

Manmeet Singh

Affiliated to:

Doctor of Philosophy program
Department of Biological Sciences
Indian Institute of Science Education and
Research Kolkata
Nadia, 741246, West Bengal, India

Email: manmeet0590@gmail.com
ms13rs039@iiserkol.ac.in
Phone: +918708267154

Date of Birth: January 5, 1990

Nationality: Indian

Research experiences

1. Ph.D.

Under the supervision of Professor Jayasri Das Sarma
Neurovirology and Neuroimmunology lab, Indian Institute of Science Education and
Research Kolkata, India (Dec. 26, 2013 to Sept. 2, 2019)

Project and Thesis Title: “A proline insertion-deletion in the core of fusion peptide of mouse hepatitis virus spike glycoprotein alters structural rigidity and modulates neuropathogenesis”.

Other Projects:

- a. Role of fusion peptide of mouse hepatitis virus in axonal transport.
- b. Effect of arsenic-induced toxicity on DJ1, a stress response gene.

Other research experiences:

A. Du Pre award 2015, Multiple Sclerosis International Federation, UK

Perelman School of Medicine, University of Pennsylvania (Aug-Sept, 2016)

Principal investigator: Dr. Kenneth S. Shindler, Associate professor, University of Pennsylvania.

Project: Intracranial inoculation is more potent than intranasal inoculation for inducing optic neuritis in the mouse hepatitis virus-induced model of multiple sclerosis.

B. Master's thesis project:

Kumaun University, Nainital. Supervisor: Dr. Sushma Tamta (Jan-Jun, 2013)

Project Title: Biochemical analysis and elucidation of lipid productivity of selected microalgal species isolated from Domestic wastewater for biofuel potential.

Publications:

a. Research Articles:

1. **Manmeet Singh**, Abhinoy Kishore, Dibyajyoti Maity, Punnepali Sunanda,.....Jayasri Das Sarma, (2019). A proline insertion-deletion in the spike glycoprotein fusion peptide of mouse hepatitis virus strongly alters neuropathology. *Journal of Biological Chemistry*. doi: 10.1074/jbc.RA118.004418
2. **Manmeet Singh**, Reas S. Khan, Kimberly Dine, Jayasri Das Sarma and Kenneth S. Shindler (2018). Intracranial Inoculation Is More Potent Than Intranasal Inoculation for Inducing Optic Neuritis in the Mouse Hepatitis Virus-Induced Model of Multiple Sclerosis. *Frontiers in Cellular and Infection Microbiology*. <https://doi.org/10.3389/fcimb.2018.00311>
3. Jibin Sadasivan, **Manmeet Singh** and Jayasri Das Sarma (2017). Cytoplasmic tail of coronavirus spike protein has intracellular targeting signals. *Journal of Biosciences*. Volume 42 (2), page 231-44.
4. Saurav Saswat Rout#, **Manmeet Singh** , Kenneth S. Shindler and Jayasri Das Sarma.(#Equal contribution) "One proline deletion in the fusion peptide of neurotropic mouse hepatitis virus (MHV) restricts retrograde axonal transport and neurodegeneration". *Journal of Biological Chemistry J. Biol. Chem.* (2020) 295(??) 1–xxx

b. Book chapter:

Manmeet Singh and Jayasri Das Sarma (2016). Demyelinating disease and Neuroinflammation. *Springer Science*. DOI 10.1007/978-981-10-1711-7_5

Awards and honors:

2016-present	Senior Research Fellowship (SRF), University Grant Commission, India
2014-2016	Junior Research Fellowship (JRF), University Grant Commission, India
2018	Travel award to attend the 34 th congress of European committee for treatment and research in Multiple sclerosis (ECTRIMS-2018), Berlin, Germany.
2017	XXXV Annual Meet of Indian Academy of Neurosciences (IAN 2017) Department of Zoology, School of Life Sciences, Ravenshaw University, Cuttack, Odisha, India
2016	Prof. Don Gilden Memorial Award for the best poster in an International Indo US Symposium on Central Nervous System viral infection and its Therapy 2016, India
2015	Best poster award in Frontiers in Modern Biology 2015, organized by Department of Biological Sciences IISER Kolkata
2015	DuPre fellowship 2015, by Multiple Sclerosis International Federation society, UK

Conference/workshop attended and poster presented

1. Presented Ph.D. research topic seminar at Laboratory of Virology, National Institute of Allergy and Infectious Disease (NIAID), National Institute of Health, Hamilton, Montana.
2. Presented a poster in “34th Congress of European committee for treatment and research in Multiple Sclerosis (ECTRIMS)” Berlin, Germany, 2018.
3. Presented poster in “XXXV Annual Meet of Indian Academy of Neurosciences (IAN 2017) and International Conference on Translational Neurosciences and its Application in Protection of Mental Health” organized by Department of Zoology, School of Life Sciences, Ravenshaw University, Cuttack, Odisha (India) from 29 to 31 of October, 2017.
4. Participated in 10th year Celebration of Excellence in Science at IISER Kolkata “Advances in Life Sciences” held on January 13-15, 2017.
5. Delivered a Platform talk and won Prof. Don Gilden Memorial Award in an international “Indo-US Symposium on Central Nervous System viral infection and its Therapy 2016” jointly organized by University of IOWA, USA, IISER Kolkata and BHU, India from November 14-17, 2016.
6. Won Best poster award in “Frontiers in Modern Biology 2015”, organized by Department of Biological Sciences IISER Kolkata from December 5-6, 2015.
7. Attended the three day workshop on “Advanced Microscopy and Imaging Technique” jointly organized by DSS image Pvt. Limited, Olympus Medical System India Pvt. Ltd. And Photometrics (USA) and IISER Kolkata from Dec.16-18 , 2014.
8. Participated in National training on “Structure and Sequence Bioinformatics” held on March 22-23, 2012 organized by Department of Biotechnology, K.U. Nainital, sponsored by DBT, Ministry of Science and Technology, Government of India, New Delhi.
9. DBT sponsored program on “Computational Biology and its Application” 15-16, March 2013.
10. Participated in “National Science Day” held on 28th February 2012 organized by Department of Biotechnology, K.U. Nainital, sponsored by DBT, Govt. of India and UCOST, Govt. Of Uttarakhand.
11. Assisted in “2nd State level Science and Technology Youth Festival 2013”.

Other academic qualifications:

2014 (January to May 2014)	Ph.D. course work program, Department of Biological Sciences, Indian Institute of Science Education and Research Kolkata (IISER K) (CGPA- 9.33)
2011-2013	Master’s degree in Biotechnology, Department of Biotechnology, Kumaun University, Nainital (Percentage: 83.6)
2007-2010	Bachelor’s Degree in Life Sciences S.D. (PG) College, Panipat(Affiliated to Kurukshetra University) (Percentage: 81.16)

National level Examinations:

2013: National Eligibility Test, CSIR-UGC, India. Rank: 67

2013: Graduate Aptitude Test for Engineering (GATE), India.

2013: National level examination DBT-JRF conducted by Department of Biotechnology, Government of India.

Teaching experience

2018 (Jan- May session) Teaching assistantship for a practical course on Molecular cloning and protein purification for BS-MS and Integrated Ph.D. program, IISER-Kolkata.

2016 and 2017 (Aug-Dec session): Teaching assistantship for a practical course on Histopathology and Immunological techniques, BS-MS and Integrated Ph.D. program, IISER-Kolkata.

2014 (Aug-Dec session): A Theoretical course on Neurobiology for BS-MS and Integrated Ph.D. program, IISER-Kolkata.

Mentored several summer students/project fellows during Ph.D. tenure

Name	Period	Project Title
Rohini Gupta	May- July 2014 (Summer Student)	Infectivity of mouse hepatitis virus in microglial cell line in vitro
Neha Patil	July 2014- May 2015 (MS student)	Role of CD40 expressed by the neuron and glial cells in the pathogenesis of mouse hepatitis virus
Sayantana Chaudhary	Jan 2016- April 2016 (MS student)	Neuropathogenesis of MHV
Gayathri UV	Feb 2018- April 2018 (M.Sc. Student)	Tropism of mouse hepatitis virus strain, RSA59 in different Neuroanatomic regions of the brain
Solanki Bhattacharya	May-July 2018 (Summer Student)	Addition of one proline in the fusion domain may alter the efficiency of Mouse Hepatitis Virus-induced fusogenicity
Saurav Saswat Rout	Aug 2018-July 2019 (MS student)	Two consecutive central prolines of an internal fusion peptide of mouse hepatitis virus serve a pivotal role in axonal transport

Technical expertise:

Primary culture techniques

Establishment of mixed glial culture from neonatal mouse brain, enrichment for astrocyte and microglia culture, enrichment for meningeal fibroblast culture.

***In vivo* experimental techniques**

Intraperitoneal, Intravitreal, Intracranial injections, Intranasal inoculation, gavage feeding, tissue harvesting, protein and RNA isolation from organs, paraffin and cryosectioning.

Histopathology

Immunohistochemistry, Hematoxylin and Eosin staining, LFB staining, Immunofluorescence on tissues

Cell and molecular biology

Cell culture, virus infection, Luciferase based virus-cell fusion assay, plaque assay, FACS, immunofluorescence, protein and RNA extraction, cDNA synthesis, western blot, real-time PCR.

Biostatistics

SD, SEM, Two group and three group comparisons ANOVA

Bioinformatics

BLAST, Pymol, Chimera, VMD and Molecular Dynamics of protein using GROMACS,

Software Skills

Adobe Photoshop, Microsoft office, GraphPad Prism 6.01, Adobe illustrator, ImageJ, Imagescope.