

## Scientist profile

1. **Name** : **Dr. Ramalingam Bethunaickan**
2. **Designation** : Scientist - D & DBT-Ramalingaswami Fellow
3. **Complete Postal Address** : Department of Immunology,  
National Institute for Research in Tuberculosis (ICMR)  
No. 1. Sathyamoorthy Road, Chetput,  
Chennai -600 031. India.
3. **Telephone Number** : +91-44-28369761 **Fax:** +91-44-28362528
- E-mail** : [ramalingam.b@nirt.res.in](mailto:ramalingam.b@nirt.res.in); [bramalingam@gmail.com](mailto:bramalingam@gmail.com);
4. **Date of Birth** : 07-11-1973.
5. **Educational Qualification** : Degrees obtained (Begin with Bachelor's Degree)

| <b>Degree</b> | <b>Institution</b>  | <b>FIELD(S)</b>                      | <b>YEAR</b> |
|---------------|---|--------------------------------------|-------------|
| B. Sc.        | Bharadhasan University, Tiruchirapalli, India   | Zoology                              | 1994        |
| M. Sc.        | University of Madras, Guindy, Chennai, India  | Special Zoology                      | 1996        |
| Ph.D.         | Tuberculosis Research Centre (ICMR)/<br>The Tamil Nadu Dr. MGR medical University/<br>Chennai-India | Bio Medical Sciences<br>(Immunology) | 2003        |

### 6. Research and Professional Experience:

- June 2015- Till Date : Scientist 'D'/DBT Ramalingaswami Fellow, Department of Immunology,  
NIRT (ICMR), Chetput, Chennai-India.
- Dec 2013 - May 2015 : Assistant Investigator, Feinstein Institute for Medical Research,  
Manhasset, New York, USA.
- Feb 2007- Dec 2013 : Post Doctoral Research Scientist, Feinstein Institute for Medical Research,  
Manhasset, New York, USA.
- Sep 2005 - Feb 2007 : Post Doctoral Research Scientist, Columbia University, New York, USA.
- May 2003 - Feb 2005 : Post Doctoral Research at Institute Pasteur de Lille, France.

## 7. Research Specialization (Major scientific fields of interest)

1. Cloning, Expression, Purification and Characterization of Mycobacterial Proteins
2. Cellular and Humoral Immunology with *Mycobacterium tuberculosis*
3. Characterization of Mononuclear Phagocytes among animal models and humans
4. Molecular Immunology of Macrophage biology in Inflammation and Infection
5. Transcriptomics , Gene Expression and Pathway analysis across Murine and human models

## 8. Professional Society Membership:

1. Life Member, Indian Immunology Society, 1999 - present
2. New York Academy of Sciences 2007 – present.
3. Federation of Clinical Immunological Society (FOCIS) , member, since Jan-2014 - present

## 9. Awards and Honors:

- 2014 “Ramalingaswami Fellowship” from DBT, Ministry of Science and Technology, Government of India.
- 2010 key personnel, NIH- R01 DK085241-01
- 2006 New York SLE Foundation basic research Fellowship Grant Award from July 2006-June 2009 for ‘Mechanism of remission in Lupus Nephritis’
- 2003 CEFIPRA/IFCPAR Post Doctoral Fellowship for two years.
- 2001 EGIDE Fellowship for International studies in France during Ph.D.
- 1999 CSIR Senior Research Fellowship from Government of India.
- 1996 Junior Research Fellowship / National Eligibility Test (JRF-NET)  
Examination conducted by Council of Scientific and Industrial Research (CSIR) Government of India (A national level examination for awarding research Fellowship).
- 1994 Jawaharlal Nehru Memorial Fund Prize for Science and Technology.
- 1994 Prof. (Tmt.) Susheela Clements Endowment Prize GOLD MEDAL in recognition of Performance in B.Sc., for obtaining FIRST RANK in Bharathidasan University.
- 1994 General proficiency in B.Sc.

## 10. Publications:

1. Davidson A, **Bethunaickan R**, Berthier C, Sahu R, Zhang W, Kretzler M. Molecular studies of lupus nephritis kidneys. 2015; *Immunol. Res.* PMID: 26376897
2. Boneparth A, Huang W, **Bethunaickan R**, Woods M. Sahu R, Arora S, Akerman M, Lesser M and Davidson A. TLR7 influences germinal center selection in murine SLE. *PLoS ONE*. 2015; 10(3); e0119925. PMID:25794167.
3. **Bethunaickan R**, Berthier CC, Zhang W, Eksi R, Li H, Guan Y, Kretzler M, and Davidson A. Identification of stage specific genes associated with lupus nephritis and response to remission induction in NZB/W and NZM2410 mice. *Arthritis and Rheum.* 2014. (In Press) PMID: 24757019 .

4. Sahu R, **Bethunaickan R**, Singh S and Davidson A. Structure and function of renal macrophages and dendritic cells from SLE prone mice. *Arthritis Rheum*. 2013. 2012: 64 (10):3399–3408. PMID: 22674120.
5. **Bethunaickan R**, Berthier C, Zhang W, Kretzler M, and Davidson A. Comparative transcriptional profiling of 3 murine models of SLE nephritis reveals both unique and shared regulatory networks. *PLoS ONE* - 01/2013; 8(10):e77489. PMID: 24167575
6. Liu Z, **Bethunaickan R**, Sahu R, Brenner M, Laragione T, Gulko PS, Davidson A. The multiple chemokine-binding Bovine Herpesvirus 1 Glycoprotein G (BHV1gG) inhibits polymorphonuclear cell by not monocyte migration into inflammatory sites. *Mol Med*. 2013. 19: 276-285.PMID: 23979709.
7. Mosini I, Huang W, **Bethunaickan R**, Sahu R, Ricketts PG, Akerman M, Eilat D, Lesser M, Davidson A. The Yaa locus and IFN $\alpha$  fine tune germinal center B cell selection in murine SLE. The *Journal of Immunology*. 2012: 189: 4305–4312. PMID: 23024275.
8. **Bethunaickan R**, Sahu R, Liu Z, Tang YT, Huang W, Edegbe O, Tao H, Ramanujam M, Madaio MP and Davidson A. Anti-TNF treatment of IFN induced lupus nephritis reduces the renal macrophage response but does not alter glomerular immune complex formation. *Arthritis Rheum*. 2012: 64 (10):3399–3408. PMID: 22674120.
9. **Bethunaickan R**, Sahu R and Davidson A. Analysis of renal mononuclear phagocytes in murine models of SLE. *Methods Mol Biol*. 2012; 900:207-32. PMID: 22933071.
10. Berthier C \*, **Bethunaickan R** \*, Gonzalez-Rivera T \*, Nair V, Ramanujam M, Zhang W, Bottinger EP, Segerer S, Cohen CD, Davidson A, and Kretzler M. Cross-species transcriptional network analysis defines shared inflammatory responses in murine and human lupus nephritis. The *Journal of Immunology*. 2012: 189: 988-1001.PMID:22723521. (\* - Authors contributed equally to the work)
11. **Bethunaickan, R.** and Davidson, A. Process and Analysis of Kidney Infiltrates by Flow Cytometry from Murine Lupus Nephritis. *Bio-protocol*. 2012; 2(9): e167. <http://www.bio-protocol.org/e167>
12. **Bethunaickan, R.** and Davidson, A. (2012). Isolation of Dendritic Cells and Macrophages from the Murine Kidneys of Lupus by Cell Sorter. *Bio-protocol*. 2012;2(8): e168. <http://www.bio-protocol.org/e168>
13. Ranganathan, U. D., **Bethunaickan, R.** and Raja, A. Isolation of Circulating Immune Complexes from TB Patient Serum for Serodiagnosis. *Bio-protocol*. 2012.2(11): e188. <http://www.bio-protocol.org/e188>
14. Huang W, Moisini I, **Bethunaickan R**, Sahu R, Akerman M, Eilat D, Lesser M, Davidson A. BAFF/APRIL Inhibition Decreases Selection of Naive but Not Antigen- Induced Autoreactive B Cells in Murine Systemic Lupus Erythematosus. The *Journal of Immunology*. 2011: 187: 6571–6580.PMID:22102726.
15. Liu Z, **Bethunaickan R**, Huang W, Ramanujam M, Madaio MP and Davidson A. Interferon- $\alpha$  confers resistance to SLE nephritis to therapy to NZB/W F1 mice. The *Journal of Immunology*. 2011: 187; 1506-1513.PMID:21705616.
16. **Bethunaickan R**, Berthier C, Ramanujam M, Sahu R, Zhang W, Sun Y, Bottinger E, Ivashkiv L, Kretzler M, and Davidson A. A unique hybrid renal mononuclear phagocyte activation phenotype in murine SLE Nephritis. The *Journal of Immunology*. 2011; 186; 4994-5003.PMID:21411733.

17. Liu Z, **Bethunaickan R**, Huang W, Lodhi U, Solano I, Madaio MP, Davidson A. Interferon- $\alpha$  accelerates murine systemic lupus erythematosus in a T cell-dependent manner. *Arthritis Rheum.* 2011; 63(1):219-29. PMID: 20954185.
18. Ramanujam M, **Bethunaickan R**, Huang W, Tao H, Madaio MP, Davidson A. Selective blockade of BAFF for the prevention and treatment of systemic lupus erythematosus nephritis in NZM2410 mice. *Arthritis Rheum.* 2010 May;62(5):1457-68. PMID:20131293.
19. Kahn P, Ramanujam M, **Bethunaickan R**, Huang W, Tao H, Madaio MP, Factor SM, Davidson A. Prevention of murine antiphospholipid syndrome by BAFF blockade. *Arthritis Rheum.* 2008; 58(9):2824-34.PMID:18759321.
20. Raja A, Uma Devi KR, and **Bethunaickan R**. Improved diagnosis of pulmonary tuberculosis by detection of antibodies against multiple Mycobacterium tuberculosis antigens. *Diagn. Microbiol. Infect. Dis.* 2008;60:361-368.PMID:18206332.
21. Schiffer L, **Bethunaickan R**, Ramanujam M, Huang W, Schiffer M, Tao H, Madaio MP, Bottinger EP, and Davidson A. Activated Renal Macrophages Are Markers of Disease Onset and Disease Remission in Lupus Nephritis. *The Journal of Immunology.* 2008; 180 (3):1938-1947.PMID:18209092.
22. **Ramalingam Bethunaickan**, Alain R. Baulard, Camille Locht and Raja A. Antibody response in pulmonary tuberculosis against recombinant 27kDa (MPT51, Rv3803c) protein of Mycobacterium tuberculosis. *Scand J. Infect Dis.* 2007;39(10):867-874.PMID: 17852894.
23. Srivastava V, Rouanet C, Srivastava R, **Ramalingam B**, Locht C, Srivastava BS. Macrophage-specific Mycobacterium tuberculosis genes: identification by green fluorescent protein and kanamycin resistance selection. *Microbiology.* 2007; 153(Pt 3):659-666.PMID:17322185.
24. Alamelu Raja, Uma Devi KR, and **Ramalingam B**. Clinical value of specific detection of immune complex-bound antibodies in pulmonary tuberculosis. *Diagn. Microbiol. Infect. Dis.* 2006; 56(3):281-7.PMID:16876372.
25. Alamelu Raja, Uma Devi KR, **Ramalingam B** and Patrick J. Brennan. Improved diagnosis of pulmonary tuberculosis by detection of free and immune complex bound anti – 30kDa antibodies. *Diagn. Microbiol. Infect. Dis.* 2004; 50 (4):253-259.PMID:15582298.
26. **Ramalingam B**, Alain R. Baulard, Camille Locht , Narayanan PR and Raja A. Cloning expression and purification of the 27kDa (MPT51, Rv3803c) protein of Mycobacterium tuberculosis. *Protein Expression and Purification.* 2004; 36 (1):53-60.PMID:15177284.
27. Uma Devi KR, **Ramalingam B** and Raja A Antibody response to Mycobacterium tuberculosis 30 and 16kDa antigens in pulmonary tuberculosis with human immunodeficiency virus coinfection. *Diagn. Microbiol. Infect. Dis.* 2003 Jul;46(3):205-209.PMID:12867096.
28. **Ramalingam B**, Uma Devi KR, and Raja A. Isotype-specific anti-38 and 27 kDa (mpt 51) response in pulmonary tuberculosis with human immunodeficiency virus coinfection. *Scand J. Infect Dis.* 2003; 35(4):234-239.PMID:12839150.
29. Uma Devi KR, **Ramalingam B** and Alamelu Raja. Qualitative and quantitative analysis of antibody response in childhood tuberculosis against antigens of Mycobacterium tuberculosis. *Indian Journal of Medical Microbiology.* 2002; 20 (3); 145-149.PMID:17657054.

30. Alamelu Raja, Uma Devi KR, **Ramalingam B** and Patrick J. Brennan. Immunoglobulin G, A and M responses in serum and circulating immune complexes elicited by the 16-Kilodalton antigen of Mycobacterium tuberculosis. ***Clinical and Diagnostic Laboratory Immunology***. 2002; 9 (2): 308-312. PMID: 11874868.
31. Uma Devi K.R., Senthil Kumar K.S., **Ramalingam B** and Alamelu Raja. Purification and characterization of three immunodominant proteins (38, 30 and 16 kDa) of Mycobacterium tuberculosis. ***Protein Expression and Purification***. 2002; 24:188-195.PMID:11858712.
32. **Ramalingam B**, Uma Devi KR, Soumya Swaminathan and Alamelu Raja. Isotype specific antibody response in childhood tuberculosis against purified 38kDa antigen of Mycobacterium tuberculosis. ***Journal of Tropical Pediatrics***. 2002, 48 (3): 188–189. PMID: 12164607.
33. Alamelu Raja, Uma Devi KR, **Ramalingam B** and Vijayasekeran D. Serologic response to a secreted (30kDa) and a cytosolic (16kDa) antigen of Mycobacterium tuberculosis in childhood tuberculosis. ***The Pediatric Infectious Disease Journal***. 2001; 20:1161-1165.PMID:11740324.
34. Uma Devi KR, **Ramalingam B**, Brennan PJ, Narayanan PR, Alamelu Raja. Specific and early detection of IgG, A and M antibodies to Mycobacterium tuberculosis 38kDa antigen in pulmonary tuberculosis. ***Tuberculosis***. 2001; 81:249-253.PMID:11466037.

#### **Book chapters:**

35. **Bethunaickan R**, Sahu R and Davidson A. Analysis of renal mononuclear phagocytes in murine models of SLE. Autoimmunity: Methods and protocols. Springer Protocols: Methods in Molecular Biology 900: Humana Press; 2<sup>nd</sup> Edition 2012, Edited by Andras Perl, MD, Ph.D. (ISBN: 978-1-60761-719-8)

#### **Ongoing Research support:**

1. Title : *Molecular analysis of Monocyte subsets in humans infected with Mycobacterium Tuberculosis*  
 Role : Principal Investigator  
 Agency : DBT, Ministry of Science and Technology, Government of India.  
 Type : NRI Re-entry Fellowship  
 Amount : 95 Lakhs  
 Period : June-2015 to June-2020
2. Title : *Altered renal circadian rhythm in SLE Nephritis*  
 Role : Senior Key Personnel  
 Agency : Lupus Research Institute, USA  
 Type : Novel Research Grant  
 Amount : \$234,000  
 Period : Jan-2015 to Jan-2017