

## CURRICULUM VITAE

**Rohan Dhiman, Ph.D.**

### PERSONAL INFORMATION

Name in full	Rohan Dhiman
Business Address	Associate Professor, Department of Life Science, National Institute of Technology, Rourkela, 769008 Odisha, India
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Citizenship	India



### EDUCATION

B. Sc. (Botany Hons.)	Department of Botany, Panjab University, Chandigarh, India, 1999
M. Sc. (Botany Hons.)	Department of Botany, Panjab University, Chandigarh, India, 2001
Ph.D.	Institute of Microbial Technology, Chandigarh, India, 2008 (Registration with Jawahar Lal Nehru University, Delhi, India)

### HONORS AND AWARDS

1. Junior Research Fellowship, Council of Scientific and Industrial Research, Govt. of India, 2002-2004.
2. Senior Research Fellowship, Council of Scientific and Industrial Research, Govt. of India, 2004-2007.
3. CPIDC, University of Texas Health Science Centre at Tyler, TX, USA, shining star award given on June, 2010.
4. Laboratory travel award to attend 98<sup>th</sup> annual meeting of American Association of Immunologists at San Francisco, CA from May 13-17, 2011.
5. DST-INSPIRE Faculty award, 2014 (Biomedical)

## PROFESSIONAL BACKGROUND

Jan., 2008 – April, 2011	Post-doctoral Research Associate, Department of Microbiology & Immunology, Center for Pulmonary and Infectious Disease Control, University of Texas Health Science Center at Tyler, Tyler, TX, USA.
May, 2011 – Jan., 2012	Instructor, Department of Microbiology & Immunology, Center for Pulmonary and Infectious Disease Control, University of Texas Health Science Center at Tyler, Tyler, TX, USA.
Feb., 2012 – Feb., 2014	Research Scientist, Translational Health Science and Technology Institute, Plot No. 496, Phase-III, Udyog Vihar, Gurgaon, India, 122016
Feb., 2014 – Feb., 2020	Assistant Professor, Department of Life Science, National Institute of Technology, Rourkela, 769008, Odisha, India
Feb., 2020 – Current	Associate Professor, Department of Life Science, National Institute of Technology, Rourkela, 769008, Odisha, India

## PROFESSIONAL MEMBERSHIP

1. Life Member (#L26366) The Indian Science Congress Association
2. Life Member (LM/IIS/415/02/15) Indian Immunology Society

## RESEARCH ACTIVITIES

### Major Area of Research Interest

Innate and adaptive immune responses to human *M. tuberculosis* infection.

### Summary of Research Work

#### Ph.D. work:

1. Studied the role of NF- $\kappa$ B in apoptosis of virulent (*Mycobacterium tuberculosis* H37Rv) and avirulent (*M. tuberculosis* H37Ra) mycobacteria infected THP-1 cells.
2. Virulent and avirulent mycobacteria were found to possess differential NF- $\kappa$ B activation potential.
3. Virulent mycobacterium was shown to inhibit apoptosis of infected macrophages compared to avirulent mycobacterium by activating NF- $\kappa$ B for long time.

4. Apoptosis inhibition by virulent mycobacteria was found to be regulated by NF- $\kappa$ B dependent bcl-2 family anti-apoptotic member, bfl-1/A1.
5. bfl-1/A1 was shown to decrease mycobacterium killing by inhibiting phago-lysosome fusion.

**Post-doctoral Work:**

**Project 1: Role of IL-22 in human *M. tuberculosis* infection and its effect on NK cell mediated protection in BCG vaccination**

1. Human NK cells were found to contribute to immune defenses against *Mycobacterium tuberculosis* through production of IL-22.
2. NK cells were found to secrete IL-15 and IL-23 dependent IL-22 when exposed to autologous monocytes and  $\gamma$ -irradiated *M. tuberculosis*.
3. IL-15-stimulated NK cells expressed 10.6 times more DAP10 mRNA compared to control NK cells, and DAP10 siRNA inhibited IL-15-mediated IL-22 production by NK cells.
4. Soluble factors produced by IL-15-activated NK cells inhibited growth of *M. tuberculosis* in macrophages, and this effect was reversed by anti-IL-22.
5. Addition of rIL-22 to infected macrophages enhanced calgranulin A expression which led to retardation of mycobacterial growth by enhancing phagolysosomal fusion and increased Rab7 and reduced Rab14 expression.
6. BCG vaccination enhanced the number of IFN- $\gamma$ -IL-22-producing NK cells, depletion of NK1.1<sup>+</sup> cells at the time of BCG vaccination increased the number of immunosuppressive Tregs (CD4<sup>+</sup>CD25<sup>hi</sup>, 95% Foxp3<sup>+</sup>) after challenge with *M. tb* H37Rv, and NK1.1<sup>+</sup> cells lysed expanded but not natural Tregs in BCG-vaccinated mice.
7. Depletion of NK1.1<sup>+</sup> cells at the time of BCG vaccination also increased the bacillary burden and reduced T-cell responses after challenge with *M. tb* H37Rv.
8. IL-22 at the time of vaccination decreased bacillary burden and enhanced antigen-specific CD4<sup>+</sup> cell responses in BCG-vaccinated mice after challenge with *M. tb* H37Rv.

**Project 2: Role of c-MAF in different subpopulations of human monocyte-derived macrophages (MDMs) against *M. tuberculosis* infection**

1. *M. tuberculosis* H37Rv grew 5.6-fold more rapidly in human CD14<sup>hi</sup> MDMs, compared to CD14<sup>lo</sup>CD16<sup>hi</sup> MDMs and CD14<sup>hi</sup> monocytes produced higher amounts of IL-10, compared to CD14<sup>lo</sup>CD16<sup>hi</sup> monocytes, upon culturing with  $\gamma$ -irradiated *M. tb*.
2. Expression of mRNA for c-maf, a transcription factor, was up-regulated in  $\gamma$ -irradiated *M. tb*-stimulated CD14<sup>hi</sup> monocytes, compared to CD14<sup>lo</sup>CD16<sup>hi</sup> cells and c-maf siRNA inhibited IL-10 production by CD14<sup>hi</sup> monocytes leading to inhibition of virulent *M. tb* growth.
3. In healthy donors, recombinant IL-10 (rIL-10) marginally enhanced *M. tb* growth in

CD14<sup>lo</sup>CD16<sup>hi</sup> MDMs and had no effect on *M. tb.* growth in CD14<sup>hi</sup> cells, suggesting that c-maf-dependent *M. tb.* growth is not dependent on IL-10.

4. Whole genome microarray analysis of  $\gamma$ -irradiated *M. tb.* cultured CD14<sup>hi</sup> and CD14<sup>lo</sup>CD16<sup>hi</sup> monocytes indicates that 22 of 230 highly expressed genes in CD14<sup>hi</sup> cells have a c-maf binding site in their promoter region. Among these genes, hyaluronan synthase 1 (HAS1) mRNA was up-regulated in *M. tb.*-exposed CD14<sup>hi</sup> monocytes compared to CD14<sup>lo</sup>CD16<sup>hi</sup> monocytes.
5. c-maf siRNA inhibited HAS1 expression in *M. tb.*-stimulated CD14<sup>hi</sup> monocytes and HAS1 siRNA inhibited virulent *M. tb.* growth in CD14<sup>hi</sup> MDMs.
6. *M. tuberculosis* H37Rv upregulated expression of HAS1 protein and its product, hyaluronan, in CD14<sup>hi</sup> MDMs.

### **Project 3: Role of Rho GDP dissociation inhibitor produced by apoptotic cells in inhibiting mycobacterial growth**

1. Subpopulation of CD4<sup>+</sup>CD25<sup>+</sup> (85% Foxp3<sup>+</sup>) cells from persons with latent tuberculosis infection inhibits growth of *M. tb.* in human monocyte-derived macrophages.
2. A soluble factor, Rho GDP dissociation inhibitor (D4GDI), produced by apoptotic CD4<sup>+</sup>CD25<sup>+</sup> (85% Foxp3<sup>+</sup>) cells is responsible for this inhibition of *M. tb.* growth in human macrophages and in mice.
3. D4GDI inhibited growth of *M. tb.* in MDMs by enhancing production of IL-1 $\beta$ , TNF- $\alpha$  and ROS, and by increasing apoptosis of *M. tb.*-infected MDMs.
4. D4GDI was concentrated at the site of disease in tuberculosis patients, with higher levels detected in pleural fluid than in serum.
5. *M. tb.*-expanded CD4<sup>+</sup>CD25<sup>+</sup> (85% Foxp3<sup>+</sup>) cells and D4GDI induced intracellular *M. tb.* to express the dormancy survival regulator DosR and DosR-dependent genes.

### **Funding**

#### **Present**

**Nil**

#### **Past**

1. DST-SERB EEQ Project. "Soybean lectins and their antimycobacterial role by regulating autophagy". PI. 2017-2020. Rs. 25.66 Lakh.
2. DST-INSPIRE Faculty award. "To study the antimycobacterial role of calcium ionophores by inducing autophagy of mycobacteria infected macrophages". PI. 2014 – 2020. Rs. 34.50 Lakh.
3. DST-SERB EMR project. "To study the effect of major immunodominant antigens of mycobacteria on Calcimycin - induced autophagy in infected macrophages". PI. 2016-2019. Rs. 44.96 Lakh.

4. The Potts Memorial Foundation, New York. "Role of IL-22 produced by human Natural Killer cells (NK) cells in *Mycobacterium tuberculosis* (M. tb) infection". PI. 26/10/2010 – 25/10/2011. \$30,200.

### Manuscript reviewer

PLoS ONE, Indian Journal of Medical Research, Journal of Immunological Methods, Human Immunology, Cellular and Molecular Immunology, Journal of Leukocyte Biology, Life Sciences

### TEACHING

#### (a) Teaching Experience

Duration	Organization	Area(s)
1. July 2014 – continuing	National Institute of Technology Rourkela	Cell Biology and cellular techniques, Plant Science, Genetics, General Biology

#### (b) Subjects taught / currently teaching

Course Number & Title	UG/PG/Ph.D. Level	Year taught
LS-100 Biology	UG Level	2014–15, 2015-16, 2017-18, 2019-20 (Spring Semester)
LS-204 Plant Science	UG Level	2014–15, 2015-16, 2016–17, 2017-18, 2018-19, 2019-20 (Spring Semester)
LS-274 Plant Science Laboratory	UG Level	2016–17, 2018-19, 2019-20 (Spring Semester)
LS-303 Genetics	UG Level	2015–16, 2016-17, 2017-18, 2018-19, 2019-20 (Autumn Semester)
LS-311 Cell and Cellular Technique	UG Level	2014–15, 2015–16, 2016-17, 2017-18, 2019-20 (Autumn Semester)

LS-593 Seminar and Technical Writing	PG Level	2014–2015, 2015–16 (Autumn Semester)
LS-602 Advanced Immunology	Ph.D. Level	2014–15 (Autumn and Spring Semester), 2015-16, 2016-17, 2017-18, 2018-19, 2019-20 (Spring Semester)

**Thesis (Supervised/Supervision undergoing):****Doctoral:**

Supervised:

Awarded: One

Submitted: Nil

Supervision undergoing: Four

Co-supervised:

Awarded: One

Submitted: Nil

Supervision undergoing: Nil

**Masters:**

Supervised: Nine

Supervision undergoing: Six

**Publications****Published Research Articles:**

- Eira Choudhary, Cynthia Bullen, Renu Goel, Alok Singh, Monali Praharaj, Preeti Thakur, **Rohan Dhiman**, William Bishai, Nisheeth Agarwal. 2020. Relative and quantitative phosphoproteome analysis of macrophages in response to infection by virulent and avirulent *Mycobacteria* reveals a distinct role of the cytosolic RNA sensor RIG-I in *M. tuberculosis* pathogenesis. **J Proteome Res. (In Press)**.
- Diana Pradhan, Jasmin Pradhan, Abtar Mishra, Kapudeep Karmakar, **Rohan Dhiman**, Dipshikha Chakravorty, Vidya D. Negi. 2020. Immune modulations and survival strategies of evolved hypervirulent Salmonella Typhimurium strains. **Biochim Biophys Acta. 1864(8):129627**.
- Madhavan Omanakuttan, Vijaya R. Dirisala, Hanumohan R. Konatham, M. Madhuri, Malathi Jojula, Shradha Mawatwal, **Rohan Dhiman**. 2020. Deciphering the biological activity of recombinant guinea pig proteins. **Curr Trends Biotechnol Pharm. 14(1):44-47**.

- Ribhav Mishra, Ayeman Amanullah, Arun Upadhyay, **Rohan Dhiman**, Ankur Rakesh Dubey, Sarika Singh, Amit Prasad, Amit Mishra. 2020. Ubiquitin Ligase LRSAM1 Suppresses Neurodegenerative Diseases Linked Aberrant Proteins Induced Cell Death. **Int J Biochem Cell Biol.** **120:105697.**
- Garima Arora, Gagandeep, Assirbad Behura, Tannu Priya Gosain, Ravi P Shaliwal, Saqib Kidwai, Padam Singh, Shamseer Kulangara Kandi, **Rohan Dhiman**, Diwan S Rawat, Ramandeep Singh. 2020. NSC 18725, a pyrazole derivative inhibits growth of intracellular *Mycobacterium tuberculosis* by induction of autophagy. **Front Microbiol.** **10:3051.**
- Tulasi Barik, Avishek Ghosh, Abtar Mishra, **Rohan Dhiman**, Takahiro Sasamori, Saurav Chatterjee. 2020. Bioactive 1,1'-unsymmetrical bi-functional ferrocenyl compounds using a novel solvent free one pot multicomponent reaction method. **J Organomet Chem.** **908:121095.**
- Dibyananda Majhi, Krishnendu Das, Abtar Mishra, **Rohan Dhiman**, Braj Gopal Mishra. 2020. One pot synthesis of CdS/BiOBr/Bi<sub>2</sub>O<sub>2</sub>CO<sub>3</sub>: A novel ternary double z-scheme heterostructure photocatalyst for efficient degradation of atrazine. **Applied Catalysis B: Environmental.** **260:118222.**
- Madhavan Omanakuttan, Hanumohan R. Konatham, Vijaya R. Dirisala, Amminikutty Jeevan, Shradha Mawatwal, **Rohan Dhiman**, Lan H. Ly, David McMurray. 2020. Prokaryotic Expression, In Vitro Biological Analysis, and In Silico Structural Evaluation of Guinea Pig IL-4. **Mol Biotechnol.** **62(2):104-110.**
- Smriti Dewangan, Tulasi Barik, Rakesh Parida, Shradha Mawatwal, **Rohan Dhiman**, Santanab Giri, Saurav Chatterjee. 2019. Solvent free synthesis of ferrocene based rhodamine – hydrazone molecular probe with improved bioaccumulation for sensing and imaging applications. **J Organomet Chem.** **904:120999.**
- Abtar Mishra\*, Assirbad Behura\*, Shradha Mawatwal, Ashish Kumar, Lincoln Naik, Subhashree Subhasmita Mohanty, Debraj Manna, Puja Dokania, Amit Mishra, Samir K. Patra\*\*, **Rohan Dhiman\*\*.** 2019. Structure-function and application of plant lectins in disease biology and immunity. **Food Chem Toxicol.** **134:110827.**
- Saqib Kidwai, Rania Bouzeyen, Sohini Chakraborti, Neha Khare, Sumana Das, Tannu Priya Gosain, Assirbad Behura, Chhuttan Lal Meena, **Rohan Dhiman**, Makram Essafi, Avinash Bajaj, Deepak Saini, Narayanaswamy Srinivasan, Dinesh Mahajan and Ramandeep Singh. 2019. NU-6027 inhibits growth of *Mycobacterium tuberculosis* by targeting Protein Kinase D and Protein Kinase G. **Antimicrob Agents Chemother.** **63(9):e00996-19.**
- Assirbad Behura, Abtar Mishra, Saurabh Chugh, Shradha Mawatwal, Ashish Kumar, Debraj Manna, Amit Mishra, Ramandeep Singh, **Rohan Dhiman.** 2019. ESAT-6 modulates Calcimycin-induced autophagy through microRNA-30a in mycobacteria infected macrophages. **J Infect.** **79:139-152.**

- Nibedita Pradhan, Sabnam Parbin, Chahat Kausar, Swayamsiddha Kar, Shradha Mawatwal, Laxmidhar Das, Moonmoon Deb, Dipta Sengupta, **Rohan Dhiman**, Samir Kumar Patra. 2019. *Paederia foetida* induces anticancer activity by modulating chromatin modification enzymes and altering pro-inflammatory cytokine gene expression in human prostate cancer cells. **Food Chem Toxicol.** **130:161-173.**
- Smriti Dewangan, Sasmita Mishra, Shradha Mawatwal, **Rohan Dhiman**, Rakesh Parida, Santanab Giri, Christoph Wölper, Saurav Chatterjee. 2019. Synthesis of ferrocene tethered heteroaromatic compounds using solid supported reaction method, their cytotoxic evaluation and fluorescence behavior. **ChemistrySelect.** **4:4434-42.**
- Ribhav Mishra, Arun Upadhyay, Vijay Kumar Prajapati, **Rohan Dhiman**, Krishna Mohan Poluri, Nihar Ranjan Jana, Amit Mishra. 2019. LRSAM1 E3 ubiquitin ligase: molecular neurobiological perspectives linked with brain diseases. **Cell Mol Life Sci.** **76:2093-110.**
- Basanti Ekka, Soumitra R. Nayak, L. Satish K. Achary, Sarita, Aniket Kumar, Shradha Mawatwal, **Rohan Dhiman**, Priyabrat Dash, Raj Kishore Patel. 2018. Synthesis of hydroxyapatite-zirconia nanocomposite through sonochemical route: A potential catalyst for degradation of phenolic compounds. **J Environ Chem Eng.** **6:6504-15.**
- Smriti Dewangan, Tulasi Barik, Sasmita Mishra, Shradha Mawatwal, Supriya Kumari, Supratim Giri, Surajit Das, **Rohan Dhiman**, Christoph Wölper, Saurav Chatterjee. 2018. Half sandwich based rhodamine - hydrazone single molecule probe: Light responsive, metal sensing and imaging properties. **Appl Organometal Chem.** **32:e4612.**
- Shradha Mawatwal, Assirbad Behura, Abtar Mishra, Ramandeep Singh and **Rohan Dhiman**. 2018. Calcimycin induced IL-12 production inhibits intracellular mycobacterial growth by enhancing autophagy. **Cytokine.** **111:1-12.**
- **Rohan Dhiman** and Ramandeep Singh. 2018. Recent advances for identification of new scaffolds and drug targets for *Mycobacterium tuberculosis*. **IUBMB Life.** **70(9):905-916.**
- Padmaja Paidipally, Deepak Tripathi, Abhinav Van, Rajesh K. Radhakrishnan, **Rohan Dhiman**, Sambasivan Venkatasubramanian, Kamakshi P. Devalraju, Amy R. Tvinnereim, Vijaya L. Valluri, Ramakrishna Vankayalapati. 2018. IL-21 regulates NK cell responses during *Mycobacterium tuberculosis* infection. **J Infect Dis.** **217(8):1323-1333.**
- Shradha Mawatwal, Assirbad Behura, Abhirupa Ghosh, Saqib Kidwai, Abtar Mishra, Amar Deep, Sakshi Agarwal, Sudipto Saha, Ramandeep Singh and **Rohan Dhiman**. 2017. Calcimycin mediates mycobacterial killing by inducing intracellular calcium-regulated autophagy in a P2RX7 dependent manner. **Biochim Biophys Acta.** **1861(12):3190-3200.**
- Saqib Kidwai, Chan-Yong Park, Shradha Mawatwal, Prabhakar Tiwari, Myung Geun Jung, Tannu Priya Gosain, Pradeep Kumar, David Alland, Sandeep Kumar, Avinash Bajaj, Yun-Kyung Hwang, Chang Sik Song, **Rohan Dhiman**, Ill Young Lee and Ramandeep Singh. 2017. Dual mechanism of action of 5-Nitro-1,10-Phenanthroline against *Mycobacterium tuberculosis*. **Antimicrob Agents Chemother.** **61(11):e00969-17.**



- Sambasivan Venkatasubramanian\*, **Rohan Dhiman\***, Padmaja Paidipally, Satyanarayana S. Cheekatla, Deepak Tripathi, Elwyn Welch, Amy R. Tvinnereim, Brenda Jones, Dan Theodorescu, Peter F. Barnes, and Ramakrishna Vankayalapati. 2015. A Rho GDP dissociation inhibitor produced by apoptotic T-cells inhibits growth of *Mycobacterium tuberculosis*. ***PLoS Pathog.* 11(2): e1004617.**  
\* Equal authorship
- Zai-Xing Chen, Run-Zhen Zhao, Meimi Zhao, Xinrong Liang, Deepa Bhattarai, **Rohan Dhiman**, Sreerama Shetty, Steven Idell, Hong-Long Ji. 2014. Regulation of epithelial sodium channels in urokinase plasminogen activator deficiency. ***Am J Physiol Lung Cell Mol Physiol.* 307(8): L609-17.**
- Anuradha Bandaru, Kamakshi P. Devalraju, Padmaja Paidipally, **Rohan Dhiman**, Sambasivan Venkatasubramanian, Peter F Barnes, Ramakrishna Vankayalapati and Vijaya Lakshmi Valluri. 2014. Phosphorylated STAT3 and PD-1 regulate IL-17 production and IL-23 receptor expression in *Mycobacterium tuberculosis* infection. ***E J Immunol.* 44(7): 2013-24.**
- **Rohan Dhiman**, Sambasivan Venkatasubramanian, Padmaja Paidipally, Peter F Barnes, Amy Tvinnereim, Ramakrishna Vankayalapati. 2014. IL-22 inhibits intracellular growth of *Mycobacterium tuberculosis* by enhancing calgranulin A expression. ***J Infect Dis.* 209(4): 578-587.**
- **Rohan Dhiman**, Sivakumar Periasamy, Peter F Barnes, Ankita Garg Jaiswal, Padmaja Paidipally, Amanda B Barnes, Amy Tvinnereim, Ramakrishna Vankayalapati. 2012. NK1.1+ cells and IL-22 regulates vaccine-induced protective immunity against challenge with *Mycobacterium tuberculosis*. ***J Immunol.* 189(2): 897-905.**
- **Rohan Dhiman**, Anuradha Bandaru, Peter F Barnes, Sudipto Saha, Amy Tvinnereim, Ramesh C. Nayak, Padmaja Paidipally, Vijaya Lakshmi Valluri, L. Vijaya Mohan Rao, Ramakrishna Vankayalapati. 2011. c-Maf-dependent growth of *Mycobacterium tuberculosis* in a CD14<sup>hi</sup> subpopulation of monocyte-derived macrophages. ***J Immunol.* 186(3): 1638-1645.**
- Sivakumar Periasamy, **Rohan Dhiman**, Peter F. Barnes, Padmaja Paidipally, Anuradha Bandaru, Vijaya Lakshmi Valluri, Ramakrishna Vankayalapati. 2011. Programmed death 1 and cytokine inducible SH2-containing protein dependent expansion of regulatory T cells upon stimulation with *Mycobacterium tuberculosis*. ***J Infect Dis.* 203(9): 1256-1263.**
- **Rohan Dhiman**, Mohanalaxmi Indramohan, Peter F. Barnes, Ramesh C. Nayak, Padmaja Paidipally, L. Vijaya Mohan Rao, Ramakrishna Vankayalapati. 2009. IL-22 Produced by human NK cells inhibits growth of *Mycobacterium tuberculosis* by enhancing phagolysosome fusion. ***J Immunol.* 183(10): 6639-6645.**
- Padmaja Paidipally, Sivakumar Periasamy, Peter F. Barnes, **Rohan Dhiman**, Mohanalaxmi Indramohan, David Griffith, David Cosman, Ramakrishna Vankayalapati. 2009. NKG2D-dependent IL-17 production by Human T cells in response to an intracellular pathogen. ***J Immunol.* 183(3): 1940-1945.**

- **Rohan Dhiman**, Mahesh Kathania, Manoj Raje, Sekhar Majumdar. 2008. Inhibition of bfl-1/A1 by siRNA inhibits mycobacterial growth in THP-1 cells by enhancing phagosomal acidification. *Biochim Biophys Acta*. **1780(4): 733-742**.
- **Rohan Dhiman**, Manoj Raje, Sekhar Majumdar. 2007. Differential expression of NF- $\kappa$ B in mycobacteria infected THP-1 affects apoptosis. *Biochim Biophys Acta*. **1770(4): 649-658**.
- Loveena Rishi, **Rohan Dhiman**, Manoj Raje, Sekhar Majumdar. 2007. Nitric oxide induces apoptosis in Cutaneous T-cell lymphoma (HuT-78) by down regulating constitutive NF- $\kappa$ B. *Biochim Biophys Acta*. **1770(8): 1230-1239**.
- Manoj Raje, **Rohan Dhiman**, Sekhar Majumdar, Taposh Dass, Kanak L. Dikshit, Ramandeep Kaur. 2006. Charged Nylon membrane substrate for convenient and versatile high-resolution microscopic analysis of *E. coli* & mammalian cells in suspension. *Cytotechnology*. **51(2):111-117**.

### Book Chapters

- Abtar Mishra, Assirbad Behura, Lincoln Naik, Ashish Kumar, Puja Dokania, **Rohan Dhiman**. 2020. Mycobacterial glycoproteins: Functions and their significance in tuberculosis. p 1-28. Microbial and Natural macromolecules – synthesis and applications. Eds. Surajit Das and Hirak R. Dash. Academic Press. MA, USA.
- **Rohan Dhiman**. 2013. Natural Killer cells: Mycobacterial infection. p1492-1495. *Encyclopedia of Systems Biology*. In: Dubitzky W, Wolkenhauer O, Cho K-H, Yokota H (editors), Springer. New York, USA.
- Daizy R. Batish, R.K. Kohli, H.P. Singh, **R. Dhiman**. 2003. Tropical Hardwoods (Invited article). p 59-77. Forests and Forest Plants: Encyclopedia of Life Support systems (EOLSS) developed under the auspices of UNESCO, Eds. J.N. Owens and H.G. Lund. UNESCO's EOLSS Pub. Oxford, UK.

### Abstracts

- Abtar Mishra, Assirbad Behura, Ashish Kumar, Abhirupa Ghosh, Shradha Mawatwal, Subhashree Subhasmita Mohanty, Amit Mishra, Sudipto Saha, Sujit K. Bhutia, Ramandeep Singh, **Rohan Dhiman**. Soybean lectin-induced autophagy follows P2RX7 activated NF- $\kappa$ B-ROS pathway to kill intracellular mycobacteria. Abstract was selected for poster presentation at the 9<sup>th</sup> International Symposium on Autophagy at National Biotechnology Research Park, Taipei, Taiwan from Nov. 3-7, 2019.
- Shradha Mawatwal, Assirbad Behura, Abhirupa Ghosh, Abtar Mishra, Saqib Kidwai, Sakshi Agarwal, Sudipto Saha, Ramandeep Singh, **Rohan Dhiman**. Calcimycin induced autophagy decreases mycobacterial growth in THP-1 cells through P2RX7 dependent pathway mediated by intracellular calcium. Abstract was selected for poster presentation at the 5<sup>th</sup> Global forum on TB vaccines at Taj Diplomatic Enclave, New Delhi, India, from Feb. 20-23, 2018.
- Shradha Mawatwal, Assirbad Behura, Abhirupa Ghosh, Abtar Mishra, Saqib Kidwai, Sudipto Saha, Ramandeep Singh, **Rohan Dhiman**. Calcimycin mediates mycobacterial killing by

inducing intracellular calcium-regulated autophagy in a P2RX7 dependent manner. Abstract was selected for poster presentation at the India-EMBO conference “Autophagy: Cellular mechanism(s) and significance in health and disease” at ILS, Bhubaneswar, India, from Dec. 11-13, 2017.

- Shradha Mawatwal, Saqib Kidwai, Arnab Kapuria, Amardeep Singh, Sakshi Agarwal, Ramandeep Singh, **Rohan Dhiman**. Calcimycin inhibits intracellular mycobacterial growth by regulating autophagy. Abstract was selected for poster presentation at the EMBO conference Tuberculosis 2016 “Interdisciplinary research on tuberculosis and pathogenic mycobacteria” at Institute Pasteur, Paris, France, from Sept. 19-23, 2016.
- **Rohan Dhiman**, Sambasivan Venkatasubramanian, Padmaja Paidipally, Satyanarayana S. Cheekatla, Deepak Tripathi, Elwyn Welch, Amy R. Tvinnereim, Brenda Jones, Dan Theodorescu, Peter F. Barnes and Ramakrishna Vankayalapati. A Rho GDP Dissociation Inhibitor Produced by Apoptotic T-Cells Inhibits growth of *Mycobacterium tuberculosis*. Abstract was selected for poster presentation at the 8<sup>th</sup> Young Investigator’s Meeting at Gurgaon, Haryana from Feb. 27- March 2, 2016.
- **Rohan Dhiman**, Padmaja Paidipally, Sambasivan Venkatasubramanian, Amy Tvinnereim, Susan T. Howard, Peter F. Barnes, Ramakrishna Vankayalapati. A subpopulation of CD4+CD25+Foxp3+ T-cells inhibits growth of *Mycobacterium tuberculosis*. Abstract was selected for short presentation and poster at the TB Keystone symposium “Host response in Tuberculosis” at Whistler, Canada, from March 13-18, 2013.
- **Rohan Dhiman**, Padmaja Paidipally, Peter F. Barnes, Amy Tvinnereim, Ramakrishna Vankayalapati. IL-22 enhances Calgranulin A expression by human macrophages to inhibit virulent *Mycobacterium tuberculosis* growth. Abstract was selected for poster presentation at the 5<sup>th</sup> Young Investigator’s Meeting at Jodhpur, Rajasthan from Feb. 10-14, 2013.
- **Rohan Dhiman**, Padmaja Paidipally, Peter F. Barnes, Amy Tvinnereim, Ramakrishna Vankayalapati. IL-22 enhances Calgranulin A expression by human macrophages to inhibit virulent *Mycobacterium tuberculosis* growth. Abstract selected for poster presentation at the 98<sup>th</sup> annual meeting of American Association of Immunologists at San Francisco, CA from May 13-17, 2011.
- **Rohan Dhiman**, Anuradha Bandaru, Peter F. Barnes, Sudipto Saha, Amy Tvinnereim, Ramesh C. Nayak, Padmaja Paidipally, Vijaya Lakshmi Valluri, L. Vijaya Mohan Rao, Ramakrishna Vankayalapati. c-MAF dependent growth of *Mycobacterium tuberculosis* in a CD14<sup>hi</sup> subpopulation of monocytes-derived macrophages. Abstract selected for poster presentation at the Texas Tuberculosis Research Symposium 2011 at University of Texas Medical Branch, Galveston, TX on April 11, 2011.
- **Rohan Dhiman**, Anuradha Bandaru, Sudipto Saha, Peter F. Barnes, Amy Tvinnereim, Padmaja Paidipally, Vijaya Lakshmi Valluri, Ramakrishna Vankayalapati. Monocyte heterogeneity and c-MAF dependent *Mycobacterium tuberculosis* growth in human *M. tuberculosis*-infection. Abstract selected for poster presentation at the 2010 meeting on Gene expression and signaling in the immune system at Cold Spring Harbor Laboratory Cold Spring Harbor, New York from April 21-25, 2010.

- **Rohan Dhiman**, Indramohan Mohanalaxmi, Peter F. Barnes, Padmaja Paidipally, Ramakrishna Vankayalapati. IL-15 and DAP10 mediated IL-22 production by Natural killer cells in human *Mycobacterium tuberculosis*-infection. Abstract selected for poster presentation at The 96<sup>th</sup> annual meeting of American Association of Immunologists at Seattle, WA from May 8-12, 2009.
- Mahesh Kathania, **Rohan Dhiman**, Manoj Raje, Sekhar Majumdar. Bfl-1/A1 acts as a negative regulator of autophagy in mycobacteria infected macrophages. Abstract selected for poster presentation at International Symposium on Emerging Trends in Tuberculosis Research: Biomarkers, Drugs and Vaccines at International Centre for Genetic Engineering and Biotechnology, New Delhi from Dec. 1-3, 2008.
- **Rohan Dhiman**, Manoj Raje, Sekhar Majumdar. Differential expression of NF- $\kappa$ B in Human monocytic leukemic cell line THP-1 determines the apoptotic fate of mycobacteria infected cells. Abstract selected for poster presentation at International symposium on New Frontiers in Tuberculosis Research at International Centre for Genetic Engineering and Biotechnology, New Delhi from Dec. 4-6, 2006.

### Techniques Expertise:

#### Microbiology:

Experience of working and handling virulent mycobacteria (*M. tuberculosis* H37Rv) in BSL-3, culture and maintenance of *M. tuberculosis* H37Rv, *M. tuberculosis* H37Ra, *M. smegmatis*, *M. bovis* BCG and *M. microti* in broth base (7H9 Broth), agar base (7H10 Agar with or without OADC or ADC) and on Lowenstein-Jensen slants, preparation of different fractions (cell wall, membrane, cytosol) of mycobacteria.

#### Nucleic acids:

Gene cloning in *E. coli* and mycobacteria, Isolation and purification of plasmid, DNA and RNA, Southern Hybridization, Klenow filling, 5'-End labeling of DNA, Random priming of DNA, PCR amplification, Restriction digestion, etc.

#### Tissue culture and Mouse handling experience:

Maintenance of different mammalian cell lines (THP-1, HuT-78, JM-1, J774A.1, Jurkat, COS-7, N2A, NS, CHO, RAW264.7 etc.), transfection with plasmid DNA (both stable and transient using Calcium phosphate, DEAE-Dextran, Retroviral and electroporation), isolation of genomic DNA, experience of handling BALB/c for isolation of peritoneal macrophages, intravenous and sub-cutaneous injections to mice, isolations of lungs, spleen and lymph nodes from mice, Ficoll separation of various cell population from Human blood,

#### Proteins:

Analysis of proteins on SDS-PAGE, Coomassie and silver staining, *in-vitro* transcription and translation, Western blotting for cytosolic and membrane proteins, Analysis of secretory proteins by TCA precipitation.

#### Others:

EMSA (Electrophoretic mobility shift assay), Flow cytometric analysis of cells (TUNEL, Propidium Iodide staining, Annexin V staining, JC-1 staining, surface and intracellular staining for various molecules), Confocal microscopy (partial), Magnetic Cell Sorter Separation of different cell populations from human blood, DNA fragmentation analysis, Fluorescence microscopic analysis of cells (DAPI staining), reporter gene assay (using SEAP or Luciferase), RNase protection assay (RPA), ELISA, ELISPOT, Reverse Transcriptase-PCR, Real Time RT-PCR, Spectrophotometric analysis using Bradford reagent (for measuring proteins) and Griess reagent (for measuring nitric oxide), Measurement of Reactive oxygen intermediates by flow cytometer, Phagosome-lysosome fusion studies, siRNA transfection studies, immunofluorescence, cell viability assays (MTT or neutral red or PI staining).

**Referees:**

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