

**Personal Details:**

**Name:** Arun Kumar Haldar  
**Date of Birth:** 2<sup>nd</sup> November 1977  
**Place of Birth:** Gabberia, WB, India  
**Nationality:** Indian

**CURRENT POSITION AND CONTACT:**

**DBT-Ramalingaswami Fellow (~ Scientist-D) and AcSIR Assistant Professor,**  
**Division of Biochemistry and Structural Biology, CSIR- CDRI,**  
 Sector -10, Sitapur Road, Jankipuram Extn. Lucknow - 226031, UP, India  
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**Area of Research Interests:**

Cell Biology / Immunology / Infectious Diseases / Drug-resistance / Host Pathogen Interactions / Biochemistry / Cell Signaling / Molecular Biology.

**Education:**

- 2009 **Ph.D. in Cell Biology and Immunology** under the supervision of **Dr. Syamal Roy**, Department of Infectious Diseases and Immunology, CSIR-Indian Institute of Chemical Biology, affiliated with Jadavpur University, Kolkata, India.
- 2002 **M.Sc. in Chemistry (Organic Special)**, University College of Science and Technology, Calcutta University, Kolkata, India. **First Class.**
- 1999 **B.Sc. in Chemistry (Hons)**, Maulana Azad College, Calcutta University, Kolkata, India. **First Class.**

**Professional Experiences (~ 13 years):**

- Aug, 2017 – Present **DBT-Ramalingaswami Fellow (~ Scientist-D) and AcSIR Assistant Professor**, Division of Biochemistry and Structural Biology, **CSIR-Central Drug Research Institute**, Lucknow, Uttar Pradesh, India.
- Feb, 2016 – July 2017 Research Scientist (scholar) in the laboratory of **Dr. Joern Coers**, **DUMC**, Department of Molecular Genetics and Microbiology, Durham, NC, USA.
- Feb, 2011 – Jan, 2016 Postdoctoral Research Associate in the laboratory of **Dr. Joern Coers**, **Duke University Medical Center (DUMC)**, Department of Molecular Genetics and Microbiology, Durham, NC, USA.
- April 2009 – Jan, 2011 Postdoctoral fellow in the laboratory of **Dr. Syamal Roy**, **Indian Institute of Chemical Biology**, Department of Infectious Diseases and Immunology, Kolkata, India.

**Teaching Experiences:**

- 2002 – 2003 Lecturer (Part-time), Sundarban Mahavidyalaya (CU), Chemistry for under-graduate students.
- Since 2021 PhD graduate teaching on Biochemistry, Chemical Biology (1 semester / year).

My teaching expertise include: Biochemistry, more advanced courses in Host-pathogen interactions, Cell Biology and Immunology, Molecular Biology, Infectious disease biology, DNA technology.

**Supervision of Master/Ph. D. theses:**

No. of Students	Degree	PI / Co-PI	Ongoing	Awarded
4	M. Sc. (Biotechnology)	PI	1	3
1	Ph. D.	Co-PI	1	--

**Sponsored Project: DBT-Ramalingaswami Fellowship Grant**

Role in Project	Funding Agency	Period		Research grant (Rs. in lakh)	Status
		From	To		
<b>PI</b>	<b>DBT-India</b>	<b>09-08-2017</b>	<b>08-08-2022</b>	<b>102.135 Lakhs (including Fellowship)</b>	<b>Ongoing</b>

**Scholastic Achievements/Awards:**

- 2002      Awarded for **Lectureship** for qualifying National Eligibility Test (CSIR-UGC/NET) held by Council of Scientific and Industrial Research (CSIR), India.
- 2003      Awarded for **CSIR-JRF** for qualifying CSIR-UGC/NET held by Council of Scientific and Industrial Research (CSIR), India.
- 2005      Awarded for **CSIR-SRF** by Council of Scientific and Industrial Research (CSIR), India.
- 2009      **CSIR-Extended SRF** from Council of Scientific and Industrial Research (CSIR), India.
- 2010      **CSIR-Research Associate Fellowship** from Council of Scientific and Industrial Research (CSIR), India.
- 2013      Recipient of **MGM Distinguished Fellows Travel Awards**, from Duke University Medical Center, Durham, NC, USA.
- 2015      Recipient of **MGM Chairman's Travel Awards (2015 Meritorious Research Travel Award)**, from Duke University Medical Center, Durham, NC, USA.
- 2016**      Selected for **Ramalingaswami Fellowship**, Department of Biotechnology (DBT), Ministry of Science & Technology, Government of India.
- 2020      CSIR-CDRI Incentive Award: For High Impact factor publication in 2020, CSIR-Central Drug Research Institute, Lucknow, India

**Memberships in Professional Societies:**

- 1) 2013 – till date: Member of Chlamydia Basic Research Society (CBRS).
- 2) 2020 – till date: Member of American Society for Microbiology (ASM).

**Invited Reviewer of the Journals:**

1. Pathogens and Disease
2. Asian Pacific Journal of Tropical Medicine

**Research Experiences:****Ph.D. (Graduate Research):**

Laboratory of Dr. Syamal Roy, Indian Institute of Chemical Biology, Kolkata, India; September 2003 – March 2009.

- Set out to define the cellular and molecular basis of immunoregulation of selective natural and synthetic compounds in Experimental Visceral Leishmaniasis.
- Investigated the molecular basis of Sodium Antimony Gluconate (SAG) mediated activation and maturation of dendritic cells (DCs) and the impact of its regulation by SAG-resistant-*Ld* in the development of resistance to antimonial drugs in *Ld*.
- Examined the antileishmanial efficacy of six mono- and di-nuclear peroxovanadium compounds both *in vitro* and *in vivo*. Demonstrated that drug diperoxovanadate features antileishmanial properties and can be used as an adjunct therapy alongside otherwise ineffective administration of SAG to successfully treat antimony-resistant cases in visceral leishmaniasis.

**Job Responsibilities:** Lab research, experimental planning, scientific writing, guiding of master and graduate students' research projects.

**Postdoctoral Research:**

Laboratory of Dr. Syamal Roy, Indian Institute of Chemical Biology, Kolkata, India; April 2009 – January 2011.

- Studied the immunomodulatory effect and the mode of action of mononuclear diperoxovanadium compounds during *Leishmania* infection.
- Monitored differential gene expressions in SAG-sensitive and –resistant clinical isolates of *Leishmania donovani* through qPCR applications.

**Job Responsibilities:** Lab research, experimental planning, scientific writing, guiding of master and graduate students' research projects.

Laboratory of Dr. Jörn Coers, Duke University Medical Center, Durham, NC, USA; February 2011 to July 2017:

- Spearheaded a research project addressing how intracellular microbicidal effector proteins discriminate between endomembranous structures (“self”) and “non-self” pathogen-containing vacuoles (PVs) as their targets.
- Developed a new framework for understanding how the mammalian immune system detects and targets PVs which contain bacterial pathogen *Chlamydia spp.* and protozoa parasite *Toxoplasma gondii*.
- Investigated how the cellular housekeeping process called autophagy promotes the activity of a family of IFN $\gamma$ -inducible, antimicrobial GTPases.
- Identified ubiquitin and ubiquitin-binding proteins as critical host factors for the recruitment of IFN $\gamma$ -inducible, antimicrobial GTPases to PVs.

**Job Responsibilities:** Lab research, experimental planning, scientific writing, guiding of undergraduate and graduate students' research projects.

**Ongoing Independent Research as a DBT-Ramalingaswami Fellow at CSIR-CDRI, Lucknow from August 2017 to present:**

My current lab research is focused on

- To elucidate the molecular mechanism how the interferon (IFN)-inducible GTPases Guanylate Binding Proteins (GBPs), without targeting to the *Leishmania* containing vacuoles, could activate the host autophagy machinery to restrict *Leishmania donovani* growth.
- Identification and characterization of novel cell autonomous host-defense pathways active against intravacuolar pathogens (e.g., *Chlamydia spp.*, *Mycobacterium spp.*, *Toxoplasma gondii*, *Leishmania spp.*).
- Characterization of E3-Ubiquitin ligases (found to be differentially regulated in mouse and human cells during infection with the aforesaid intravacuolar pathogens) as the host resistant factors against these pathogens.
- Searching for new antimicrobial drug targets by understanding the pathogen evasion strategies of host ubiquitin immune recognition and by the identification of novel microbial virulence factors.

**Job Responsibilities:** Supervision of projects, lab research, experimental planning, scientific writing, mentoring master students and PhD students registered with my collaborators at CDRI.

**Research Publications:**

1. Haldar A. K.\* **2021**. Guanylate Binding Proteins promote anti-*Leishmania* Host Cell Defense *Journal of Cellular Immunology* 2021; 3(5): 321-325 (Commentary). \* **Corresponding Author**
2. Finethy R., Dockerman J., Kutsch M., Orench-Rivera N., Wallace G, Piro A. S., Luoma S., Haldar A. K., Hwang S., Martinez J., Kuehn M. J., Taylor G. A., Coers J. **2020**. Dynamin-related Irgm proteins modulate LPS-induced caspase-4 activation and septic shock. *EMBO Reports* 5;21(11):e50830. **Impact Factor – 8.8**

3. **Haldar A. K.\***, Nigam U., Yamamoto M., Coers J. and Goyal N. **2020**. Guanylate binding proteins restrict *Leishmania donovani* growth in non-phagocytic cells independent of parasitophorous vacuolar targeting. [\*mBio\*](#) vol. 11(4). e01464-20. <https://doi.org/10.1128/mBio.01464-20>. **Impact Factor – 7.86**  
\* **Corresponding Author**
4. Majumdar T., Sharma S., Kumar M., Hussain Md. A., Chauhan N., Kalia I, Sahu A. K., Rana V. S., Bharti R., **Haldar A. K.**, Singh A. P., Mazumder S. **2019**. Tryptophan-kynurenine pathway attenuates  $\beta$ -catenin-dependent pro-parasitic role of STING-TICAM2-IRF3-IDO1 signalosome in *Toxoplasma gondii* infection. [\*Cell Death & Disease\*](#); 10(3):161. DOI: <https://doi.org/10.1038/s41419-019-1420-9>, **Impact Factor – 8.46**
5. Finethy R., Luoma S., Orench-Rivera. N., Feely E. M., **Haldar A. K.**, Yamamoto M., Kanneganti T-D., Kuehn M. J., and Coers J. **2017**. *In vivo* inflammasome activation by lipopolysaccharide or bacterial outer membrane vesicles requires guanylate binding proteins. [\*mBio\*](#) vol. 8 no. 5 e01188-17; doi: 10.1128/mBio.01188-17. **Impact Factor – 7.86**
6. **Haldar, A. K.**, Piro A. S., Finethy R., Espenschied S., Brown H., Giebel A., Frickel E. M., Nelson D., Coers, J. **2016**. *Chlamydia trachomatis* is resistant to IFN $\gamma$ -induced inclusion ubiquitination and associated cell-autonomous immunity in human epithelial cells. [\*mBio\*](#) vol. 7 no. 6 e01417-16; doi: 10.1128/mBio.01417-16. **Impact Factor – 7.86**
7. Coers J, **Haldar A. K.** **2015**. Ubiquitination of pathogen-containing vacuoles promotes host defense to *Chlamydia trachomatis* and *Toxoplasma gondii*. [\*Communicative & Integrative Biology\*](#). 8(6):e1115163. doi: 10.1080/19420889.2015.1115163. **Impact Factor – 2.3**
8. **Haldar, A. K.**, Foltz, C., Finethy, R., Piro, A. S., Feeley, E. M., Pilla, D., Komatsu, M., Frickel, E. M., Coers, J. **2015**. Ubiquitin systems mark pathogen-containing vacuoles as targets for host defense by Guanylate Binding Proteins. [\*Proceedings of the National Academy of Sciences\*](#). 112(41);E5628–E5637, doi: 10.1073/pnas.151596611. **Impact Factor – 11.25**
9. Finethy, R., Jorgensen, I., **Haldar A. K.**, de Zoete, M., Strowing, T., Flavell, R., Yamamoto, M., Nagarajan, U., Miao, E. and Coers, J. **2015**. Guanylate Binding Proteins enable rapid activation of canonical and noncanonical inflammasomes in *Chlamydia*-infected macrophages. [\*Infection and Immunity\*](#); 83:4740–4749. doi:10.1128/IAI.00856-15. **Impact Factor – 3.44**
10. **Haldar A. K.**, Piro A. S., Pilla D. M., Yamamoto M and Coers J. **2014**. The E2-like conjugation enzyme Atg3 promotes binding of IRG and GBP proteins to *Chlamydia*- and *Toxoplasma*-containing vacuoles and host resistance. [\*PLoS One\*](#) 9(1): e86684. doi:10.1371/journal.pone.0086684. **Impact Factor – 3.24**
11. Pilla D. M., Hagar J. A., **Haldar A. K.**, Mason A. K., Ernst R. K., Yamamoto M., Miao E. A., and Coers J. **2014**. Gbp proteins promote caspase-11-dependent pyroptosis in response to cytoplasmic LPS. [\*Proceedings of the National Academy of Sciences\*](#) 111(16):6046-51 doi:10.1073/pnas.1321700111. **Impact Factor – 11.25**
12. **Haldar A. K.**, Saka H. A., Piro A. S., Dunn J. D., Henry S. C., Taylor G. A., Frickel E. M., Valdivia R. H. and Coers J. **2013**. IRG and GBP host resistance factors target aberrant, "non-self" vacuoles characterized by the missing of "self" IRGM proteins. [\*PLoS Pathogens\*](#) 06/2013; 9(6):e1003414. **Impact Factor – 6.82**
13. Datta S., Adak R., Chakraborty P., **Haldar A. K.**, Bhattacharjee S., Chakraborty A., Roy S., Manna M.. 2012. Radio-attenuated leishmanial parasites as immunoprophylactic agent against experimental murine visceral leishmaniasis. [\*Experimental Parasitology\*](#). **2012** Jan;130(1):39-47. **Impact Factor – 2.01**
14. **Haldar A. K.**, Sen P. and Roy S. **2011**. Use of Antimony in the Treatment of Leishmaniasis: Current Status and Future Directions. [\*Molecular Biology International\*](#) doi:10.4061/2011/571242. **Impact Factor – 2.39**
15. **Haldar A. K.**<sup>#</sup>, Yadav V<sup>#</sup>, Singhal E., Bisht K. K., Singh A., Bhaumik S., Basu R., Sen P., and Roy S. **2010**. *Leishmania donovani* Isolates with Antimony-Resistant but not –Sensitive Phenotype Inhibit Sodium Antimony Gluconate Induced Dendritic Cell Activation. [\*PloS Pathogens\*](#) May 20;6(5):e1000907. **Impact Factor – 6.82**; <sup>#</sup> Equal contribution.
16. **Haldar A. K.**, Bannerjee S., Naskar K., Kalita D., Islam N. S., and Roy S. **2009**. Sub-optimal Dose of Sodium Antimony Gluconate (SAG)-Diperoxovanadate Combination Clears Organ Parasites from

- BALB/c Mice Infected with Antimony Resistant *Leishmania donovani* by Expanding Antileishmanial T-cell Repertoire and Increasing IFN- $\gamma$  to IL-10 Ratio. [c](#) 122:145–154. **Impact Factor – 2.01**
17. Banerjee, S., Ghosh J., Sen S., Guha R., Dhar R., Ghosh M., Datta S., Raychaudhury B., Naskar K., **Haldar A. K.**, Lal C. S., Pandey K., Das V. N. R., Das P., and Roy S. **2009**. Designing Therapies against Experimental Visceral Leishmaniasis by Modulating the Membrane Fluidity of Antigen-Presenting Cells. [Infection and Immunity](#), 77(6): 2330-42. **Impact Factor – 3.44**
  18. Bhattacharyya N., Pal A., Patra S., **Haldar A. K.**, Roy S., and Ray M. **2008**. Activation of Macrophages and lymphocytes by methylglyoxal against tumor cells in the host. [International Immunopharmacology](#), 8(11): 1503-1512. **Impact Factor – 4.93**
  19. Basu, R., Bhaumik, S., **Haldar A. K.**, Naskar K., De T., Dana S. K., Walden P., and Roy S. **2007**. Hybrid cell vaccination resolves *Leishmania donovani* infection by eliciting strong CD8+CTL response with concomitant suppression of IL-10 but not IL-4 and IL-13. [Infection and Immunity](#), 75:5956-5966. **Impact Factor – 3.44**

### Conferences / Symposia / International Scientific Meetings:

- 1) Poster presentation entitled “Developing mouse models of chronic Chlamydia trachomatis infections”. Zhe Shi, Anthony S. Piro, Andrew J. Olive, **Arun K. Haldar**, Michael N. Starnbach and Jörn Coers; at 6th biennial meeting for Chlamydia Basic Research Society (CBRS). March 19-22, 2013; San Antonio, Texas, USA.
- 2) Oral presentation entitled “Immune targeting of IFN $\gamma$ -inducible IRG and GBP GTPases to *Chlamydia trachomatis* inclusions through intracellular “missing-self” recognition”. **Arun K. Haldar**, Hector A. Saka, Anthony S. Piro, Joe D. Dunn, Stanley C. Henry, Gregory A. Taylor, Eva M. Frickel, Raphael H. Valdivia and Jörn Coers at 6th biennial meeting for Chlamydia Basic Research Society (CBRS). March 19-22, 2013; San Antonio, Texas, USA.
- 3) Poster presentation entitled “The E3 ubiquitin ligase TRAF6 and the ubiquitin-binding protein p62 regulate the recruitment of Guanylate Binding Proteins to pathogen-containing vacuoles”. **Arun K. Haldar**, Clèmence Foltz, Ryan Finethy, Anthony S. Piro, Eric M. Feeley, Danielle M. Pilla, Eva M. Frickel, and Jörn Coers; at Duke Innate Immunity Group (DIIG) one-day Symposium on Innate Immunity and Inflammation. 5<sup>th</sup> May 2015; Duke University Medical Center, Durham, NC, USA.
- 4) Poster presentation entitled “The E3 ubiquitin ligase TRAF6 and the ubiquitin-binding protein p62 regulate the recruitment of Guanylate Binding Proteins to pathogen-containing vacuoles”. **Arun K. Haldar**, Clèmence Foltz, Ryan Finethy, Anthony S. Piro, Eric M. Feeley, Danielle M. Pilla, Eva M. Frickel, and Jörn Coers; at FASEB conference on Molecular Pathogenesis: Mechanisms of Infectious Disease. July 12-17, 2015, Keystone, Colorado, USA.
- 5) Poster presentation entitled “Guanylate Binding Proteins enable rapid activation of canonical and noncanonical inflammasomes in Chlamydia-infected macrophages”. Ryan Finethy, Ine Jorgensen, **Arun K. Haldar**, Marcel R. de Zoete, Richard A. Flavell, Masahiro Yamamoto, Uma M Nagarajan, Edward A. Miao, and Jörn Coers; at FASEB conference on Molecular Pathogenesis: Mechanisms of Infectious Disease. July 12-17, 2015, Keystone, Colorado, USA.
- 6) Poster presentation entitled “*Chlamydia trachomatis* is resistant to IFN $\gamma$ -inducible host defense that delivers ubiquitin to inclusions in human cells”. **Arun K. Haldar**, Ryan. Finethy, Anthony S. Piro, and Jörn Coers. Duke Innate Immunity Group (DIIG) one-day Symposium on Innate Immunity and Inflammation. 10<sup>th</sup> June 2016; Duke University Medical Center, Durham, NC, USA.
- 7) Poster presentation entitled “*Chlamydia trachomatis* Is Resistant to Inclusion Ubiquitination and Associated Host Defense in Interferon Gamma-Primed Human Epithelial Cells”. **Arun K. Haldar**, Anthony S. Piro, Ryan. Finethy, S. T. Espenschied, Hanna E. Brown, A. M. Giebel, Eva M. Frickel, David E. Nelson and Jörn Coers at 8th biennial meeting for Chlamydia Basic Research Society (CBRS). April 7-10; 2017, Charlotte, NC, USA.
- 8) Attended 7<sup>th</sup> International Symposium on “Current Trends in Drug Discovery Research” held on February 20-23, 2019, at CSIR-Central Drug Research Institute, Lucknow, UP, India.
- 9) Attended 8<sup>th</sup> International Symposium on “Current Trends in Drug Discovery Research” held on March



12-14, 2022, at CSIR-Central Drug Research Institute, Lucknow, UP, India.

#### Invited Talks:

- 1) Delivered a Research Seminar on “The Molecular “Kiss of Death”: Finding the Enemy Within—How Cells Recognize and Respond to a Microbial Pathogen Hidden in a Vacuole” on 4<sup>th</sup> March 2016 at CSIR-Indian Institute of Chemical Biology, Kolkata, WB, India.
- 2) Delivered a Seminar on “The Molecular “Kiss of Death”: Finding the Enemy Within—How Cells Recognize and Respond to a Microbial Pathogen Hidden in a Vacuole” on 18<sup>th</sup> March 2016 at School of Biological Sciences, National Institute of Science Education and Research (NISER), Odisha, India.

#### REFERENCES:

<p><b>1. SYAMAL ROY, Ph.D.</b> (Ph.D. Supervisor) ICMR Emeritus Scientist, CSIR-Indian Institute of Chemical Biology, Kolkata – 700032 <b>E-mail ID:</b> <a href="mailto:drsyalmalroy@yahoo.com">drsyalmalroy@yahoo.com</a> Mobile No.: +91-9874532967</p>	<p><b>4. NEENA GOYAL, Ph.D.,</b> Ex-Professor (AcSIR) &amp; Chief Scientist, Head of the Division of Biochemistry, CSIR-Central Drug Research Institute, Sector-10, Jankipuram Ext., Lucknow-226031(UP) India, Email ID: <a href="mailto:neenacdri@yahoo.com">neenacdri@yahoo.com</a> Mob:+91-9415109175</p>
<p><b>2. JOERN COERS, Ph.D.</b> (Postdoctoral Advisor), Associate Professor Duke University Medical Center, Dept. of Molecular Genetics and Microbiology, Box 3580 DUMC, 419 and 230 JONES, Research Drive, Durham, NC, USA 27710 E-mail ID: <a href="mailto:jorn.coers@duke.edu">jorn.coers@duke.edu</a> Phone: 001-9196847109; Fax: 001-919-684-2790</p>	<p><b>5. KISHORE KUMAR SRIVASTAVA, Ph.D.,</b> Honorary Scientist, Former Head and Chairperson, Division of Microbiology / Ex-Chief Scientist, CSIR- Central Drug Research Institute, Sector-10, Jankipuram Ext., Lucknow-226031(UP) India, Email ID: <a href="mailto:kishorecdri@yahoo.com">kishorecdri@yahoo.com</a> / <a href="mailto:kishore@cdri.res.in">kishore@cdri.res.in</a> Mob:+91-9415587451</p>
<p><b>3. TAPAS KUMAR KUNDU, Ph.D.</b> Ex-Director (CSIR-CDRI, Lucknow), <b>Professor</b> Jawaharlal Nehru Centre for Advanced Scientific Research, Rachenahalli Lake Rd, Jakkur, Bengaluru, Karnataka-560064 Email ID: <a href="mailto:tapas@incasr.ac.in">tapas@incasr.ac.in</a> / <a href="mailto:tapas.jnc@gmail.com">tapas.jnc@gmail.com</a> Mobile No.: +91-9449456334</p>	

#### DECLARATION

I hereby declare that the information furnished above is true to the best of my knowledge and belief.

Date: 15 / 03 / 2022  
Place: Lucknow, UP, India.



ARUN KUMAR HALDAR