

## **GOVERNMENT GENERAL DEGREE COLLEGE, KESHIARY** PASCHIM MEDINIPUR, PIN 721135, WEST BENGAL

1. Name	: Dr. Suman Mukherjee
2. Designation	: Associate Professor (W.B.E.S.)
3. Department	: Zoology
4. Highest Academic Degree	: M.Sc, M.Tech, PGDEnV.MgM, Ph.D.
5. Specialization	: Parasitology and Immunology, Biotechnology, Ecotoxicology
6. Contact Number	: 9830359087
7. E-mail	: biosmukherjee@gmail.com
8. Vidwan ID	:
9. Date of Joining to the service	: 12.04.2010
10. College Served	:

Name of the college	Form	Till
1. A.B.N. Seal College, Cooch Behar	12.04.2010	03.12.2014
2. Bidhannagar College	04.12.2014	24.02.2025
<b>3.</b> GGDC, Keshiary	25.02.2025	Continuing

\* Engaged in Career Advancement Related Work in the Office of the Director of Public Instruction, Education Directorate Bikash Bhavan, SaltLake, kolkata-700091from 18.07.2024 to 06.01.2025.

11. Area of research interest

: Ecotoxicology, Parasitology and Immunology, Bio-technology

## 12. Publication

Paper / Resear Article	rch	Book/ Book Chapter		Citation	ΣIF	H- index	i- Index	Abstrac t
International	National	International	National			muex	muex	L
12	20	2	5					19

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13. Award/ Achievements of special mention

**1.** Young Scientist Award on "Environment Biomonitoring & Health Management Session" in National Seminar on Dimensions in Zoological Research in Human Welfare (organized by the ZSI, Kolkata and Dept. Zoology, C.U.), Kolkata, West Bengal, 2007.

**2.** Jyoti Bora Foundation Award on Poster presentation on Short Term course in "Cancer Biology 2011: Basic Theoretical aspects" organized by I.I.T. Guwahati Biotech Hub (Funded by DBT, Govt. of India), 2011.

1. Editorial member of Iterative International

Publishers and Acta Scientific Veterinary

2. Reviewer of Annual Research and Review

1.Life Member of The Zoological Society,

2.Life Member of The Indian Science

Congress Association, Kolkata.

14. Research project/ external grant mobilized

Funding agency/Body	Amount	Name of the research project	Form	Till
1. UGC Sponsored Minor project [UGC sanction No- F. PSW.72/12-13(ERO)] dated18.02.2013](Principal Investigator).	Rs.1,28,000/-	Cellular and metabolic response of <i>Channa</i> <i>punctatus</i> exposed to sodium arsenite.	20.03.2013	19.03.2015
2. Science & Technology and Biotechnology Department, Govt. of West Bengal sanctioned Major Project [Sanction No. 1240(Sanc.)/ STBT- 11012(27)/9/2024-ST SEC dated 07.02.2025] (Presently CoInvestigator).	Rs.19,90,000/ -	Epidemiological surveillance of waterborne <i>Vibrio sp.</i> Diversity following climate change and its impact on gastrointestinal dysbiosis in Sunderbans fisherpersons.	21.04.2025	Continuing

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Sciences.

in Biology.

Kolkata.

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- 16. Editorial board member/ Reviewer of any journal/ Literary body
- 17. Members of learned society
- 18. List of full length publication (year wise descending order)

## A. A. <u>Research Paper (Journal)</u>:

**1.** Saha, S and **Mukherjee**, **S.** 2025. Response of the coelomocyte of *Metaphire posthuma* to chlorpyrifos toxicity. *Journal of Stress Physiology & Biochemistry*, **21(1)**:178-188. [ISSN: 1997-0838][UGC Care list Group I].

**2.** Mandal, C and **Mukherjee**, **S.** 2023. Phagocytic response and phenoloxidase activity of the hemocytes of *Bellamya bengalensis* exposed to synthetic fenvalerate. *Journal of Stress Physiology* & *Biochemistry*, **19(3)**:143-151.[ISSN: 1997-0838][UGC Care list Group I].

**3.Mukherjee, S** and Medda, L. 2022. Seasonal incidence and histopathologic study of protozoan infestation in *Clarias sp.*, collected from a local fish market of Kolkata, West Bengal (India), *Applied Biological Research*, **24**(2):240-244. [DOI:10.5958/0974-4517.2022.00027.1][UGC Care list Group I, WOS Index]

**4.** Ghosh, T and **Mukherjee**, **S.** 2022.Cross-Linked Ionic Polysaccharides: Insights from the Structure to Stimuli-Sensitive Drug Delivery System Applications, *Asian Journal of Chemistry*, **34(5)**:1066-1072.[https://doi.org/10.14233/ajchem.2022.23722][UGC Care list Group I, Scopus Index].

5. Mukherjee, S and Medda, L. 2022. A Survey on Parasitic Prevalence of Gut in

*Heteropneustes fossilis* Collected from Local Market of Kolkata, *Research Journal of Agricultural Sciences An International Journal*, **13(1)**: 173-175. [P- ISSN: 0976-1675 E- ISSN: 2249-4538][UGC Care list Group I].

**6. Mukherjee, S.** 2021. Evaluation of Phagocytosis and Cytotoxicity Response in Fresh Water Snail, *Bellamya bengalensis*, following Exposure to Chlorpyrifos, *Research Journal of Agricultural Sciences An International* Journal, **12(4):** 1262-1266.[P- ISSN: 0976-1675

E- ISSN: 2249-4538][UGC Care list Group I].

**7.Mukherjee, S.** 2021. The modulation of oxidative stress biomarkers in assessing arsenic induced toxicity in *Channa punctatus, Applied Ecology and Environmental Sciences*, **9(3):** 340-346.[ISSN: 2328-3912][UGC Care list Group I].

**8.** Mandal, C and **Mukherjee**, **S.** 2021.Effect of fenvalerate on superoxide anion and nitric oxide generation in the juveniles of *Bellamya bengalensis* an edible gastropod of West Bengal, *Uttar Pradesh Journal of Zoology*, **41(10):** 77-85. [ISSN: 0256-971X(P)][UGC Care list Group 1WOS Indexed].

**9.** Ghosh, T., **Mukherjee, S.** and Adhikari, D. 2020. Evauation of acute toxicity studies on copperinduced oxidative stress in *Lathyrus sativus* L., (Variety Ratan) germinating seeds: A biomarker based risk assessment. *Journal of Advanced Scientific Research*, **11(4)**: 243-254.[ISSN: 0976-9595][UGC Care list Group I]

**10.Mukherjee, S.,** Biswas, I. and Adhikari, D. 2020. Assessment of gut heminth of Back Bengal Goat slaughtered at Kolkata Market, West Bengal, India, *Uttar Pradesh Journal of Zoology*, **41(10)**: 77-85. [ISSN: 0256-971X(P)][UGC Care list Group I, WOS Indexed].

**11.** Mukherjee, S. and Dasgupta, R. 2018. Surveillance of protozoan infestation in skin and gill of *Channa punctatus* collected from local market of Kolkata., *Asian journal of Biology.*, **6(1):** 1-8. [ISSN: 2456-7124].[UGC Approved Journal No.63718].

**12.** Mukherjee, S., Ray, M. and Ray, S. 2018. Azadirachtin induced ultrastructural changes on haemocyte in *Lamellidens marginalis.*, *Indian Journal of Environmental Science.*, **22(1):** 47-49. [ISSN: 0971-8958].[UGC Approved Journal No.64745].

**13. Mukherjee, S.,** Bose, T., Ray, D. and Adhikari, D. 2018. Evaluation of toxicity of chlorpyrifos on the haemocyte of *Pila globosa. Journal of Biological and Chemical Research.*, **35(1)**:262-272. [ISSN: 0970-4973 (Print), 2319-3077(Online)].[UGC Approved Journal No.62923].

14.Bej, S., Chatterjee, H, N., Giri, L., Mukhopadhyay, K, S., Ganguly, P. and Mukherjee, S. 2017. Modulation of blood profile of juvenile *Cyprinus carpio* exposed to imidacloprid. *International Journal of Life Science.*, **5(4)**: 627-630. [ISSN: 2320-7817 (Print), 2320-964X (Online)].[UGC Approved Journal No.48591]

**15.Mukherjee, S.** 2017. Histopathological profile of freshwater teleost, *Channa punctatus* exposed to arsenic. *Indian Journal of Scientific Research.*,**16(1):** 38-42. [ISSN:0976-2876 (Print), 2250-0138 (Online)].[UGC Approved Journal No.20876].

**16.Mukherjee, S.,** De, S. and Sardar, P. 2016. The Gastrointestinal helminths infection among backyard fowl population of selected areas of North 24 parganas, West Bengal. *Biological Forum.*,**8**(2):181-185.[ISSN: 0975-1130 (Print), 2249-3239 (Online)].

**17.**Adhikari, D., **Mukherjee, S**., Ghosh, T. and Roy, D. 2016. Biotic and Abiotic stressors in Plant Molecular Breeding vis-à-vis sustainable Molecular Farming strategies for food security: Threats, opportunities and challenges ahead in Indian perspectives. *IJARIIE.*,**2(3)**:609-617.[ISSN: 2395-4396 (Online)].

**18. Mukherjee, S.**, Ray, D., Adhikari, D. and Ghosh, T. 2015. Impairment of haematological profile of *Channa punctatus* exposed to sodium arsenite. *International Journal of Applied Biology and Pharmaceutical Technology*, **6(2)**:223-229. [ISSN: 0976-4550].

**19.**Ghosh, T., Adhikari, D., **Mukherjee, S.** and Roy, D. 2015. Structural features and biological activities of water extracted polysaccharides obtained from *Adhatoda vasica*. *BN Seal Journal of Science*, **6**(1): 82-98. [ISSN: 0975-5624].

**20.**Adhikari, D., **Mukherjee, S**. and Ghosh, T. 2014. Zooceuticals-Promising bio-molecules for synthetic simulation. *Manan.*,**1**(2):11-18. [ISSN: 2348-3849].

**21.Mukherjee**, S., Roy, D., Ghosh, T. and Adhikari, D. 2014. Characterization of biochemical profile of Hepatitis B patient. *BN Seal Journal of Science.*, **6(1)**: 118-125. [ISSN: 0975-5624].

**22.** Goswami, S., Mukherjee, A., Saha, S., Ghosh, T., Roy, D., Ghosh, T., Adhikari, D. and **Mukherjee, S.** 2013. Cellular and metabolic response of haemocyte of *Lobothelphusa sp.* invaded with wound. *BN Seal Journal of Science*, **5**(1): 100-114. [ISSN: 0975-5624].

**23.** Dipan, A., Samanta Kr. S., Karmakar, S., Gorain, B., **Mukherjee, S.** and Sen, T. 2013. Evaluation of toxicological characteristics of the venomous sea anemone-*Paracondylactis indicus* Dave, an endemic species of the Sunderbans. *Indian Journal of Social and Natural Science*, **2(1)**: 12-28. [ISSN: 2277-6117].

**24.**Tuhin, G., Saha, S., Roy, D., Adhikari, D., Mukherjee, S. 2013. Structural features and antioxidant capacity of polysaccharides from *Turbinaria ornate*. *BN Seal Journal of Science.*,**5**(1): 19-34. [ISSN: 0975-5624].

**25.** Mukherjee, S., Ray, M. and Ray, S. 2012. Oxidative stress in freshwater bivalve of India exposed to azadirachtin based pesticide. *Romanian Journal of Biology.*,**57(1)**:79-88. [ISSN 2248-379 (online), (ISSN-L 1843-7761)].[UGC Care list Group I].

**26.** Mukherjee, S., Ray, M. and Ray, S. 2011. Antioxidant and detoxification activities of gill and digestive gland of *Lamellidensmarginalis* (Mollusca: Bivalvia) exposed to azadirachtin. *Animal Biology Journal*, **2(4)**:1-10. [ISSN: 1949-498].

**27.** Kundu, S., Roy, I., Sarkar, Ch, B., Lahiri, A., Saha, T. and **Mukherjee, S.** 2011. Dynamics of total haemocyte count and nonself surface adhesion response of haemocyte of *Bellamya bengalensis* exposed to chlorpyrifos. *BN Seal Journal of Science.*, **4**:50-55. [ISSN: 0975-5624].

**28.Mukherjee, S.**, Ray, M. and Ray, S. 2009. Immunotoxicity of azadirachtin in freshwater mussel in relation to surface adhesion of hemocytes and phagocytosis. *Animal Biology Journal*, **2**: 1-7. [ISSN: 1949-498X].

**29.**Chakraborty, S., **Mukherjee, S.**, Dasgupta, S., Chattopadhyay, S., Dube, S. N., Barua, I., Ray, M. and Ray, S. 2007. Analyses of morphological variations of the murine brain cell nuclei exposed to antimalarial herbal extract. *Environment and Ecology*. **25S(1)**: 122-124. [ISSN: 0970-0420].

**30.**Chakraborty, S., **Mukherjee**, S., Dasgupta, S., Chattopadhyay, S., Dube, S. N., Barua, I., Ray, M. and Ray, S. 2007. Nuclear variations of murine brain cells exposed to an antimalarial herbal extract. *Environment and Ecology*.**25S** (1): 194-196. [ISSN: 0970-0420].

**31.Mukherjee, S.**, Chakraborty, S., Dasgupta, S., Chattopadhyay, S., Dube, S. N., Barua, I., Ray, M. and Ray, S. 2007. Spectrum of nuclear morphology of murine brain cell exposed to khayer, a reported antimalarial herbal formulation. *Indian Journal of Animal Health.***46 (2):** 97-100. [ISSN: 0019-5057].

**32**. **Mukherjee**, S., Ray, M. and Ray, S. 2006. Azadirachtin induced modulation of total count of haemocytes of an edible bivalve *Lamellidens marginalis*, Proceedings of Zoological Society Calcutta., **59(2)**: 37 – 39. [ISSN: 0373-5893].

## B. Research Paper (Book Chapter/Edited Volume):

**1.**Adhikari, D, **Mukherjee, S.**, Ghosh, T.2019. Climate changes vis-à-vis Environmental Actions and Forest Management with special reference to Sunderban Biosphere: Measurement to protect Bioresource From Socio-Political and Biological Perspectives to meet a Better Future. In "*Cross-cutting research in Social Sciences*", UGC-Human Resource Development Centre, University of Calcutta, West Bengal, India, **pp.286-304**. [ISBN: 978-81-939363-0-6].

**2.** Ghosh, T., Roy, N., Roy, D., **Mukherjee, S.** and Adhikari, D. 2017. Antioxidant activity of Strawberry fruit and Senna leaf extract. In *"A Comprehensive Study of Science"*. Santal Bidroha Sardha Satabarsiki Mahavidyalaya. West Bengal, India, **pp. 79-87**. [ISBN: 978-81-930138-4-7].

**3**. Adhikari, D., **Mukherjee**, S., Ghosh, T. and Sinha, D. 2014. Validation of plant bioassays with special reference to *Allium Cepa L* test to screen and evaluate different genetic endpoints on xenobiotic exposure. In "*Impact of Pollution: Assessment and Awareness*". Nabajatak Prakashan. India, **pp.120-135**. [ISBN: 978-81-921083-8-4].

**4.Mukherjee, S.,** Ray, M. and Ray, S. 2011. Phagocytosis of charcoal particulate as immunological marker of azadirachtin exposure. In "*Perspectives in Animal Ecology and Reproduction*". Chapter **5 (7)**. (Eds. V. Gupta) Daya publication, India, **pp. 55-67**.[ISBN: 978-81-703574-6-9].

5. Ray, S., Ray, M., Chakraborty, S. and Mukherjee, S. 2011. Immunotoxicity of environmental chemicals in the pearl forming mussel of India-a review. In *"Mussels: Anatomy, Habitat and Environmental Impact"*. Chapter 19(1). (Eds. Lauren E. McGevin) Nova publication, USA. pp. 429-440. [ISBN: 978-1-61761-763-8].

6. Mukherjee, S., Ray, M. and Ray, S. 2011. Anticoagulant and carbohydrate induced interference of aggregation of mussel haemocyte under azadirachtin exposure. In "*Mussels: Anatomy, Habitat and Environmental Impact*". Chapter 20 (1). (Eds. Lauren E. McGevin) Nova publication, USA.pp.441-452. [ISBN: 978-1-61761-763-8].

**7. Mukherjee, S.,** Ray, M. and Ray, S. 2007. Dynamics of hemocye subpopulation of *Lamellidens marginalis* exposed to a neem based pesticide. In *"Zoological Research in Human Welfare"*. Paper40. (Eds. Ramakrishna and R. N. Chatterjee) ZSI, Kolkata publication, **pp.389-394.** 

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- 19. List of Published abstract (year wise descending order)
- 1.Association of Haematological, Biochemical parameters with Immune Mediated Pathogenesis in Dengue virus Infection in One day State Level Seminar & Poster Presentation on "Selection or Elimination !- Which one does a Virus? Organized by Dept. of Zoology, Ramkrishna Mission Vidyamandira, Belur, Howrah, West Bengal, April 12<sup>th</sup>, 2023.
- 2. Study of Haemocyte response of Freshwater Gastropod as Biomarker of Chlorpyrifos Toxicity in Multidisciplinary National seminar on "Decentralised Governance and Changing Primary Research Methods in Rural Areas of the Country: A Transformational Study" organized by Murarka College, Sultanganj in association with Toucan Research and Development, April 4<sup>th</sup> -5<sup>th</sup>, 2022.
- **3**.Evaluation of Biochemical and Morphological response of a Freshwater Edible Mollusc exposed. to Bordeaux Mixture in International Multidisciplinary Webinar on "Climate change Impact on Agriculture, Environment and Sustainable Development organised by International Academy of Science and Research (IASR), Kolkata, West Bengal, Gurukul Edutech Education and Research Foundation, Kolkata, West Bengal, February 11<sup>th</sup> to 13<sup>th</sup>, 2022.
- 4. Diversity and Prevalence of Helminth Parasite in Gastrointestinal Tract of Black Bengal Goat in National Seminar on" Diversity in the Era of Globalization Challenges and Management organized by Bidhannagar College, sponsored by Dept. of Higher Education, Govt. of West Bengal and Dept. of Science & Technology and Biotechnology, Govt. of West Bengal, February 22<sup>nd</sup> to 23<sup>rd</sup>, 2020.

- 5. Cellular and Biochemical response of *Bellamya bengalensis* and Bordeaux mixture in 4<sup>th</sup> Regional Science and Technology Congress (Southern Zone) organised by Dept. of Science & Technology and Biotechnology, Govt. of West Bengal and Maulana Abulkalam Azad University of Technology, West Bengal, December 23<sup>rd</sup> to 24<sup>th</sup>, 2019.
- 6. Parasitic Infestation of *Heteropneustes fossilis* collected from local market of Kolkata in National Seminar on "Frontiers In Biotechnology organised by Dept. of Biotechnology, *St.* Xavier's College (Autonomous), Kolkata, October, 12<sup>th</sup> 2018.
- Nitric oxide-an immunobiological molecule in International Seminar on Environmental Pollution and Impacts on Public Health organized by Dept. of Physiology and Zoology, SantalBidrohaSardhaSatabarshikiMahavidyalaya, Goaltore, Paschim Medinipore, West Bengal, India, January,3<sup>rd</sup>, 2017.
- **8.** Histopathology for the detection and identification of parasite in skin, gill and stomach of *Channa punctatus* in National Seminar Workshop on Scientific Devices, Technology Applications and Community Linkage organized by TEQIP and Centre of Excellence, University of Calcutta, September, 18<sup>th</sup> -19<sup>th</sup>, 2017.
- **9.** Diversity of parasites infecting stomach and intestine of *Channa punctatus* in UGC sponsored National Seminar on From Molecules to Ecosystem-A Zoological perspective (organized by Dept. of Zoology, Ramkrishna Mission Vivekananda Centenary College, Rahara, in collaboration with West Bengal State University, September, 22<sup>nd</sup>, 2016.
- 10. Innate immune response of amphibian mollusc in tissue injury in National Seminar on Recent Advances in Life Science in the light of chemistry (organised by Dept. of Chemistry, Bethune College in collaboration with Royal Society of Chemistry (Eastern Indian Section), September, 9<sup>th</sup>, 2016.
- 11. Study of parasitic infestation in gill and skin of *Channa punctatus* in UGC sponsored National Seminar On Conservation of Biodiversity and National Resources in Sustainable Development (organised by Dept. of Zoology, APC College, New Barrackpore in collaboration with Dept. of Zoology, Bajkul Milani Mahavidyalaya), September, 6<sup>th</sup> -7<sup>th</sup>, 2016.
- **12.** Cytotoxic response of *P. globosa* and chlorpyrifos based pesticide in UGC sponsored National Seminar on Role of Biodiversity And Natural Resources In Sustainable Development (organised by Dept. of Zoology, Bajkul Milani Mahavidyalaya), PurbaMednipore, January, 13<sup>th</sup>, 2016.
- 13. Metabolic interaction of *Channa punctatus* and arsenic in UGC sponsored National Seminar on A Journey Through Recent Development In Chemistry (organized by Department of Chemistry, A.B.N. Seal College, Cooch Behar in collaboration with Department of Chemistry, University of North Bengal, Darjeeling), Coochbehar, West Bengal, March, 1<sup>st</sup> -2<sup>nd</sup>, 2012.
- 14. Telomere and telomerase activity in human endometriosis and ovarian carcinoma in Short term course on Cancer Biology2011: Basic Theoretical Aspects (organised by IITG Biotech Hub, funded by DBT, Govt. of India and Centre for Environment, IIT, Guwahati), Guwahati, August 26<sup>th</sup> -27<sup>th</sup>, 2011.
- 15. Phagocytosis and cytotoxic response by haemocytes of freshwater mussel as biomarker of azadirachtin toxicity in UGC-ANU, MOES, DST, APPCB and CSIR sponsored International Conference on Biodiversity and Aquatic Toxicology (organised by Department of Zoology and Aquaculture, Acharya Nagarjuna University, Nagarjunanagar), Andhra Pradesh, February, 12<sup>th</sup> 14<sup>th</sup>, 2011.
- 16. Dynamics of hemocye subpopulation of *Lamellidens marginalis* exposed to a neem based pesticide in Proceedings in National Seminar on Dimensions in Zoological Research in Human Welfare (organized by the ZSI, Kolkata and Dept. Zoology, C.U), Kolkata, West Bengal, March 23<sup>rd</sup> 25<sup>th</sup>, 2007.
- 17. Evaluation of alteration of total count and phagocytic efficiency of hemocytes of *Lamellidens marginalis* exposed to azadirachtin based pesticide in Proceeding in International Conference on Toxicology, Environmental and Occupational Health and Society of Toxicology (ICTEOH & 25<sup>th</sup> STOX), Lucknow, U.P. India, November 14<sup>th</sup> 17<sup>th</sup>, 2005.

- Recovery of hemocyte density of *Bellamya bengalensis* exposed to fenvalerate in National Seminar on New Dimensions in Environmental Sciences (organized by the Indian Science Congress Association Bhopal Chapter) Bhopal, M.P. March 5<sup>th</sup> -6<sup>th</sup>, 2005.
- **19.** Azadirachtin and arsenic induced alteration of hemocyte count in fresh water bivalve, *Lamellidens marginalis* in
- National Seminar on New Dimensions in Environmental Sciences (organized by the Indian Science Congress Association Bhopal Chapter) Bhopal, M.P. March 5<sup>th</sup> -6<sup>th</sup> , 2005.
- 20. List of Seminar/ Workshop/ Conference/ Symposium attended (year wise descending order)
- 1. Short Term Course on MOOCS, E-Content Development and Open Educational Resources in UGC-HRDC, University of North Bengal, 01.10.2021 to 09.10.2021.
- 2. Short Term Course on Research Methodology in UGC-HRDC, NEHU, Shillong, 20.08.2021to 26.08.2021.
- **3.** 21 days UGC sponsored Refresher Course on Tea Science in Academic Staff College, University of North Bengal, 14. 11. 2018 to 04.12.2018.
- 4.7 days DST, India and UGC sponsored Workshop on "Basic Techniques of Molecular

Biology" in Dept. of Botany, University of Calcutta, 14.05.2014 to 21.05.2014.

- 5. 21 days UGC sponsored Refresher Course on Environmental Science in Academic Staff
- College, University of Calcutta, 18.02.2014 to 10.03.2014.
- **6.** 2 days DST, India and UGC sponsored Workshop on "Chromatography-the catapult for unraveling the facts of Nature" in Dept. of Botany, University of Calcutta, 26.12.2013 to 27.12.2013.
- **7.** 28 days UGC sponsored Orientation Course in Academic Staff College, University of Burdwan, 31.10.2012 to 27.11.2012.
- **8.** 7 days Workshop for College Teachers "On Application of Flow Cytometry, Cell Sorting & Imaging in BiologicalResearch" in Centre for modern biology& Centre for Research in
- Nanoscience and Nanotechnology, University of Calcutta in collaboration with BD, February, 18.02.2012 to 24.02.2012.
- **9.** Short term course on "Cancer Biology2011: Basic Theoretical Aspects" in IITG Biotech Hub, funded by DBT, Govt. of India and Centre for Environment, IIT, Guwahati), Guwahati, 26.08.2011 to 27.08.2011.
- **10.** UGC sponsored National Workshop on "Understanding Biodiversity: Assessment, Analysis and Conservation" in Department of Zoology, Maulana Azad College, Kolkata, 25.02.2011 to 27.02.2011.
- **11.** UGC sponsored National Conference on "Theoretical Biology and Biomathematics (NCTBB 2010)" in Centre for Mathematical Biology and Ecology, Department of Mathematics, Jadavpur University and the Biomathematical Society of India, 15.12.2010 to 16.12.2010.
- International Conference on "Toxicology, Environmental and Occupational Health" in Society of Toxicology (ICTEOH & 25<sup>th</sup> STOX), Lucknow, U.P. India, 14.11.2007 to 17.11.2007.