *Salmonella typhimurium* requires bacterial invasiveness but not persistence. **Int Immunol** 11 481-489.
38. Pasare C, Noggle S, Entringer M, Heinzemann A, Bansal P, George A, Bal V, Rath S and Durdik JM (1999) Expression of a recombinant immunoglobulin heavy chain transgene in macrophage as well as lymphocyte lineages *in vivo*. **Eur J Immunol** 29 1219-1227.
39. Bansal P, Mukherjee P, Basu SK, George A, Bal V and Rath S (1999) MHC class I-restricted presentation of maleylated protein binding to scavenger receptors. **J Immunol** 162 4430-4437.
40. Mukhopadhyay S, Sahoo PK, George A, Bal V, Rath S and Ravindran B (1999) Delayed clearance of filarial infection and enhanced Th1 immunity due to modulation of macrophage APC function in *xid* mice. **J Immunol** 163 875-883.
41. Mukhopadhyay S, George A, Bal V, Ravindran B and Rath S (1999) Bruton's tyrosine kinase deficiency in macrophages inhibits nitric oxide generation leading to enhancement of interleukin-12 induction. **J Immunol** 163 1786-1792.
42. Garg S, Bal V, Rath S, George A (1999) Effect of multiple antigenic exposures in the gut on oral tolerance and induction of antibacterial systemic immunity. **Infect Immun** 67 5917-5924.
43. Choudhury A, Mukherjee P, Basu SK, George A, Rath A* and Bal V* (2000) Disruption of T cell tolerance and polyclonal B cell activation *in vivo* by immunization with self immunoglobulin maleylated for delivery to scavenger receptors. **J Immunol** 164 1713-1721.

44. Raman VS, Bal V, Rath S and George A (2000) Ligation of CD27 on murine B cells responding to T-dependent and T-independent stimuli inhibits the generation of plasma cells. **J Immunol** 165 6809-6815.
45. Pasare C, Mukherjee P, Verhoef A, Bansal P, Mendiratta SK, George A, Lamb JR, Rath S and Bal V (2001) T cells in mice expressing a transgenic human T cell receptor β chain get positively selected but cannot be activated in the periphery by signaling through T cell receptor. **Int Immunol** 13 53-62.
46. Mukherjee P, Dani A, Bhatia S, Singh N, Rudensky AY, George A, Bal V, Mayor S and Rath S (2001) Efficient presentation of both cytosolic and endogenous transmembrane protein antigens on MHC class II is dependent on cytosolic proteolysis. **J Immunol** 167 2632-2641.
47. Bhatia S, Mukhopadhyay S, Jarman E, Hall G, George A, Basu SK, Rath S, Lamb JR and Bal V. (2002) Scavenger receptor-specific allergen delivery elicits IFN- γ -dominated immunity and directs established Th2-dominated responses to a non-allergic phenotype. **J Allergy Clin Immunol** 109 321-328.
48. Mukhopadhyay S, Mohanty M, Mangla A, George A, Bal V, Rath S, and Ravindran B. (2002) Macrophage effector functions controlled by Bruton's tyrosine kinase are more crucial than the cytokine balance of T cell responses for microfilarial clearance. **J Immunol** 168 2914-2921.
49. John B, Rajagopal D, Pashine A, Rath S, George A and Bal V. (2002). Role of IL-12-independent and IL-12-dependent pathways in regulating generation of the IFN- γ component of T cell responses to Salmonella typhimurium. **J Immunol** 169 2545-2552.
50. Suresh R, Vig M, Bhatia S, Goodspeed EPB, John B, Kandpal U, Srivastava S, George A, Sen R, Bal V*, Durdik JM* and Rath S*. (2002) Pentoxifylline functions as an adjuvant in vivo to enhance T cell immune responses by inhibiting activation-induced death. **J Immunol** 169 4262-4272.
51. Vig M, George A, Sen R, Durdik J, Rath S*, Bal. V* (2002) Commitment of activated T cells to secondary responsiveness is enhanced by signals mediated by cAMP-dependent protein kinase A-I. **Mol Pharmacol** 62 1471-1481.
52. Nair DT, Kaur KJ, Singh K, Mukherjee P, Rajagopal D, George A, Bal V, Rath S, Rao KV, Salunke DM. (2003) Mimicry of native peptide antigens by the corresponding retro-inverso analogs is dependent on their intrinsic structure and interaction propensities. **J Immunol**. 170 1362-1373.
53. Raman VS, Akondy RS, Rath S, Bal V, George A. (2003) Ligation of CD27 on B cells in vivo during primary immunization enhances commitment to memory B cell responses. **J Immunol**. 171 5876-5881.
54. Vig M, Srivastava S, Kandpal U, Sade H, Lewis V, Sarin A, George A*, Bal V*, Durdik JM*, Rath S*. (2004) Inducible nitric oxide synthase in T cells regulates T cell death and immune memory. **J Clin Invest**. 113 1734-1742.
55. Mangla A, Khare A, Panday NN, Vineeth V, Mukhopadhyay A, Ravindran B, Bal V*, George A*, Rath S*. (2004) Pleiotropic consequences of Bruton's tyrosine kinase deficiency in myeloid lineages lead to poor inflammatory responses. **Blood** 104 1191-1197.
56. Parameswaran N, Samuvel DV, Kumar R, Thatai S, Bal V, Rath S, George A. (2004) Preferential commitment of T cells to effector capabilities following oral or systemic immunization with soluble antigens. **Infect Immun**. 72 3803-3811.
57. Dani A, Chaudhry A, Mukherjee P, Rajagopal D, Bhatia S, George A, Bal V, Rath S,

- Mayor S. (2004) The pathway for MHCII-mediated presentation of endogenous proteins involves peptide transport to the endo-lysosomal compartment. **J Cell Science** *117* 4219-4230.
58. Parameswaran N, Suresh R, Bal V, Rath S, George A. (2005) Lack of ICAM-1 on APCs during T cell priming leads to poor generation of central memory cells. **J Immunol** *175* 2201-2211.
59. Chaudhry A, Das SR, Hussain A, Mayor S, George A, Bal V, Jameel S, Rath S. (2005) The Nef protein of HIV-1 induces loss of cell surface costimulatory molecules CD80 and CD86 in APCs. **J Immunol** *175* 4566-4574.
60. Rajagopal D, Bal V, Mayor S, George A, Rath S. (2006) A role for the Hsp90 molecular chaperone family in antigen presentation to T lymphocytes via major histocompatibility complex class II molecules. **European J Immunol** *36* 828-841.
61. Chaudhry A, Das SR, Jameel S, George A, Bal V, Mayor S, Rath S. (2007) A two-pronged mechanism for HIV-1 Nef-mediated endocytosis of immune costimulatory molecules CD80 and CD86. **Cell Host Microbes** *1* 37-49.
62. Srivastava S, Banerjee H, Chaudhry A, Khare A, Sarin A, George A*, Bal V*, Durdik JM*, Rath S*. (2007) Apoptosis-inducing factor regulates death in peripheral T cells. **J Immunol**. *179* 797-803.
63. Chaudhry A, Das SR, Jameel S, George A, Bal V, Mayor S, Rath S. (2008) HIV-1 Nef induces a Rab 11-dependent routing of endocytosed immune costimulatory proteins CD80 and CD86 to the Golgi. **Traffic** *9* 1925-1935.
64. Chaudhry A, Verghese DA, Das SR, Jameel S, George A, Bal V, Mayor S, Rath S. (2009) HIV-1 Nef promotes endocytosis of cell surface MHC class II molecules via a constitutive pathway. **J Immunol**. *183* 2415-2424.
65. Mattoo H, Faulkner M, Kandpal U, Das R, Lewis V, George A*, Rath S*, Durdik JM*, Bal V*. (2009) Naïve CD4 T cells from aged mice show enhanced death upon primary activation. **Int. Immunol**. *21* 1277-1289.
66. Varanasi V, Mattoo H, Tupperwar NC, Thyagarajan K, Das A, Kumar R, Bal V*, Vaidya T*, George A*, Rath S*. (2010) A superantigen interacts with leishmanial infection in antigen-presenting cells to regulate cytokine commitment of responding CD4 T cells. **J. Infec. Dis**. *202* 1234-1245.
67. Satpathy S, Shenoy G, Kaw S, Bal V*, Rath S*, George A*. (2010) Inhibition of terminal differentiation of B cells mediated by CD27 and CD40 involves signalling through JNK. **J Immunol**. *185* 6499-6507.
68. Khare A, Viswanathan B, Gund R, Jain N, Ravindran B, George A*, Rath S*, Bal V*. (2011) Role of Bruton's tyrosine kinase in macrophage apoptosis. **Apoptosis** *16* 334-336.
69. Chatterjee P, Tiwari RK, Rath S*, Bal V*, George A*. (2012) Modulation of antigen presentation and BCR signaling in B cells of beige mice. **J Immunol** *188* 695-702.
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71. Shenoy GN, Chatterjee P, Kaw S, Mukherjee S, Rathore DK, Bal V*, Rath S*, George A*. (2012) Recruitment of memory B cells to lymph nodes remote from the site of immunization requires an inflammatory stimulus. **J Immunol** *189* 521-528.

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73. Sinha A, Gulati A, Saini S, Blanc C, Gupta A, Gurjar BS, Saini H, Kotresh ST, Ali U, Bhatia D, Ohri A, Kumar M, Agarwal I, Gulati S, Anand K, Vijaykumar M, Sinha R, Sethi S, Saloma M, George A, Bal V, Singh G, Dinda AK, Hari P, Rath S, Dragon-Durey M-A, Bagga A. (2014) Prompt plasma exchanges and immunosuppressive treatment improves the outcomes of anti-factor H autoantibody-associated hemolytic uremic syndrome in children. **Kidney International** 85 1151-1160.
74. Saini S, Shenoy G, Rath S*, Bal V*, George A* (2014) Inducible nitric oxide synthase is a major intermediate in signaling pathways for the survival of plasma cells. **Nature Immunology** 15, 275-282.
75. Upadhyay M, Priya GK, Ramesh P, Madhavi MB, Rath S, Bal V, George A and Vaidya T. (2014) CD40 signaling drives B lymphocytes into an intermediate memory-like state, poised between naïve and plasma cells. **Journal of Cellular Physiology** 229, 1387-1396.
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79. Basu S, Kaw S, D'Souza L, Vaidya T, Bal V*, Rath S*, George A* (2016). Constitutive CD40 Signaling Calibrates Differentiation Outcomes in Responding B Cells via Multiple Molecular Pathways. **J Immunol** 197, 761-770.
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82. Jain N, Oswal N, Chawla AS, Agrawal T, Biswas M, Vrati S, Rath S*, George A*, Bal V*, Medigeshe GR* (2017). CD8 T cells protect adult naive mice from JEV-induced morbidity via lytic function. **PLoS Neglected Tropical Diseases** 11, e0005329.
83. Tanwar S, Dhar A, Varanasi V, Mukherjee T, Boppana R, Basak S, Bal V, George A and Rath S (2017). Mediation of transitional B cell maturation in the absence of functional Bruton's tyrosine kinase. **Scientific Reports** 7, 46029.
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87. Das A, Ranganathan V, Umar D, Thukral S, George A*, Rath S*, Bal V*(2017). Effector/memory CD4 T cells making either Th1 or Th2 cytokines commonly co-express T-bet and GATA-3. **PLoSOne** 12, e0185932. (doi: 10.1371/journal.pone.0185932)

[* indicates joint senior authorship]

II. INVITED AND/OR REVIEW PAPERS

1. Kamat RS and Bal V. (1983) Immunity in salmonellosis. **Bull Haffkine Inst** 11 1-6.
2. Rath S, Bal V, Mohite BJ, Naik SR, Zuckerman AJ and Kamat RS. (1987) Antidiotypic humoral and cellular responses to anti-HBs in acute and chronic hepatitis B virus infections. **Viral Hepatitis and Liver Disease**, ed. AJ Zuckerman, Alan R Liss Inc New York, p 660.
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