



CURRICULUM VITAE

MRINAL SAMANTA, Ph.D.

HEAD, FHM DIVISION

PRINCIPAL SCIENTIST (PROFESSOR), MICROBIOLOGY

Department of Fish Health Management

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EDUCATION

Ph.D. (Medical Science)

2004-2008

- Hokkaido University, Institute for Genetic Medicine Graduate School of Medicine, (<https://www.med.hokudai.ac.jp/en/>) Sapporo, Japan.

Thesis title : *Studies on Epstein-Barr Virus encoded small RNAs (EBERs) modulating the innate immunity in Burkett's lymphoma cells*

M.V.Sc. (Veterinary Virology)

1991-1993

- Indian Veterinary Research Institute (<http://www.ivri.nic.in/>), Mukteswar, Uttarakhand, India.

Thesis title: *Studies On Vero-Adapted Rinderpest Vaccine ; Its Thermostability And Immunogenicity In Cattle.*

B.V.Sc. & A.H / D.V.M

1986-1991

- Bidhan Chandra Krishi Viswavidyalaya, (<http://bckv.edu.in/>), Nadia, West Bengal, India

PROFESSIONAL EXPERIENCES

Principal Scientist/Professor,
Microbiology

(2014 – onwards)

- Fish Health Management Division (FHMD), Indian Council of Agricultural Research (ICAR)-Central Institute of Freshwater Aquaculture (CIFA), Govt. of India, Kausalyaganga, Bhubaneswar, Odisha, India

Senior Scientist/ Associate Prof,
Microbiology

(2008-2011)

- FHMD, ICAR-CIFA, Govt. of India, Kausalyaganga, Bhubaneswar, Odisha, India

Scientist (Sr. Scale)/ Senior Asst.
Prof. Microbiology

(2005-2008)

- FHMD, ICAR-CIFA, Govt. of India, Kausalyaganga, Bhubaneswar, Odisha, India

Scientist/ Asst. Prof, Microbiology
(1999-2005)

- FHMD, ICAR-CIFA, Govt. of India, Kausalyaganga, Bhubaneswar, Odisha, India

Veterinary Doctor

(1994-1999)

- Worked in Animal Hospitals and at the Institute of Animal Health and Veterinary Biologicals, Kolkata, Animal Resource Development Department, Govt. of West Bengal, India.

PERSONAL STATEMENT

My current research is focused on understanding the diverse role of innate immune receptors such as toll-like receptors (TLRs), NOD-like receptors (NLRs) and retinoic acids inducible gene (RIG)-I like receptors in sensing wide array of pathogens or their products, and the cross talk between innate and adaptive immune signaling pathway in the aquatic animals like fish.

I have been trained by Prof. Kenzo Takada, a pioneer in the Epstein Barr Virus (EBV) research in my Ph.D. at the Institute for Genetic Medicine, Graduate School of Medicine, Hokkaido University, Japan. While studying EBV, we have shown that during active EBV infection, RIG-I and TLR3 recognize EBERs (EBV-encoded small RNAs) and account for immunopathological diseases resulting in the oncogenesis of human B lymphocytes and the formation of Burkett's lymphoma. In Prof. Takada's laboratory, I have learnt molecular virology, immunology and gained a broad experience in molecular biology while analysing the cell signal-transduction pathway. Over the years, I have developed expertise in microbiology and molecular immunology.

At present, I am working as a Principal Scientist (Professor), Microbiology at the Central Institute of Freshwater Aquaculture (CIFA), under the Indian Council of Agricultural Research (ICAR), Govt. of India. As a Principal investigator and Co-investigator, I have lead several multi-institutional projects of national importance such as "Toll-like receptors in phylogenetically divergent fish species-their contribution in modulating innate immunity" and "Bioprospecting of genes and allele mining for abiotic stress" funded by the National Agricultural Innovation Project (NAIP), and "Diversity and synthesis of immunoglobulins in the Indian major carps" and "Nature of Impact of abiotic stresses in three freshwater fish species" funded by the National Agricultural Science Fund (NASF) of the ICAR, Govt. of India. The most important findings of my research in fish is the identification of toll-like receptors (TLR) 2, TLR3, TLR4, TLR5, TLR9, TLR22, NOD1 and NOD2 in the Indian major carps, TLR20 and TLR21 in the Indian catfish, and their functional characterization showing the critical roles of TLRs and NLRs in pathogen recognition and binding, signal transduction and induction of innate immunity. Through computer aided modelling, we created 3D models of TLRs and NLRs of carps and unveiled their domain organizations and structural architectures. A molecular tool "LRRsearch" has been developed which can identify the "leucine-rich repeat (LRR)" motifs in various animal and plant proteins and is available freely at <http://lrrsearch.com>. We have identified a new immunoglobulin (Ig) isotype, IgZ in *Labeo rohita* and *Catla catla* and have shown the cross-talk between innate and adaptive immunity in fish, highlighting the crucial role of TLR and NLR signalling pathway in PAMPs (pathogen associated molecular patterns) recognition and IgM and IgZ synthesis involving B-cell activating factor (BAFF), MAPK and NF- κ B-signalling pathway.

In terms of teaching, I teach microbiology and immunology to the graduate students of Utkal University and Orissa University of Agriculture and Technology at ICAR-CIFA. Till date, I have supervised (major advisor) thesis of 17 M.Sc. (Microbiology and Biotechnology) students, 3 Ph.D. students, and have mentored 3 post-doctoral fellows in my laboratory. All Ph.D. students and post-doctoral fellows are now working as Post-Doctoral Fellow/ Associate in NY, Florida and Texas, USA.

RESEARCH GRANTS

Grant / Project No
ICAR-CIFA-I-88-F

- Project entitled "*Identification and characterization of organic compounds from medicinal plants for the control of diseases in freshwater fish species*" funded by ICAR-CIFA (2018-2021). Principal Investigator.

Grant / Project No
NFBSFARA-BS-4003

- Project entitled "*Diversity and synthesis of immunoglobulins in the Indian major carps*" funded by the National Agriculture Science Fund (NASF), ICAR, Govt. of India to the consortium of ICAR-CIFA and NIT-Rourkela, Odisha. (2013-2017). Consortium Principal Investigator

Grant/Project No ICAR-CIFA-I-82-A	<ul style="list-style-type: none"> • Project entitled “<i>Characterization of gill associated fish pathogens and their diagnosis and control measures.</i>” (2014-2017).Co-Principal Investigator.
Grant/Project No ICAR-CIFA-I-82	<ul style="list-style-type: none"> • Project entitled “<i>Development of PCR based diagnostics of Aeromonas hydrophila infection in freshwater fish species</i>”. (2012-2015). Principal Investigator.
Grant/Project No NFBSFARA-AS-2001	<ul style="list-style-type: none"> • Project entitled “<i>Nature of Impact of abiotic stresses in three freshwater fish species</i>” funded by the NASF to the consortium of ICAR-CIFA, KIIT University, Bhubaneswar and ICAR-CIFRI, Barrackpur, W.B. (2011-2014). Consortium Co-Principal Investigator.
Grant/ Project No NAIP-C4-C30018 (4135)	<ul style="list-style-type: none"> • Project entitled “<i>Toll-like receptors in phylogenetically divergent fish species-their contribution in modulating innate immunity</i> ” funded by the National Agricultural Innovation Project (NAIP), ICAR, Govt. of India and World-Bank to the consortium of ICAR-CIFA, ICAR-CIFRI and TANUVAS. (2009-2014).Consortium Principal Investigator.
Grant/ Project No NAIP-C4-C30033	<ul style="list-style-type: none"> • Project entitled “<i>Bioprospecting of genes and allele mining for abiotic stress</i>” funded by NAIP, ICAR, Govt. of India and World-Bank to the consortium of 36 institutes. (2010-2014). Co- Investigator
Grant/Project No ICAR-CIFA-P1-2008/ 1-FA-L-10/8310/(I-65)	<ul style="list-style-type: none"> • Project entitled “<i>Development of vaccine against Aeromonas hydrophila</i>”. (2008-2013). Co- Investigator.
Grant/Project No ICAR-CIFA- P1-2007/ 1-FA-L-10/8310 (I-57)	<ul style="list-style-type: none"> • Project entitled “<i>Induction of innate immunity in Indian Major Carps through the activation of toll-like receptors signalling</i>”. (2008-2011). Principal Investigator
Grant/Project No ICAR-APCESS/ CIFA-E-20	<ul style="list-style-type: none"> • Project entitled “<i>Studies on the Endogeneous and Exogeneous source (Microbial) of cellulose enzyme in grass carp (Ctenopharyngodon idella)</i>” funded by the ICAR-APCESS-fund. (2003-2006). Principal Investigator.
Grant/Project No ICAR-CIFA- P1-2002/ 4-FA-M-10/-8310 (I-32)	<ul style="list-style-type: none"> ▪ Project entitled “<i>Characterization of associated bacteria and viruses in carps, catfish and prawn and their role in freshwater ecosystem</i>”. (2000-2002). Co- Investigator
Grant/Project No ICAR-CIFA- P1-90/ 2-FA-M-10/8110 (I-02)	<ul style="list-style-type: none"> ▪ Project entitled “<i>Optimization of carp production through intensive aquaculture and multiple cropping</i>” (2000-2002). Co- Investigator.

HONORS AND AWARDS

<p style="text-align: center;">ASM-Indo-US- Visiting Professor of Microbiology</p>	<ul style="list-style-type: none"> • Received American Society for Microbiology (ASM) and Indo-US Science and Technology Forum (IUSSTF)-Fellowship as a Visiting Professor of Microbiology to conduct research at the University of Rochester Medical Center, New York, USA
<p style="text-align: center;">Best Poster Award (2nd prize)</p>	<ul style="list-style-type: none"> • Paper entitled “ <i>Toll-like receptors in the Indian major carps: Expression, signaling cascades and innate immunity</i>” in the International Conference on Genomics in Aquaculture, held during 22-23 January, 2013.

Fellow Award of 2012	<ul style="list-style-type: none"> • Offered by the Society For Applied Biotechnology, India, in recognition of outstanding achievements and contributions in the field of microbial Biotechnology
Best Young Scientist Award of the ICAR-CIFA 2011	<ul style="list-style-type: none"> • In recognition of highest research contribution at the Indian Council of Agricultural Research (ICAR)- Central Institute of Freshwater Aquaculture (CIFA), Govt. of India.
International Travel Award	<ul style="list-style-type: none"> • Travel award for the oral presentation of a research paper entitled "Epstein -Barr virus encoded small RNA (EBER) induces interleukin-10 (hIL-10) through RIG-I signaling at 32nd International Herpes virus Workshop, held at Ashville, NC, USA, -12th July, 2007.
MEXT Award (2004-2008)	<ul style="list-style-type: none"> • Japanese Government Fellowship (MEXT)) award for Ph.D. at the Institute for Genetic Medicine, Faculty of Medicine, Hokkaido University, Sapporo, Japan.
Best Young Scientist Award of the ICAR-CIFA 2003	<ul style="list-style-type: none"> • In recognition of the highest research contribution at the Indian Council of Agricultural Research (ICAR)- Central Institute of Freshwater Aquaculture (CIFA), Govt. of India.

TEACHING OF GRADUATE STUDENTS

- ❖ Teaching of Microbiology, Immunology and Biotechnology to the M.Sc. and Ph.D. students of Utkal University and Orissa University of Agriculture and Technology, Bhubaneswar, India.
- ❖ Former visiting Professor of Microbiology, Vidyasagar University, Midnapore, West Bengal, India

GUIDANCE OF Ph.D. STUDENTS

Ph.D. (Microbiology) Madhubanti Basu 2014	<ul style="list-style-type: none"> • Thesis title "<i>Role of some bacterial PAMPs modulating the innate immunity in freshwater fish, Cirrhinus mrigala through TLR-signalling</i>". Utkal University, Odisha. Dr. M. Basu is currently working as Postdoctoral Associate in URMIC, NY, USA. : Major Advisor
Ph.D. (Biotechnology) Banikalyan Swain 2014	<ul style="list-style-type: none"> • Thesis title "<i>Molecular characterization of NOD-like receptors modulating the innate immunity in Indian Major Carps</i>". Utkal University, Odisha. Dr.B. Swain is currently working as Postdoctoral Associate in the UF, Florida, USA. Major Advisor
Ph.D.(Life Science) Bhakti Patel 2018	<ul style="list-style-type: none"> • Thesis title "<i>Identification of immunoglobulin IgZ and IgM and the role of innate immune signalling on their synthesis in Catla catla</i>". National Institute of Technology, Rourkela, Odisha. Dr. B.Patel is currently working as a Post-doctoral fellow in Texas, USA: Co Advisor
Ph.D.(Life Science) Rajannya Banerjee 2019	<ul style="list-style-type: none"> • Thesis (submitted) title "<i>Studies on immunoglobulin D (IgD) in Catla catla (Hamilton) and role of TNF superfamily molecules in immunoglobulin synthesis</i>". National Institute of

MENTORING OF POST-DOCTORAL FELLOWS

Dr. Madhubanti Basu, Ph.D. (Microbiology) (2014-2016) ; Dr. Premranjan Kumar, Ph.D.(Biotechnology), 2016 and Dr.Thirubhaimoji Abhimanan, Ph.D.(Life science) (2016-2017) Worked as Research Associates/ Post-doctoral fellows in my laboratory and have been trained in molecular immunology. Currently, they are working as Post- doctoral fellows/associate in USA.

GUIDANCE OF M.Sc. STUDENTS (MAJOR ADVISOR)

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| M.Sc. (Microbiology).
Sushmita Sadangi
2019 | • Thesis entitled “ <i>Molecular characterization and expressional quantification of IRAK1, ERK1 and JNK1 as signal transduction mediators of innate immunity in Labeo rohita following PAMPs stimulation and pathogenic sepsis</i> ”. Odisha University of Agriculture and Technology, Odisha. |
| M.Sc. (Microbiology)
Arpita Mohanty
2019 | • Thesis entitled “ <i>TOLLIP and LGP2 in Labeo rohita : Molecular cloning, structural insights and expressional quantification following pathogenic insults and PAMPs stimulation</i> ”. Odisha University of Agriculture and Technology, Odisha. |
| M.Sc. (Biotechnology)
Itishree Chinaray
2018 | • Thesis entitled “ <i>Differential expression analysis of immunoglobulin D and Immunoglobulin M in Labeo rohita following Aeromonas hydrophila and Edwardsiella tarda infections</i> ”. MITS –School of Biotechnology /Utkal University. |
| M.Sc. (Biotechnology)
Alokkumar Giri
2017 | • Thesis entitled “ <i>Caspase 8 and caspase 9 gene of Labeorohita: Molecular cloning, characterization and expression analysis in A.hydrophila and E.tarda infection and rhabdoviral vaccination</i> ”. Siksha “O” Anusandhan University, Odisha. |
| M.Sc. (Biotechnology)
Pragnya P Sahoo
2017 | • Thesis entitled “ <i>Cloning, characterization and differential expression analysis of dicer gene in L. rohita following Gram-negative bacterial infections and rhabdoviral vaccinations</i> ”. Siksha “O” Anusandhan University, Odisha. |
| M.Sc. (Microbiology)
Sweta Satapathy
2017 | • Thesis entitled “ <i>Molecular cloning and characterization of Complement 5 gene in Labeo rohita and its differential expression following E.tarda, A .hydrophila infections and rhabdoviral vaccinations</i> ”. MITS –School of Biotechnology. |
| M.Sc. (Microbiology)
Laxmipriya Rout
2017 | • Thesis entitled “ <i>Molecular cloning and characterization of MX1-1 gene in Labeo rohita and modulation of its expression in response to A. hydrophila and E. tarda infections and rhabdoviral vaccinations</i> ”. MITS –School of Biotechnology, Utkal University. |
| M.Sc. (Biotechnology)
Archana Naik
2015 | • Thesis entitled “ <i>Molecular cloning and characterization of Major Histocompatibility Complex (MHC) gene and its modulation following bacterial infection in Labeo rohita</i> ”. Siksha “O” Anusandhan University, Odisha. |
| M.Sc.(Biotechnology)
Monika Prusty | • Thesis entitled “ <i>Cloning and characterization of T cell receptor gene and their expression in the Indian major carps,</i> |

- 2015 *rohu (Labeo rohita) following Aeromonas hydrophila infection*". TACT-Utkal University, Odisha.
- M.Sc. (Biotechnology)
Subhasmita Barik
2013
- Thesis entitled "*Identification and characterization of some toll-like receptors in the Indian catfish, magur (Clarias batrachus)*". Utkal University, Odisha.
- M.Sc. (Microbiology)
Susmita Mohapatra
2012
- Thesis entitled "*Molecular cloning and characterization of MyD88, TRAF6 and TLR2 and their differential expression following bacterial infection in Labeo rohita*". Orissa University of Agriculture and Technology, Odisha.
- M.Sc. (Microbiology).
Monalisa Ray Mohapatra
2010
- Thesis entitled "*Identification and characterization of some innate immune genes of Labeo rohita*". Orissa University of Agriculture and Technology, Odisha.
- M.Sc. (Microbiology).
Priyambada Behera
2009
- Thesis entitled "*Characterization of virulence associated genes of Aeromonas hydrophila*". Orissa University of Agriculture and Technology.
- M.Sc.(Biotechnology)
Banikalyan Swain
2009
- Thesis entitled "*Molecular characterization of interleukin -10 gene isolated from Labeo rohita*". Utkal University, Odisha.
- M. F.Sc. (Fishery Science)
Dada Saheb. B. Akolkar
2004
- Thesis entitled "*Molecular characterization of cellulolytic bacteria and their cellulase gene in freshwater fishes*". ICAR-Central Institute of Fisheries Education, Mumbai.
- M.Sc. (Microbiology).
Pushpita Mishra
2003
- Thesis entitled "*Cloning and sequencing of the 16S ribosomal RNA gene and molecular characterization of the cytotoxic proteins of the freshwater Vibrio species*". Orissa University of Agriculture and Technology, Odisha.
- M.Sc. (Microbiology)
Anupama Sahoo
2002
- Thesis entitled "*Isolation and identification of freshwater Vibrio species from freshwater carps and prawns and their molecular characterization by RAPD-PCR, PCR-RFLP, plasmid and protein profiling*". Orissa University of Agriculture and Technology, Odisha.

SUMMER PROJECTS

- M.Sc. (Life Science)
Chandan Kanta Das
2011
- Project entitled "*Inductive expression analysis of Toll-like receptor-9 gene in the Indian Major Carp, Labeo rohita by Quantitative real-time (qRT)-PCR assay*". National Institute of Technology (NIT), Rourkela, Odisha.
- M.Sc. (Life Science)
Sobha Biswal
2011
- Project entitled "*Cloning and sequencing of TLR-22 gene in the Indian Major Carp, Labeo rohita*". National Institute of Technology (NIT), Rourkela, Odisha.

PUBLICATIONS: <https://scholar.google.co.in/citations?user=okwRgtYAAAAJ&hl=en>

- ✚ Sadangi S, Mohanty A, Paichha M, **Samanta M**. Molecular characterization and expression analysis of two crucial MAPKs- jnk1 and erk1 as cellular signal transducers in *Labeo rohita* in response to PAMPs stimulation and pathogenic invasion. **J Fish Biol.** 2019 . doi: 10.1111/jfb.14244.
- ✚ Sadangi S, Mohanty A, Paichha M, Gouda S, Saha A, Das S, **Samanta M**. Molecular characterization and expressional modulation of IRAK1 as downstream signaling adaptor molecule of TLR-signaling pathways in *Labeo rohita* following

- PAMPs stimulation and bacterial infections. **Fish Shellfish Immunol.** **2019**, 28;96:161-176. doi: 10.1016/j.fsi.2019.11.064.
- ✚ Banerjee R, Roy S, **Samanta M**, Das S. Molecular cloning, characterization and expression analysis of MHCI and chemokines CXCR3 and CXCR4 gene from freshwater carp, *Catla catla*. **Microbiol Immunol.** **2019**,63(9):379-391. doi: 10.1111/1348-0421.12728.
 - ✚ Banerjee R, Kanak K, Patel B, **Samanta M**, Das S. Cloning and identification of antimicrobial peptide, hepcidin from freshwater carp, *Catla catla* on pathogen challenge and PAMPs stimulation. **3 Biotech.** **2019**, 9(9):341. doi: 10.1007/s13205-019-1874-6.
 - ✚ Nayak M, Giri SS, Pradhan A, **Samanta M**, Saha A. Effects of dietary α -linolenic acid/linoleic acid ratio on growth performance, tissue fatty acid profile, serum metabolites and $\Delta 6$ fad and elovl5 gene expression in silver barb (*Puntius gonionotus*). **J Sci Food Agric.** **2019**, doi: 10.1002/jsfa.10177.
 - ✚ Patel B, Banerjee R, Basu M, Lenka SS, Paichha M, **Samanta M**, Das S. Toll like receptor induces Ig synthesis in *Catla catla* by activating MAPK and NF- κ B signaling. **Mol Immunol**, **2019** ;105 : 62-75 <https://doi.org/10.1016/j.molimm.2018.11.012>.
 - ✚ Lenka SS, Paichha M, Basu M, **Samanta M**. LrHMGB1 Shares Structural Similarities with Human HMGB1, and Its Expression Is Induced in Bacterial Infection, Antiviral Vaccination, and Pathogen-Associated Molecular Patterns Stimulation. **DNA Cell Biol**,**2018**; 37(8):708-723.
 - ✚ Giri AK, Paichha M, Saha A, Das S, **Samanta M**. Lrcasp9 shares similarity in structural motifs with human caspase-9 and is activated following bacterial infection and anti-viral vaccination. **3 Biotech**, **2018**; 8:340.
 - ✚ Patel B, Banerjee R, **Samanta M**, Das S. Diversity of Immunoglobulin (Ig) Isotypes and the Role of Activation-Induced Cytidine Deaminase (AID) in Fish. **Mol Biotechnol**, **2018**; 60(6):435-453.
 - ✚ Pradhan A, Nayak M, **Samanta M**, Panda RP, Rath SC, Giri SS, Saha A. Gonadotropin receptors of *Labeo rohita*: Cloning and characterization of full-length cDNAs and their expression analysis during annual reproductive cycle. **Gen Comp Endocrinol**, **2018**; 263:21-31.
 - ✚ Nayak M, Saha A, Pradhan A, **Samanta M**, Mohanty T K, Giri SS. Influence of dietary lipid levels on growth, nutrient utilization, tissue fatty acid composition and desaturase gene expression in silver barb (*Puntius gonionotus*) fingerlings. **Com. Biochem. and Physio Part B**, **2018**; 226: 18-25
 - ✚ Nayak M, Pradhan A, Giri SS, **Samanta M**, Konkimalla BV, Saha A. Molecular characterization, tissue distribution and differential nutritional regulation of putative Elovl5 elongase in silver barb (*Puntius gonionotus*). **Com. Biochem. and Physio Part B**, **2018**; 217: 27-39
 - ✚ **Samanta M**, Basu M, Swain B, Paichha M, Lenka SS, Das S, Jayasankar P, Maiti NK. Molecular cloning and characterization of LrTLR4, analysis of its inductive expression and associated down-stream signaling molecules following lipopolysaccharide stimulation and Gram-negative bacterial infection. **Fish Shellfish Immunol**, **2017**; **60**:164-176
 - ✚ Banerjee R, Patel B, Basu M, Lenka SS, Paicha M, **Samanta M**, Das S. Molecular cloning, characterization and expression of immunoglobulin D (IgD) on pathogen

- challenge and PAMPs stimulation in freshwater carp, *Catla catla*. **Microbiol Immunol**, 2017; 61 (10): 452-458
- ✚ Patel B, Kumari S, Banerjee R, **Samanta M**, Das S. Disruption of the quorum sensing regulated pathogenic traits of the biofilm-forming fish pathogen *Aeromonas hydrophila* by tannic acid, a potent quorum quencher. **Biofouling**, 2017;33(7):580-590
 - ✚ Nayak M, Saha A, Pradhan A, **Samanta M**, Giri, SS. Dietary fish oil replacement by linseed oil: Effect on growth, nutrient utilization, tissue fatty acid composition and desaturase gene expression in silver barb (*Puntius gonionotus*) fingerlings. **Com. Biochem. and Physio Part B**, 2017; 205:1-12
 - ✚ Basu M, Lenka SS, Paichha M, Patel B, Banerjee R, Das S, Jayasankar P, **Samanta M**. 2016. B cell activating factor is induced by toll-like receptor and NOD-like receptor-ligands and plays critical role in IgM synthesis in *Labeo rohita*. **Mol Immunol**, 2016. 78:9-26.
 - ✚ Basu M, Lenka SS, Paichha M, Swain B, Patel B, Banerjee R, Jayasankar P, Das S, **Samanta M**. Immunoglobulin (Ig) D in *Labeo rohita* is widely expressed and differentially modulated in viral, bacterial and parasitic antigenic challenges. **Vet. Immunol. Immunopathol**, 2016; 179:77-84.
 - ✚ Patel B, Banerjee R, Basu M, Lenka S, **Samanta M**, Das S. Molecular cloning of IgZ heavy chain isotype in *Catla catla* and comparative expression profile of IgZ and IgM following pathogenic infection. **Microbiol Immunol**, 2016; 60(8): 561-567
 - ✚ Patel B, Kumar P , Banerjee R , Basu M , Pal A, **Samanta M**, Das S. *Lactobacillus acidophilus* attenuates *Aeromonas hydrophila* induced cytotoxicity in catla thymus macrophages by modulating oxidative stress and inflammation. **Mol Immunol**, 2016; 75:69-83. doi: 10.1016/j.molimm.2016.05.012.
 - ✚ Tripathy S, Padhi SK, Sen R, Maji,U, **Samanta M**, Mohanty S, Maiti NK. Draft Genome Sequence of *Brevibacillus borstelensis* cifa_chp40, a Thermophilic Strain Having Biotechnological Importance. **J Genomics**, 2016; 4: 4–6.
 - ✚ Tripathy S, Padhi SK, Mohanty S, **Samanta M**, Maiti NK . Analysis of the metatranscriptome of microbial communities of an alkaline hot sulfur spring revealed different gene encoding pathway enzymes associated with energy metabolism . **Extremophiles**, 2016; 20(4):525-536
 - ✚ Tripathy S, Padhi SK, Sen R, Mohanty S, **Samanta M**, Maiti NK. Profiling of *Brevibacillus borstelensis* transcriptome exposed to high temperature shock. **Genomics**, 2016; 107 (1), 33-39
 - ✚ Saha A, Pradhan A, Sengupta S, Nayak M, **Samanta M**, Sahoo L, Giri SS. Molecular characterization of two kiss genes and their expression in rohu (*Labeo rohita*) during annual reproductive cycle. **Comp Biochem Physiol B Biochem Mol Biol**, 2016; 191:135-145
 - ✚ Basu M, Paichha M, Lenka SS, Chakrabarti R, **Samanta M**. Hypoxic stress: impact on the modulation of TLR2, TLR4, NOD1 and NOD2 receptor and their down-stream signalling genes expression in catla (*Catla catla*). **Mol Biol Rep**, 2016; 43(1) 1-9 DOI 10.1007/s11033-015-3932-4.
 - ✚ Basu M, Paichha M, Swain B, Lenka SS, Singh S, Chakrabarti R, **Samanta M**.

Modulation of TLR2, TLR4, TLR5, NOD1 and NOD2 receptor gene expressions and their downstream signaling molecules following thermal stress in the Indian major carp catla (*Catla catla*). **3 Biotech**, **2015**; 5(6) 1021-1030 DOI 10.1007/s13205-015-0306-5.

- ✚ Swain B, Basu M, Lenka SS, Das S, Jayasankar P, **Samanta M**. Characterization and inductive expression analysis of interferon gamma related (IFN- γ rel) gene in the Indian major carp, rohu (*Labeo rohita*). **DNA Cell Biol**, **2015**; 34(5):367-378 DOI: 10.1089/dna.2014.2656.
- ✚ Bej A, Sahoo BR, Swain B, Basu M, Jayasankar P, **Samanta M**. LRRsearch : An asynchronous server-based application for the prediction of leucine-rich repeat motifs and an integrative database of NOD like receptors. **Comput. Biol Med**, **2014**; 53:164-70.
- ✚ **Samanta M**, Swain B, Basu M, Mahapatra GB, Sahoo BR, Paichha M, Lenka SS, Jayasankar P. Toll-like receptor 22 (TLR22) in *Labeo rohita* : Molecular cloning, characterization, 3D modeling and expression analysis following ligands stimulation and bacterial infection. **Appl Biochem Biotechnol**, **2014**; 174(1):309-327.
- ✚ Behera T, Swain P, Rangacharulu PV, **Samanta M**. Nano-Fe as feed additive improves the hematological and immunological parameters of fish, *Labeo rohita* H. **Appl Nanosci**, **2014**; 4:687–694
- ✚ Rauta PR, **Samanta M**, Dash HR , Nayak B , Das S. Toll-like receptors (TLRs) in aquatic animals: Signaling pathways, expressions and immune responses. **Immunology letters**, **2014**; 158 (1): 14-24
- ✚ Iwakiri D, Minamitani T, **Samanta M**. Epstein-Barr virus latent membrane protein 2A contributes to anoikis resistance through ERK activation. **J Virol**, **2013**. 87(14):8227-34.
- ✚ **Samanta M**, Basu M, Swain B, Panda P, Jayasankar P. Molecular cloning and characterization of Toll-like receptor 3, and inductive expression analysis of type I IFN, Mx and pro-inflammatory cytokines in the Indian carp, rohu (*Labeo rohita*). **Mol Biol Rep**, **2013**; 40 (1): 225-235
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BOOKS

- ❖ Food Safety and Human health : contributed a chapter “ safety of fish and sea food”pp.169-187
- ❖ Advances in Biochemistry and Biotechnology Vol.2: contributed a chapter “ Pattern Recognition Receptors and Innate immunity” pp.67-66.
- ❖ Atlas on SHARKS- The Inside Story – Co-authored with the faculty of TANUVAS, Tamil Nadu

PATENTS

A patent application on the “*Process for purification of ABC binding protein of Aeromonas hydrophila*” has been filed vide application no. 672/KOL/2014 dt 20/06/2014. The application is under official processing.

GENBANK REGISTRATIONS

GU220782	GU248415	GU220772	GU220780	GU230760	HQ221997	JN247431
GU220783	GU248416	GU220773	GU230766	GU230761	HQ221996	JN247432
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KC136289	KC921211	KC958584	KC958592	KC994616	KF007224	KF007232
KC136290	KC921212	KC958585	KC994609	KC994617	KF007225	KF007233
KC136291	KC921213	KC958586	KC994610	KC994618	KF007226	KF007234
KC113242	KC921214	KC958587	KC994611	KC994619	KF007227	KF007235
KC113243	KC921215	KC958588	KC994612	KC994620	KF007228	KF007236
KC113244	KC921216	KC958589	KC994613	KC994621	KF007229	KF876684
KC921209	KC921217	KC958590	KC994614	KF007222	KF007230	KF876685
KC921210	KC958583	KC958591	KC994615	KF007223	KF007231	KJ187303
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- Journal of Fish Diseases
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- Molecular Biology Report
- Molecular Immunology
- PNAS-Indian section
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RESEARCH GRANT EVALUATOR

- ❖ Department of Biotechnology (DBT), Government of India
- ❖ Science and Engineering Research Board (SERB), Department of Science and Technology, Govt. of India

MEMBER OF NATIONAL/ INTERNATIONAL PROFESSIONAL BODIES

- American Society for Microbiology (ASM)
- Indian. Association of Veterinary Microbiology & Immunology (IAVMI)
- Association of Aquacultures (AOA)
- Asian Fisheries Society (AFS)
- Indian Science Congress Association (ISCA)
- National Environmental Science Academy (NESA)