

CURRICULUM VITAE

Nripendranath Mandal, Ph.D.



PERSONAL:

Born : 14th January, 1959, Kantagore, Bankura, West Bengal, India
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EDUCATION:

1990	Ph.D. Biochemistry	Indian Institute of Chemical Biology University of Calcutta
1982	MSc. Biochemistry	University College of Science, University of Calcutta
1980	BSc. Chemistry (Hons) Physics & Math	Ram Krishna Mission Residential College Narendrapur, University of Calcutta

RESEARCH EXPERIENCES: 33 years 02 month 23 days (up to April 2018)

RESEARCH EXPERIENCES AS FACULTY: 20 years 11 months 19 days (up to April 2018)

July 01, 2014 to Present (**03yrs 10months 00days**): Professor, Bose Institute, Division of Molecular Medicine, Kolkata-700054, India.
May 14, 2008 to June 30, 2014 (**06yrs 01months 18days**): Associate Professor, Bose Institute, Division of Molecular Medicine, Kolkata-700054, India.
Dec 22, 2005 to May 13, 2008 (**02yrs 04months 23days**): Assistant Professor, Bose Institute, Immunotechnology Section, Kolkata-700054, India.
May 14, 1997 to Dec' 21, 2005 (**08yrs 07months 08days**): Senior Lecturer, Bose Institute, Immunotechnology Section, Kolkata-700054, India.

POST DOCTORAL RESEARCH EXPERIENCES: 07 years 01 months 04 days

June 27, 1994 to August 31, 1996 (**02yrs 02months 04 days**): Postdoctoral Trainee (NIH), **St. Louis University Health Sciences Centre**, Dept. of Molecular Microbiology & Immunology, St. Louis, MO 63104, USA.
November 02, 1992 to May 31, 1994 (**01yrs 06months 29 days**): Research Associate, **North Carolina State University**, Dept. of Biochemistry, Raleigh, NC 27695, USA
June 30, 1989 to October 31, 1992 (**03yrs 04months 01 day**): Postdoctoral Associate, **Massachusetts Institute of Technology**, Dept. of Biology, Cambridge, MA 02139 USA

PRE DOCTORAL RESEARCH EXPERIENCES: 05 years 02 months

March 14, 1984 to March 31, 1989 Indian Institute of Chemical Biology, Calcutta 700 032

FIELD OF EXPERTISE:

Biochemistry/ Biotechnology/ Molecular Medicine/ Disease Biology

CURRENT RESEARCH INTEREST:

- Development of molecular and natural medicine to combat non-communicable diseases, including cancer and amelioration from iron-overload-induced hepatotoxicity
- Molecular approach to control White Spot Disease caused by White Spot Syndrome Virus in marine shrimp aquaculture industry

BRIEF ACHIEVEMENTS FROM CURRENT RESEARCH:

Research program has been conducted in the field of **Medical Biotechnology** and **Marine Biotechnology** for disease management in human system and aquatic organism.

Research output from the **Medical Biotechnology** program suggested the development of better and safer drug using natural resources against ROS-induced various degenerative diseases like cancer while avoiding the detrimental side effects of conventional therapies involving synthetic drugs. Out of the explored **45** medicinal plants/algae/lichen for potent antioxidative and free radical scavenging efficacies (**54 publications**), among which **14** are safe and orally-administrable drug to release iron in iron-overload-induced hepatotoxic condition (**17 publications**). Moreover, among these, **12** have shown *in vitro* anticancer effects in various cancer cell lines by inducing apoptosis and/or regulation of cell cycle, while being nontoxic to the normal cells (**13 publications**). For the first time, it has been shown a lichen extract as a better and safer drug against breast cancer where its individual phytochemicals lost this selectivity and was highly appreciated in **9** different news media. Among five purified compounds isolated for the first time from the bark of *Spondias pinnata*, SPE4, SPE3 and SPW1 are the most potent antioxidants, iron chelators and have potential anticancer property. Whereas, SPE2 is a **novel compound** and has been shown to have anti-inflammatory potentials. Additionally, through multivariate analysis from case control study, has shown that ratio of different apolipoproteins and LDL particle size along with distribution of ABO blood group are potent biomarkers of CHD among Asian Indian population in Eastern part of India. It is also found that the association of E4 allele with CAD and the ratio of anti- to pro-inflammatory cytokine with Acute Myocardial Infarction. From the prevention point of view these observations will play a pivotal role to develop biometric chip for early prediction of CHD (**5 publications**).

Aquaculture of marine giant black tiger shrimp *Penaeus monodon*, a globally profitable industry, has suffered relentless destruction due to White spot disease caused by White Spot Syndrome Virus (WSSV). For the first time, thirteen DNA markers (71 bp, 457 bp, 773 bp, 299 bp, 262 bp, 442 bp, 236 bp, 848 bp, 402 bp, 279 bp, 244 bp, 213 bp and 172 bp) have been developed to identify disease resistant and disease susceptible population of *P. monodon* from research program of **Marine Biotechnology (11 publications, patent taken in 7 countries)**. Practical utility of these DNA markers have been tested by WSSV challenge experiment and found ~103 fold higher WSSV propagation among disease susceptible whereas greater survivability among disease resistant population in shrimp. All these DNA markers will be useful to develop Specific Pathogen Resistant (SPR) shrimp through Marker Assisted Selection (MAS) of breeding program for disease free shrimp Aquaculture Industry.

DETAIL PUBLICATIONS:

Total publication: 160 (a) Peer-reviewed Journals: 87; (b) Monograph/Book Published: 4; (c) Patents taken: 7; (d) Sequence submitted at NCBI database: 8; (e) Publication in news media: 9; (f) Abstract Published: 45

(a) PUBLISHED IN PEER-REVIEWED JOURNALS: (TOTAL CITATIONS: 1822 h-index = 20, CUMULATIVE IMPACT FACTOR = 189.921)

1. Shendge, A. K., Basu, T., Panja, S., Chaudhuri, D. and **Mandal, N. (2018)** An ellagic acid isolated from *Clerodendrum viscosum* leaves ameliorates iron-overload induced hepatotoxicity in Swiss albino mice through inhibition of oxidative stress and the apoptotic pathway. *Biomedicine & Pharmacotherapy (In Press)* (**Impact factor: 3.457**)
2. Gupta, G., Das, A., Lee, S. W., Ryu, J. Y., Lee, J., Nagesh, N., **Mandal, N.** and Lee, C. Y. (2018) BODIPY-based Ir (III) rectangles containing bis-benzimidazole ligands with highly selective toxicity obtained through self-assembly. *Journal of Organometallic Chemistry (In Press)* (**Impact factor: 2.184**)
3. Basu, T., Kumar, B., Shendge, A. K., Panja, S., Chugh, H., Gautam, H. K. and **Mandal, N. (2018)** An Indian Desert Shrub 'Hiran Chabba', *Farsetia Hamiltonii* Royle, Exhibits Potent Antioxidant and Hepatoprotective Effect Against Iron-Overload Induced Liver Toxicity in Swiss Albino Mice. *Current Drug Discoveries and Technologies (In Press)* (**Impact factor: 4.77**)
4. Gupta, G., Das, A., Lee, J., Mandal, N. and Lee, C. Y. (2018) Self-Assembled BODIPY-Based Iridium Metallarectangles: Cytotoxicity and Propensity to Bind Biomolecules. 83: 339–347. DOI: 10.1002/cplu.201800035. *ChemPlusChem* (**Impact factor: 2.797**)
5. Basu, T., Panja, S., Shendge, A. K., Das, A. and **Mandal, N. (2018)** A natural antioxidant, tannic acid mitigates iron-overload induced hepatotoxicity in Swiss albino mice through ROS regulation. 33:603–618. DOI: 10.1002/tox.22549. *Environmental Toxicology* (**Impact factor: 2.937**)
6. Debnath, R. P., **Mandal, N.** and Rout, J. (2018) Phytochemical screening of macrolichens *Acroscyphus sphaerophoroides* and *Dirinaria consimilis* from North East India for antioxidant and antibacterial activities. E-ISSN: 2456-0251, 190-196. *Cryptogam Biodiversity and Assessment*
7. Gupta, G., Das, A., Panja, S., Ryu, J. Y., Lee, J., **Mandal, N.** and Lee, C. Y. (2017) Self-assembly of novel thiophene-based BODIPY Ru(II) rectangles: Potential antiproliferative agents selective against cancer cells. *Chemistry A European Journal* 23:17199–17203. DOI: 10.1002/chem.201704368 (**Impact factor: 5.317**)
8. Shendge, A. K., Basu, T., Sinha, G. P. and **Mandal, N. (2017)** Assessment of the antioxidant activity and phytochemical analysis of a lichen, *Everniastrum cirrhatum* (Fr.) Hale ex. Sipman. *World Journal of Pharmacy and Pharmaceutical Sciences* 6: 1440-1464 DOI: 10.20959/wjpps20179-10056 (**Impact factor: 6.647**)
9. Gupta, G., Das, A., Park, K. C., Tron, A., Kim, H., Mun, J., **Mandal, N.**, Chi, K. W., Lee, C. Y. (2017) Self - assembled novel BODIPY - based Pd supramolecules and their cellular localization. *Inorganic Chemistry* 56:4615–4621 DOI: 10.1021/acs.inorgchem.7b00260 (**Impact factor: 4.820**)
10. Basu, T., Mallik, A. and **Mandal, N. (2017)** Evolving importance of anticancer research using herbal medicine: A scientometric analysis. *Scientometrics* DOI 10.1007/s11192-016-2223-8 (**Impact factor: 2.084**)
11. Basu, T., Panja, S., Ghate, N. B., Chaudhuri, D., and **Mandal, N. (2017)** Antioxidant and antiproliferative effects of different solvent fractions from *Terminalia belerica* Roxb. fruit on various cancer cells. *Cytotechnology* 69:201–216. DOI 10.1007/s10616-016-0051-6 (**Impact factor: 1.864**)

12. Shendge, A. K., Basu, T., Chaudhuri, D., Panja, S. and **Mandal, N. (2017)** *In vitro* antioxidant and antiproliferative activities of various solvent fractions from *Clerodendrum viscosum* leaves. *Pharmacognosy magazine* 13:344-353. DOI 10.4103/pm.pm_395_16 **(Impact factor: 1.279)**
13. Chaudhuri, D., Ghate, N. B., Panja, S., Basu, T., Shendge, A. K. and **Mandal, N. (2016)** Glycoside rich fraction from *Spondias pinnata* bark ameliorate iron overload induced oxidative stress and hepatic damage in Swiss albino mice. *BMC Complementary and Alternative Medicine* 16: 262. DOI 10.1186/s12906-016-1244-4 **(Impact factor: 2.94)**
14. Chaudhuri, D., Ghate, N. B., Panja, S., and **Mandal, N. (2016)** Role of phenolics from *Spondias pinnata* bark in amelioration of iron overload induced hepatic damage in Swiss albino mice. *BMC Pharmacology and Toxicology* 17: 34. DOI 10.1186/s40360-016-0077-6 **(Impact factor: 2.03)**
15. Panja, S., Ghate, N. B. and **Mandal, N. (2016)** A microalga, *Euglena tuba* induces apoptosis and suppresses metastasis in human lung and breast carcinoma cells through ROS-mediated regulation of MAPKs. *Cancer Cell International* 16: 51. DOI: 10.1186/s12935-016-0330-5 **(Impact factor: 3.97; Citation: 1)**
16. Gupta, G., Das, A., Ghate, N. B., Kim, T. H., Ryu, J. Y., Lee, J., **Mandal, N.** and Lee, C. Y. **(2016)** Novel BODIPY-based Ru (II) and Ir (III) Metalla-rectangles: Cellular Localization of Compounds and Their Antiproliferative Activities. *Chemical Communications* 52, 4274 – 4277. DOI:10.1039/C6CC00046K **(Impact factor: 6.567; Citation: 3)**
17. Ghate, N. B., Das, A., Chaudhuri, D., Panja, S. and **Mandal, N. (2016)** Sundew plant, a potential source of anti-inflammatory agents, selectively induces G2/M arrest and apoptosis in MCF-7 cells through upregulation of p53 and Bax/Bcl-2 ratio. *Nature-Cell Death Discovery* 2, 15062. DOI:10.1038/cddiscovery.2015.62 **(Citation: 3)**
18. Panja, S., Ghate, N. B., Chaudhuri, D. and **Mandal, N. (2016)** Antioxidant and free radical scavenging activity of North Eastern edible red alga, *Lemania fluviatilis*. *Proceedings of International Conference on Innovative Approaches in Applied Sciences and Technologies (iCiAsT-2016)* February 01-05, 2016
19. Chaudhuri, D., Ghate, N. B., Panja, S., Das, A. and **Mandal, N. (2015)** Wild Edible Fruit of *Prunus nepalensis* Ser. (Steud), a Potential Source of Antioxidants, Ameliorates Iron Overload-Induced Hepatotoxicity and Liver Fibrosis in Mice. *PLoS ONE* 10(12): e0144280. DOI:10.1371/journal.pone.0144280 **(Impact factor: 3.057; Citation: 2)**
20. Chakrabarty, U., Dutta, S., Mallik, A., Mondal, D. and **Mandal, N. (2015)** Identification and characterisation of microsatellite DNA markers in order to recognise the WSSV susceptible populations of marine giant black tiger shrimp, *Penaeus monodon*. *Veterinary Research* 46: 110. DOI: 10.1186/s13567-015-0248-2. **(Impact factor: 2.982; Citation: 1)**
21. Ghate, N. B., Chaudhuri, D., Das, A., Panja, S., and **Mandal, N. (2015)** An Antioxidant Extract of the Insectivorous Plant *Drosera burmannii* Vahl. Alleviates Iron-Induced Oxidative Stress and Hepatic Injury in Mice. *PLoS ONE* 10(5): e0128221. DOI:10.1371/journal.pone.0128221 **(Impact factor: 3.057; Citation: 4)**
22. Sarkar, R., Hazra, B. and **Mandal, N. (2015)** Amelioration of iron overload induced liver toxicity by a potent antioxidant and iron chelator, *Embllica officinalis* Gaertn. *Toxicology and Industrial Health* 31 (7): 656 – 669. DOI: 10.1177/0748233713483195 **(Impact factor: 1.786; Citation: 5)**

23. Das, A., Chaudhuri, D., Ghate, N. B., Panja, S., Chatterjee, A. and **Mandal, N. (2015)** Protective effect of *Clerodendrum colebrookianum* leaves against Iron-induced Oxidative Stress and Hepatotoxicity in Swiss albino mice. *Indian Journal of Experimental Biology* 53:281-291 (**Impact factor: 1.35; Citation: 5**)
24. Chaudhuri, D., Ghate N. B., Singh, S.S. and **Mandal, N. (2015)** Methyl gallate isolated from *Spondias pinnata* exhibits anticancer activity against human glioblastoma by induction of apoptosis and sustained extracellular signal-regulated kinase 1/2 activation *Pharmacognosy magazine* 11:269-276. DOI: 10.4103/0973-1296.153078. (**Impact factor: 1.279; Citation: 4**)
25. Ghate, N. B., Chaudhuri, D., Panja, S. and **Mandal, N. (2015)** *Nerium indicum* leaf alleviates iron-induced oxidative stress and hepatic injury in mice. *Pharmaceutical Biology* Published online January 22, DOI:10.3109/13880209.2014.959612 (**Impact factor: 1.546; Citation: 3**)
26. Hazra, B., Sarkar, R., Chaudhuri, D., Ghate N. B., Panja, S. and **Mandal, N. (2015)** Attenuation of iron overload induced liver toxicity by *Hemidesmus indicus* root in Swiss albino mice. *International Journal of Pharma and Bio Sciences* 6(1): 354-364 (**Impact factor: 6.268**)
27. Dutta, S., Chakrabarty, U., Mallik, A. and **Mandal, N. (2015)** White spot syndrome virus (WSSV) prevalence associated with disease resistance among wild populations of black tiger shrimp, *Penaeus monodon* (Fabricius). *Aquaculture Research*. 46: 453–461. DOI: 10.1111/are.12193 (**Impact factor: 1.376; Citation: 11**)
28. Ghate, N. B., Chaudhuri, D., Panja, S., Basu Mallik, T., Das, A. and **Mandal, N. (2014)** Antioxidants from *Clerodendrum viscosum* leaf play a role in anticancer activity against brain cancer. *Journal of Cancer Science & Therapy* DOI: <http://dx.doi.org/10.4172/1948-5956.S1.034> (**Impact factor: 3.09**)
29. Chaudhuri, D., Ghate, N. B., Panja, S., Basu Mallik, T. and **Mandal, N. (2014)** HPLC screening of *Clerodendrum viscosum* leaf extract show possible phytochemical responsible for antioxidant and anticancer activities. *Journal of Cancer Science & Therapy* DOI: <http://dx.doi.org/10.4172/1948-5956.S1.038> (**Impact factor: 3.09**)
30. Panja, S., Ghate, N. B., Chaudhuri, D. and **Mandal, N. (2014)** Antioxidant from Indigenous medicinal plants inhibit proliferation of Ascites cancer cell. *Journal of Cancer Science & Therapy* DOI: <http://dx.doi.org/10.4172/1948-5956.S1.038> (**Impact factor: 3.09**)
31. Panja, S., Chaudhuri, D., Ghate, N. B. and **Mandal, N. (2014)** Phytochemical profile of a microalgae *Euglena tuba* and its hepatoprotective effect against iron-induced liver damage in Swiss albino mice. *Journal of Applied Microbiology* 117, 1773-1786 DOI:10.1111/jam.12643 (**Impact factor: 2.156; Citation: 3**)
32. Chakrabarty, U., Dutta, S., Mallik, A. and **Mandal, N. (2014)** White spot syndrome virus (WSSV) and prevalence of disease resistance in a commercially cultured population of *Penaeus monodon* Fabricius, 1798 (Decapoda, Dendrobranchiata). *Crustaceana* 87 (14), 1593 – 1605 DOI:10.1163/15685403-00003382 (**Impact factor: 0.664**)
33. Sarkar, R., Ghate N. B. and **Mandal, N. (2014)** Antioxidant activity of *Tinospora cordifolia* extract depends on the solvent system. *Journal of Computer Science & Systems Biology* 7:5 DOI: <http://dx.doi.org/10.4172/0974-7230.S1.008> (**Impact factor: 1.59**)

34. Panja, S., Chaudhuri, D., Ghate N. B., Ha, L. M. and **Mandal, N. (2014)** *In vitro* assessment of phytochemicals, antioxidant and DNA protective potential of wild edible fruit *Elaeagnus latifolia* Linn. *Fruits* 69, 303–314. DOI: 10.1051/fruits/2014019 (**Impact factor: 0.904; Citation: 2**)
35. Mallik, A, Chakrabarty, U., Dutta, S., Mondal, D. and **Mandal, N. (2014)** Study on the distribution of disease resistant shrimp identified by DNA markers in respect to WSSV infection in different seasons along the entire East coast of India aiming to prevent white spot disease in *Penaeus monodon*. *Transboundary and Emerging Diseases* DOI: 10.1111/tbed.12230 (**Impact factor: 2.714; Citation: 2**)
36. Chaudhuri, D., Ghate N. B., Deb, S., Panja, S., Sarkar, R., Rout, J. and **Mandal, N. (2014)** Assessment of the phytochemical constituents and antioxidant activity of a bloom forming algae *Euglena tuba*. *BMC-Biological Research* 47:24 DOI: 10.1186/0717-6287-47-24 (**Impact factor: 1.328; Citation: 5**)
37. Biswas, S., Ghosal, P. K. and **Mandal, N. (2014)** Synergistic effect of anti and pro-inflammatory cytokine genes and their promoter polymorphism with ST-elevation of myocardial infarction. *Gene* 544(2): 145-151 DOI: 10.1016/j.gene.2014.04.065 (**Impact factor: 2.319; Citation: 15**)
38. Chakrabarty, U., Mallik, A., Mondal, D., Dutta, S. and **Mandal, N. (2014)** Assessment of WSSV prevalence and distribution of disease resistant shrimp among the wild population of *Penaeus monodon* along the West coast of India. *Journal of Invertebrate Pathology* 119: 12-18 DOI: 10.1016/j.jip.2014.03.005 (**Impact factor: 2.794; Citation: 5**)
39. Mallik, A. and **Mandal, N. (2014)** Bibliometric analysis of global publication output and collaboration structure study in microRNA research. *Scientometrics* 98 (3): 2011 – 2037. DOI 10.1007/s11192-013-1128-z (**Impact factor: 2.084; Citation: 10**)
40. Ghate N. B., Hazra, B., Sarkar, R., Chaudhuri, D. and **Mandal, N. (2014)** Alteration of Bax/Bcl-2 ratio contributes to *Terminalia bellerica*-induced apoptosis in human lung and breast carcinoma. *In Vitro Cellular & Developmental Biology - Animal* 50 (6): 527-537 DOI: 10.1007/s11626-013-9726-x (**Impact factor: 0.971; Citation: 15**)
41. Ghate N. B., Hazra, B., Sarkar, R. and **Mandal, N. (2014)** *In vitro* anticancer activity of *Spondias pinnata* bark on human lung and breast carcinoma. *Cytotechnology* 66: 209-218 DOI: 10.1007/s10616-013-9553-7 (**Impact factor: 1.864; Citation: 17**)
42. Ghate, N. B., Hazra, B., Sarkar, R. and **Mandal, N. (2014)** Heartwood Extract of *Acacia catechu* Induces Apoptosis in Human Breast Carcinoma by Altering Bax/Bcl-2 ratio. *Pharmacognosy magazine* 10: 27-33. DOI: 10.4103/0973-1296.126654. (**Impact factor: 1.279; Citation: 17**)
43. Das, A., Chaudhuri, D., Ghate, N. B., Chatterjee, A. and **Mandal, N. (2014)** Phytochemical Analysis, Antioxidant and Anticancer Potential of Leaf Extracts from Edible Greater Yam, *Dioscorea alata* L., from North-East India. *International Journal of Phytopharmacology* 5(2): 109-119 (**Impact factor: 1.02; Citation: 3**)
44. Dutta, S., Biswas, S., Mukherjee, K., Chakrabarty, U., Mallik, A. and **Mandal, N. (2014)** Identification of RAPD-SCAR marker linked to WSSV resistance in populations of giant black tiger shrimp, *Penaeus monodon*, Fabricius. *Journal of Fish Diseases* 37(5): 471-480 DOI:10.1111/jfd.12128 (**Impact factor: 2.053; Citation: 7**)
45. Ghate, N. B., Chaudhuri, D., Sarkar, R. Sajem, A.L., Panja, S., Rout, J. and **Mandal, N. (2013)** An antioxidant extract of tropical lichen, *Parmotrema reticulatum*, induces cell

cycle arrest and apoptosis in breast carcinoma cell line MCF-7. *PLoS ONE* 8(12): e82293. DOI:10.1371/journal.pone.0082293 (**Impact factor: 3.057; Citation: 26**)

46. Ha, L. M., Phuong, N. T., Yen, N. T. H., Huong, L. M., and **Mandal, N. (2013)** Antioxidant activity and chemical constituents from *Iris japonica* Thunb. *Tạp Chi Dược Liệu* 18: 381-385
47. Biswas, S., Ghoshal, P. K., Halder, B., Ganguly, K., DasBiswas, A. and **Mandal, N. (2013)** Apolipoproteins AI/B/E gene polymorphism and their plasma levels in patients with coronary artery disease in tertiary care-centre of Eastern India. *Indian Heart Journal* 65: 658 – 665. DOI: 10.1016/j.ihj.2013.10.003 (**Impact factor: 0.464; Citation: 6**)
48. Hazra, B., Sarkar, R., Ghate N. B., Chaudhuri, D. and **Mandal, N. (2013)** Study on the protective effects of 'Katha' (Heartwood extract of *Acacia catechu*) in iron-overload-induced liver damage. *Journal of Environmental Pathology, Toxicology and Oncology* DOI: 10.1615/JEnvironPatholToxicolOncol.2013007156 (**Impact factor: 1.246; Citation: 3**)
49. Das, A., Chaudhuri, D., Ghate, N. B., Chatterjee, A. and **Mandal, N. (2013)** Comparative Assessment of Phytochemicals and Antioxidant Potential of Methanolic and Aqueous Extracts of *Clerodendrum colebrookianum* Walp. leaf from North-East India. *International Journal of Pharmacy and Pharmaceutical Sciences* 5: 420 – 427 (**Impact factor: 0.91; Citation: 3**)
50. Biswas, S.; Ghosal, P. K.; Halder, B. and **Mandal, N. (2013)** Distribution of ABO Blood Group and Major Cardiovascular Risk Factors with Coronary Heart Disease. *BioMed Research International* vol. 2013, Article ID 782941 DOI:10.1155/2013/782941 (**Impact factor: 2.134; Citation: 15**)
51. Dastidar, P. G., Mallik, A. and **Mandal, N. (2013)** Contribution of shrimp disease research to the development of the shrimp aquaculture industry: an analysis of the research and innovation structure across the countries. *Scientometrics* 97 (3): 659 – 674. DOI: 10.1007/s11192-013-0977-9 (**Impact factor: 2.084; Citation: 14**)
52. Roy, S., Hazra, B., **Mandal, N.** and Chaudhuri, T.K. (2013) Assessment of the Antioxidant and Free Radical Scavenging Activities of Methanolic Extract of *Diplazium esculentum*. *International Journal of Food Properties* 16(6): 1351-1370, DOI: 10.1080/10942912.2011.587382 (**Impact factor: 1.586; Citation: 7**)
53. Dutta S., Chakrabarty U., Mallik A. and **Mandal N. (2013)** Experimental evidence for WSSV susceptibility linked to a microsatellite DNA marker in Giant Black Tiger Shrimp, *Penaeus monodon* (Fabricius). *Journal of Fish Diseases* 36 (6): 593 – 597. DOI:10.1111/jfd.12006 (**Impact factor: 2.053, Citation: 9**)
54. Sarkar, R., Hazra, B. and **Mandal, N. (2013)** Free radical scavenging and hepatoprotective potential of *Cajanus cajan* leaf extract. *Indian Journal of Experimental Biology* 51: 165 - 173 (**Impact factor: 1.34; Citation: 16**)
55. Hazra, B., Sarkar, R. and **Mandal, N. (2013)** *Spondias pinnata* stem bark extract lessens iron overloaded liver toxicity due to hemosiderosis in Swiss albino mice. *Annals of Hepatology* 12: 123-129 (**Impact factor: 2.193, Citation: 5**)
56. Ghate, N. B., Chaudhuri, D. and **Mandal, N. (2013)** In vitro assessment of *Tinospora cordifolia* stem for its antioxidant, free radical scavenging and DNA protective potentials. *International Journal of Pharma and Bio Sciences* 4(1): 373 - 388 (**Impact factor: 6.268; Citation: 2**)

57. Dey, P., Chaudhuri, D., Chaudhuri, T.K. and **Mandal, N. (2012)** Comparative Assessment of The Antioxidant Activity and Free Radical Scavenging Potential of Different Parts of *Nerium indicum*. *International Journal of phytomedicine* 4(1): 54-69, DOI: 10.5138/ijpm.v4i1.505 (**Impact factor: 1.23; Citation: 19**)
58. Hazra, B., Sarkar, R. and **Mandal, N. (2012)** Protection of *Terminalia bellerica* Roxb. Against Iron Overload Induced Liver Toxicity: An Account of Its Reducing and Iron Chelating Capacity. *American Journal of Pharmacology and Toxicology* 7 (3): 109-122, DOI: 10.3844/ajptsp.2012.109.122 (**Impact factor: 0.21; Citation: 8**)
59. Chaudhuri, D., Ghate, N. B., Sarkar, R. and **Mandal, N. (2012)** Phytochemical Analysis and Evaluation of Antioxidant and Free Radical Scavenging Activity of *Withania somnifera* Root. *Asian Journal of Pharmaceutical and Clinical Research* 5 (4): 193-199 (**Impact factor: 0.51, Citation: 23**)
60. Sarkar, R., Hazra, B. and **Mandal, N. (2012)** Reducing power and iron chelating property of *Terminalia chebula* (Retz.) alleviates iron induced liver toxicity in mice. *BMC Complementary and Alternative Medicine* 12: 144. DOI:10.1186/1472-6882-12-144 (**Impact factor: 2.94; Citation: 14**)
61. Sarkar, R. and **Mandal, N. (2012)** Study of iron chelating and DNA protective activities in hydroalcoholic extract of Indian medicinal plants. *International Journal of Pharma and Bio Sciences* 3(4): 282-291 (**Impact factor: 6.268; Citation: 3**)
62. Sarkar, R., Hazra, B. and **Mandal, N. (2012)** Hepatoprotective potential of *Caesalpinia crista* against iron overload induced liver toxicity in mice. *Evidence-based Complementary and Alternative Medicine* Volume 2012, Article ID 896341, 9 pages DOI:10.1155/2012/896341 (**Impact factor: 1.931; Citation: 15**)
63. Dey, P., Chaudhuri, D., Tamang, S., Chaudhuri, T.K. and **Mandal, N. (2012)** *In vitro* antioxidant and free radical scavenging potential of *Clerodendrum viscosum*. *International Journal of Pharma and Bio Sciences* 3: 454–471 (**Impact factor: 6.268; Citation: 13**)
64. Das, A., Chaudhuri, D., **Mandal, N.** and Chatterjee A. (2012) Study of the antioxidant and the Reactive Oxygen Species Scavenging activity of the edible tuber of “Greater Yam” (*Dioscorea alata*) from North-East India. *Asian Journal of Pharmaceutical and Clinical Research* 5(3): 74-84 (**Impact factor: 0.51; Citation: 12**)
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2. Hazra B., Sarkar R., Biswas S., and **Mandal N.** (2014) Comparative Study of the Antioxidant and Reactive Oxygen Species Scavenging Properties in the Extracts of the Fruits of *Terminalia chebula*, *Terminalia belerica*, and *Emblica officinalis*: In Recent Advances in Plant-Based, Traditional, and Natural Medicines (Edited by Subramayam Vemulpad and Joanne Jamie). Apple Academic Press, Canada & CRC Press, Taylor & Francis Group, Florida, USA, pp 181-213
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- Dyson, M.R., Lee, C.P., **Mandal, N.**, Seong, B.L., Varshney, U. and RajBhandary, U.L. (1993) Identity of a prokaryotic initiator tRNA:In The Translational Apparatus, (Edited by K.H. Nierhaus et al.) Plenum Press, New York, pp 23-33. DOI: 10.1007/978-1-4615-2407-6_3 ISBN No: 978-1-4615-2407-6 (**Citation: 1**)

(c) PATENTS TAKEN:

Title: A microsatellite DNA marker used for identifying disease resistant populations of *Penaeus monodon*

Applicants: Department of Biotechnology & Bose Institute

Inventors: Mandal, Nripendranath and Mukherjee, Kuntal

Sl. No.	Country	Patent Application No.	Status
1.	Singapore	200605884-6	Filed on March 22, 2006; Granted on September 30, 2009
2.	Malaysia	PI 20064147	Filed on August 14, 2006; Granted on May 31, 2012
3.	Philippines	1-2006-501898	Filed on September 25, 2006; Granted on October 15, 2012
4.	Indonesia	ID P0028730	Filed on March 22, 2006, Granted on July 12, 2011
5.	Vietnam	1-2007-00569	Filed on March 22, 2006, Granted on February 29, 2016
6.	Thailand	0601004023	Filed on August 23, 2006
7.	India	1054/KOL/05	Filed on November 21, 2005

(d). SEQUENCE SUBMITTED AT NCBI DATABASE:

- Mandal, N.** and Mukherjee, K. (2013) DNA markers to identify disease resistant population of *Penaeus monodon*. Definition: *Penaeus monodon* clone pm502r RAPD marker genomic sequence. **Accession No: KC461828**. INV 21-APR-2013
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1. The Times of India: <http://timesofindia.indiatimes.com/home/science/Northeastern-lichens-may-yield-drug-against-breast-cancer/articleshow/30802564.cms>
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1. Panja S., Shendge A. K., Basu T. and **Mandal N.** (2018) Importance of Lichen to control non-communicable diseases. Abstract in the National Conference on “Current Developments and Next Generation Lichenology” held on January 27 – 28, 2018 at NBRI, Lucknow, India organized by Indian Lichenological Society (ILS) NBRI, Lucknow
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3. **Mandal N.**, Ghate N. B., Chaudhuri D., Das A., Panja S., Basu T. and Shendge A. K. (2017) Drug development from natural resources: An insectivorous plant, *Drosera burmannii*, is a source of better medicine to combat breast cancer by altering tumor – microenvironment. Abstract in the “3rd International Conference and Expo on Herbal and Alternative Medicine” held on September 01-02, 2017 at Park Inn by Radisson, London, UK Organized by Allied Academies
4. Chaudhuri D., Ghate N. B., Panja S. and **Mandal N.** (2017) Phytochemicals from *Spondias pinnata* bark alleviate iron overload induced oxidative stress and hepatotoxicity in Swiss albino mice. Abstract in the “3rd International Symposium on Perspective of Cell

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6. Basu T., Panja S. Ghate N. B., Chaudhuri D. and **Mandal N.** (2017) Evaluation of the antioxidant and anticancer potentials of polar solvent fractions from *Terminalia belerica* Roxb. Fruits: A natural source for anticancer drug. Abstract in the “3rd International Symposium on Perspective of Cell Signaling and Molecular Medicine” held on January 8-10, 2017 at Bose Institute, Kolkata organized by Division of Molecular Medicine, Bose Institute, Kolkata, India
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9. Mondal D., Dutta S., Chakrabarty U., Mallik A. and **Mandal N.** (2017) Development and characterization of microsatellite DNA markers linked to disease resistance or susceptibility in the population of a marine shrimp, *Penaeus monodon* Abstract in the “3rd International Symposium on Perspective of Cell Signaling and Molecular Medicine” held on January 8-10, 2017 at Bose Institute, Kolkata organized by Division of Molecular Medicine, Bose Institute, Kolkata, India
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13. Chakrabarty U., Dutta S., Mallik A., Mondal D., Mondal V. and **Mandal N.**, (2016) White spot syndrome virus (WSSV) prevalence and distribution of white spot disease (WSD) resistant shrimp among the entire coastal area of India. Abstract in the International Conference on "Aquatic Resources and Sustainable Management", held on February 17 - 19, 2016 at Science City, Kolkata organized by Central Calcutta Science and Culture Organization for Youth (CCSCYOY), Kolkata, India
14. **Mandal N.**, Dutta S., Chakrabarty U., Mallik A., Mondal D. and Mondal V. (2016) Role of DNA markers to control white spot disease (WSD) in marine shrimp aquaculture. Abstract in the International Conference on "Aquatic Resources and Sustainable Management", held on February 17 - 19, 2016 at Science City, Kolkata organized by Central Calcutta Science and Culture Organization for Youth (CCSCYOY), Kolkata, India
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16. Ghate N. B., Chaudhuri D., Das A., Panja S., Basu Mallik T., Shendge A.K. and **Mandal N.** (2016) Sundew plant: Source for drug against multiple non-communicable diseases. Abstract in the International Conference on "Innovative Approaches in Applied Sciences and Technologies", held on February 01-05, 2016 at Kasetart University, Bangkok, Thailand organized by Scientific Educational Research Society (SERS), Meerut, India and Kasetart University, Bangkok, Thailand
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18. Ghate N. B., Chaudhuri D. and **Mandal N.** (2015) A tropical lichen, *Parmotrema reticulatum*, could be a source for better medicine to combat cancer and inflammatory diseases. Abstract in the National Conference on "Cryptogam Research in India: Progress and Prospects", held on September 28 – 29, 2015 at NBRI, Lucknow, India organized by Indian Lichenological Society (ILS) NBRI, Lucknow
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21. Chakrabarty U., Dutta S., Mallik A., Mondal D. and **Mandal N.** (2014) Estimation of WSSV infection with distribution of disease resistant population of marine shrimp (*Penaeus monodon*) along the entire coastal areas of India. Abstract in the "4th International Conference of the World Science Congress", held on December 16 - 18, 2014 at Jadavpur University, Kolkata organized by Jadavpur University, Kolkata, India

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26. **Mandal N.**, Sarkar R., Ghate N. B., Chaudhuri D., Panja S., Das A. (2014) Present scenario of Medical Biotechnology in India: Importance of Medicinal plants to control iron-overload-induced hepatotoxicity and cancer. Abstract in the National symposium on "Emerging trends in Biotechnology: Present scenario and future dimensions", held on March 29 – 31, 2014 at Utkal University, Odisha organized by Post Graduate Dept. of Biotechnology, Utkal University, Odisha
27. Mondal D., Dutta S., Chakrabarty U., Mallik A. and **Mandal N.** (2014) Quantitative estimation of WSSV propagation among disease resistant and disease susceptible population of marine shrimp (*Penaeus monodon*) Abstract in the National Conference on "Current trends in Life Sciences research and challenges ahead", held on February 28 – March 02, 2014 at Sambalpur University organized by Dept. of Life Sciences, Sambalpur University, Orissa
28. Dutta S., Chakrabarty U., Mallik A., Mondal D. and **Mandal N.** (2014) Importance of various DNA markers for the development of specific pathogen resistant (SPR) *Penaeus monodon* Abstract in the National Conference on "Current trends in Life Sciences research and challenges ahead", held on February 28 – March 02, 2014 at Sambalpur University organized by Dept. of Life Sciences, Sambalpur University, Orissa
29. **Mandal N.**, Mallik A. (2013) Importance of patents in scientific research: A case study of microRNA research Abstract in the International conference on "Global IPR System and WTO Issues", held on November 16-17, 2013 at CCS University organized by Dept. of Biotechnology, Ch. Charan Singh University, Meerut (UP) India
30. **Mandal N.**, Hazra B., Sarkar R., Ghate N. B., Chaudhuri D. (2013) Iron chelation by *Terminlia chebula*: New remedies from an age-old plant Abstract in the International conference on "Biologically active substances and materials: fundamental and applied problems of production and application", held on May 27-June 01, 2013 at Crimea, Novy Svet, Ukraine organized by Education-Science Center "Institute of Biology", Taras Shevchenko National University of Kyiv, Ukraine

31. **Mandal N.**, Chakrabarty U., Dutta S., Khatua S., Mallik A. (2012) Importance of DNA markers linked to disease resistance in marine shrimp (*Penaeus monodon*) Abstract in the "BIT's 2nd Annual World Congress of Marine Biotechnology", held on September 20-23, 2012 organized by BIT Congress Inc., Dalian, China
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33. Sarkar R., Hazra B., Ghate N. B., Chaudhuri D. and **Mandal N.** (2012) Study of *Cajanus cajan* leaf extract for antioxidant capacity through ROS scavenging and iron chelating, along with potential anticancer activity Abstract in the "2nd International Symposium on Perspective of Cell Signaling and Molecular Medicine" held on January 8-11, 2012 at Bose Institute, Kolkata organized by Division of Molecular Medicine, Bose Institute, Kolkata, India
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35. Dastidar P. G., Mallik A. and **Mandal N.** (2012) Are Academic Research and Innovation policies sufficient to sustain the challenges of Aquaculture industries? An analysis of research dynamics across the countries Abstract in the "22nd Annual Conference of The International Environmetrics Society on Environmental Challenges facing developed and developing countries in a Globalized World: Quantitative approaches to Comprehensive Solutions", held on January 3-6, 2012 at University of Hyderabad, Gachibowli, Hyderabad, India Organized by CRRAO AIMSCS, UOH Campus and University of Hyderabad, Gachibowli, Hyderabad, India
36. Dutta S., Chakrabarty U., Khatua S., Mallik A. and **Mandal N.** (2011) DNA markers linked to disease resistance in shrimp (*Penaeus monodon*). Abstract in the International symposium on "From innovations in nucleic acids research to regulation of Biological processes", held on December 17-19, 2011 at IISc, Bangalore organized by Department of Microbiology and Molecular Biology, Indian Institute of Science, Bangalore
37. Biswas, S., Hazra, B., Sarkar, R., Dutta, S., Khatua, S., Chakraborty, U., Ghate, N., Mallick, A., and **Mandal, N.** (2011) Importance of Biotechnology to control various diseases in human as well as in aquatic animal. Abstract in Sir J.C. Bose Memorial National Symposium on "Modern Trends in Animal Science Research and Challenges of the Day", held on March 23, 2011 organized by Department of Zoology and Molecular Biology & Genetics, Presidency University, Kolkata
38. **Mandal, N.** (2010). Importance of DNA markers for developing disease free shrimp (*Penaeus monodon*) aquaculture. Abstract in National Symposium on "Parasite Taxonomy, Biodiversity and Fish Health: Environmental Impact", held on March 12- 13, 2010 at Andhra University organized by Department of Zoology, Andhra University, Visakhapatnam, Andhra Pradesh
39. Hazra, B., Sarkar, R., Mandal, S., Biswas, S. and **Mandal, N.** (2008) Study in a comparative basis of antioxidant capacity, free radical scavenging and iron chelation activities of aqueous extracts of three plants, *Terminalia chebula*, *Terminalia belerica* and *Emblica officinalis* Abstract in International Symposium on "Perspective of Cell Signaling

and Molecular Medicine”, held on November 27-29, 2008 at Bose Institute, Kolkata organized by Division of Molecular Medicine, Bose Institute, Kolkata, India

40. Sengupta, M., Samanta, B., Biswas, S. and **Mandal, N.** (2008) Prevalence of white spot syndrome virus (WSSV) in Wild and cultured giant black tiger shrimp (*Penaeus monodon*) in the estuarine and coastal areas of West Bengal, India Abstract in International Symposium on “Perspective of Cell Signaling and Molecular Medicine”, held on November 27-29, 2008 at Bose Institute, Kolkata organized by Division of Molecular Medicine, Bose Institute, Kolkata, India
41. Mukherjee, K.; Biswas, S.; Hazra, B. and **Mandal, N.** (2007) Indian traditional medicine to combat cancer and other related disease. Abstract in “2nd International Symposium on Translational Research: Natural Products and Cancer”, held on December 9-12, 2007 at Lonavala, Mumbai, India organized by The University of Texas, M. D. Anderson Cancer Center, 1515 Holcombe Boulevard, BOX 143, Houston, TX 77030, USA
42. Mukherjee, K. and **Mandal, N.** (2006). Disease resistant microsatellite DNA marker of Giant black tiger shrimp, *Penaeus monodon*. Abstract in National Symposium on “Cross-Talk Between Zoology and Technology”, held on November 16- 17, 2006 at University of North Bengal, Siliguri organized by Department of Zoology, University of North Bengal, Siliguri - 734013, West Bengal
43. Mukherjee, K. and **Mandal, N.** (2006). Sustainability of disease resistant shrimp (*Penaeus monodon*) aquaculture. Abstract in the “4th International Symposium on Biocontrol and Biotechnology”, held on November 27- 29, 2006 , at Lady Doak College, Madurai organized by Department of Zoology and Biotechnology, Madurai, Tamil Nadu, India
44. Mukherjee, K. and **Mandal, N.** (2006). Disease management of Giant black tiger shrimp *Penaeus monodon*. Abstract in National Symposium on “Biomedicine in Aquaculture”, held on March 17- 18, 2006 at Centre for Marine Science and Technology, Marina Campus, Rajakkamanglam - 629 502, Kanyakumari District, Tamil Nadu organized by, Manonamiam Sundaranar University
45. **Mandal, N.** and Ghosh, R.K. (1988). Studies on the transfer RNA molecules coded by vibrio phage ϕ 149. Abstract in “5th annual meeting of The Society of Biological Chemist (India)”, held on New Delhi, India organized by SBC, India

RESEARCH GUIDANCE EXPERIENCES:

Research Guidance/No. of Ph.Ds. awarded:

- (1) Srikanta Jana, Ph. D. awarded **May 07, 2003, JU**
- (2) Kuntal Mukherjee, Ph. D. awarded **November 12, 2008, JU**
- (3) Santanu Biswas, Ph. D. awarded **February 17, 2011, JU**
- (4) Bibhabasu Hazra, Ph. D. awarded **June 27, 2013, JU**
- (5) Rhitajit Sarkar, Ph. D. awarded **January 02, 2015, CU**
- (6) Sourav Dutta, Ph. D. awarded **July 08, 2016, CU**
- (7) Nikhil Baban Ghate, Ph. D. awarded **July 27, 2016, CU**
- (8) Usri Chakrabarty, Ph. D. awarded **August 08, 2016, CU**
- (9) Ajoy Mallik, Ph. D. awarded **October 25, 2016, CU**
- (10) Dipankar Chaudhuri Ph. D. awarded **November 25, 2016, CU**
- (11) Sourav Panja registered for Ph. D. **June 17, 2015, CU**
- (12) Tapasree Basu registered for Ph. D. **June 17, 2015, CU**
- (13) Debabrata Mondal registered for Ph. D. **July 22, 2016, CU**
- (14) Shendge Anil Khushalrao registered for Ph. D. **July 10, 2017, CU**

(15) Abhijit Das registered for Ph. D. **July 10, 2017, CU**

Post-doctoral trainee:

- (1) Dr. Abhishek Das, DBT-PD Fellow, **2014 - 2017**
- (2) Dr. Santanu Biswas, DBT-PD Fellow, **2012**
- (3) Dr. Arnab Ghosh, DBT-PD Fellow **2004**
- (4) Dr. Eliza Chakraborty, DBT-PD Fellow **1998-2000**
- (5) Dr. Selvamani Vijaylingam, DBT-PD Fellow **1999-2000**

Post graduate level:

- (1) Ms. Humaira Ilyas, M. Sc. (Life Science), BI, **2015**
- (2) Mr. Mrinmoy Sinha, M.Sc. (Molecular Biology & Biotechnology), Kalyani U, **2014**
- (3) Mr. Himangshu Pathak, B.Tech. (Biotechnology), Nagaland U, **2011**
- (4) Mr. Devmurari Prakashkumar Ashokbhai, M. Sc. (Microbiology), Sarder Patel U, **2009**
- (5) Mr. Paul Tseng, M. Sc. (Biotechnology), Allahbad Agriculture U, **2007**
- (6) Mr. Dias Arthur Gonsalino, M. Sc. (Biotechnology), Allahbad Agriculture U, **2007**
- (7) Mr. Pavan Kumar Annam, M.F.Sc. (Fish Genetics and Biotech), CIFE, **2005-2006**
- (8) Mr. M. Sekar, M. F. Sc. (Fish Genetics and Biotech), CIFE, **2005-2006**
- (9) Mr. Deborshi De, M. Sc. (Biochemistry), Calcutta U, **2006**
- (10) Mr. Suny Das, M. Sc. (Genetics), Calcutta U, **2005**
- (11) Mr. Subha Das, M. Sc. (Genetics), Calcutta U, **2004**
- (12) Mr. Kuladeep Jana, M. Sc. (Physiology), Vidyasagar U, **1998**

EXTRA MURAL RESEARCH (EMR) /CONSULTANCY PROJECTS CARRIED OUT: (RS. 404.25898 LAKHS)

1. "Molecular characterization of developed DNA markers linked to disease resistance/susceptibility in giant black tiger shrimp, *Penaeus monodon*" funded by **DST-SERB** (2015-Present), Total amount Rs. 48.668 lakhs
2. "Identification and characterization of micro RNAs (miRNAs) in *Penaeus monodon*" funded by **DBT** (2015-Present), Total amount Rs. 44.062 lakhs
3. "Exploration of Lichens from Barak Valley of Southern Assam and Arunachal Pradesh (North East India) and Isolation of Phytochemicals and Bioprospecting of some selected Lichens species" funded by **DBT-NER Twinning** (2012-2015), Total amount Rs. 61.88 lakhs
4. "Purification and characterization of bioactive natural antioxidant, immunomodulator and anticancer products from *Dioscorea alata* L., of North Eastern region of India" funded by **DBT-NER Twinning** (2011-2014), Total amount Rs. 64.12 lakhs
5. "Study on white spot syndrome virus (WSSV) prevalence and diversity of disease resistant population among wild giant black tiger shrimp (*Penaeus monodon*) of the entire coastal area of India" funded by **MoES** (2010-2014), Total amount Rs. 56.8432 lakhs
6. "Isolation and Identification of natural antioxidant and anticancer product in *Spondias pinnata*" funded by **CSIR** (2009-2012), Total amount Rs. 20.042 lakhs
7. "Disease resistance in giant black tiger shrimp, *Penaeus monodon*" funded by **DBT**, (2008-2011), Total amount Rs. 34.30 lakhs
8. "Study of shrimp Genome: Disease resistant DNA markers of *Penaeus monodon*" funded by Ministry of Earth Science (**MoES**), through OASTC, Berhampur University (2008-2011), Total amount Rs. 26.3578 lakhs
9. "*In vitro* study of the antioxidant, iron chelating and DNA protective properties of medicinal plants, their formulations and usefulness to combat cancer" funded by CCRAS, Department of **AYUSH**, Ministry of Health & Family Welfare, Govt. of India, (2008- 2010), Total amount Rs. 20.5436 lakhs

10. "Quantification of the cytokines mRNA based on competitive RT-PCR" funded by **ICMR**, (2005-2008), Total amount Rs14.15838 lakhs
11. "Development of microsatellite DNA markers for shrimp to identify disease resistant populations" funded by **DBT**, (2001-2004) Total amount Rs. 13.284 lakhs
12. Development of various consultancy projects with collaboration of the head, Environment Section and earned almost Rs. 13,68,134.21/- for Bose Institute (2001-2002)

TEACHING EXPERIENCES:

Teaching experience at PG level: 12 years

1. Conducted Teaching and Examination on "**Fishery Science Course, Unit I & II**" as a Visiting Fellow under UGC-Assigned Grant Scheme for 3rd semester M.Sc. (Fishery Science) Students at **Vidyasagar University**, 03rd – 09th February, 2017 (**30 classes, 60 hrs**)
2. Conducted Teaching and Examination of a course on "**Molecular and Cell Biology**" for 4th semester Integrated **M.Sc. – Ph.D.(Life Science)** at **Bose Institute**, 2012 – 2016 (**5X20 classes, 5X40 hrs**)
3. Conducted Teaching and Examination of a course on "**Advanced Immunology**" as a Visiting Fellow under UGC-Special Assistance Program for 4th semester M.Sc. (Zoology) Students at **University of North Bengal**, 17th – 26th February, 2011 (**20 classes, 40 hrs**); 12th – 21st March, 2012 (**20 classes, 40 hrs**)
4. Conducted Teaching and Examination of a course on "**Biochemistry**" as a Visiting Professor under UGC-unassigned grant for 3rd semester M.Sc. (Zoology) Students at **Guwahati University**, 16th – 25th October, 2011 (**30 classes, 60 hrs**)
5. Conducted Teaching and Examination of a course on "**Animal Biotechnology and Gene Therapy**" as a Guest Teacher for M.Sc (Genetics) Part-II students, **University of Calcutta**, August 19, 2005 - December 23, 2005 (**20 classes, 40 hrs**); February 01, 2008 - June 30, 2008 (**40 classes, 80 hrs**); March 05, 2010 - June 30, 2010 (**40 classes, 80 hrs**)
6. Conducted Teaching and Examination of a semester course on "**Molecular Biology**" for M. FSc. Students at **CIFE, Mumbai**, January 01, 2009 - June 30, 2009 (**30 classes, 60 hrs**)
7. Conducted Teaching and Examination of a course on "**Gene Therapy**" for M.Sc. (Biotechnology) Students, **University of North Bengal**, 22-26th March, 2004 (**20 classes, 40 hrs**)

Teaching experience at Ph. D. level: 12 years

1. Conducted Teaching and Examination of a course on "**Medical & Animal Biotechnology**" as a Co-Ordinator for **Ph.D. Students** at Bose Institute, 2014 – present (**4X20 classes, 4X40 hrs**)
2. Conducted Teaching and Examination of a course on "**Medical Biotechnology**" as a Co-Ordinator for **Ph.D. Students** at Bose Institute, 2002-2006, 2008-2011 (**9X20 classes, 9X40 hrs**)
3. Conducted Teaching and Examination of a certificate course on "**Sophisticated Instruments used in Biological and Biomedical Research**" as a Co-Ordinator for Post M. Sc. Students at Bose Institute, 2000-2001 (**1X20 classes, 1X40 hrs**)
4. Conducted Teaching and Examination of a course on "**Molecular Biology Technique**" as a Co-Ordinator for **Ph.D. Students** at Bose Institute, 1997-1998 (**1X20 classes, 1X40 hrs**)

Teaching experience at faculty training program: 04 years

1. Delivered a lecture on **“Burden & Risk of Non communicable diseases among Asian Indian population: An age old practice for their remedies using traditional medicine”** as a Resource Person at the Refresher Course in Behavioural Sciences on the theme ‘Theories and Practices in Anthropology and other Behavioural Sciences’ during February 02 - 22, 2017 organized by Dept. of Anthropology, University of Calcutta, **February 17, 2017**
2. Delivered four (4) lectures on **“Stress Response and Non-Communicable Disease in Human” & “Stress Response and Viral Disease in Marine Shrimp”** as a Resource Person at the Refresher Course - Life Sciences entitled **“Molecular Approaches of Stress Response in Living Organisms”** during October 10 - 30, 2014 organized by UGC – Academic Staff College, Sambalpur University, Odisha, **October 20 & 21, 2014**
3. Delivered four (4) lectures on **“Micro RNA: A magic molecule in the living world” & “Herbal medicine and its importance in 21st century”** as a Resource Person at the AICTE supported Staff development programme entitled **“Molecules of Living things”** during June 19 – July 03, 2006 organized by Periyar Maniammai College of Technology for Women, Periyar Nagar, Villam, Thanjavur-613403, Tamil Nadu, **June 20 & 21, 2006**
4. Delivered a lectures on **“Biotechnology in 21st century”** as a Resource Person for **UGC-NAAC** programme organized by Ramananda College, Bishnupur, Burduan University, **March 12, 2004**

EXPERIENCES AS EXAMINER/ EXPERT/ REVIEWER:

1. Conducted final practical examination of **M.Sc.** (Biotechnology) 1st & 3rd Semester as an Examiner for **NEHU** on December 16 & 17, 2016
2. Conducted final practical examination of **M.Sc.** (Biotechnology) 4th Semester as an Examiner for **NEHU** on July 14, 2016
3. Conducted final practical examination of **M.Sc.** (Life Science) 3rd Semester as an Examiner for **Sambalpur University** on February 15, 2016, February 02, 2017
4. Reviewed and Evaluated the research proposal entitled “Decoding the genome of a fish killer oomycete pathogen *Aphanomyces invadans* and deciphering host pathogen interactions in dynamics disease situations ” submitted for the position of **ICAR National Fellow** on January 27, 2016
5. Conducted Viva Voce Examination for **Ph. D.** degree of Ms. Salma Mazid, Dept of Zoology, **Gauhati University (GU)**, Guwahati, Assam, January 08, 2016
6. Reviewed and Examined of One (1) Thesis for **Ph.D.** degree as an Examiner for **Savitribai Phule Pune University (SPPU)**, Pune, Maharashtra, November 2015
7. Reviewed and Examined of One (1) Thesis for **Ph. D.** degree as an Examiner for **Gauhati University (GU)**, Guwahati, Assam, August 2015
8. Conducted Viva Voce Examination for **Ph. D.** degree of Mr. Monoj Lama, Dept of Zoology, University of North Bengal (**NBU**), Darjeeling, West Bengal, August 18, 2015
9. Reviewed and Examined of One (1) Thesis for **Ph. D.** degree as an Examiner for University of North Bengal (**NBU**), Darjeeling, West Bengal, May 2015
10. Reviewed and Examined of Four (4) Thesis for **Ph. D.** degree as an Examiner for North-Eastern Hill University (**NEHU**), Shillong, Meghalaya, April & December, 2013, December 2014, October 2016
11. Conducted final practical examination of **M.Sc.** (Biotechnology) 3rd Semester as an Examiner for **NEHU** on December 09, 2010; December 10, 2012; December 03, 2013

12. Reviewed and Evaluated the research project work and dissertations of M.Sc. (Biotechnology) 4th Semester as an examiner for **NEHU** on July 14& 15, 2011
13. Reviewed and Examined of Two (2) Thesis and conducted Viva Voce Examination for **M. Tech.** (Medical Science and Technology) degree as an Examiner from **IIT- Kharagpur**, 2004
14. Reviewed and Evaluated the progress of 11th & 12th plan programs entitled “Drug development from ocean” at **CDRI**, Lucknow, as an expert member of a review committee selected by Ministry of Earth Sciences (**MoES**), **Govt. of India**, 2012
15. Conducted examination of **Jagadis Bose National Science Talent Search (JBNSTS)**, Kolkata, as a question setter and examiner of Environmental Science 2004-2009
16. Reviewed and Evaluated of various **extramural research projects** as an expert reviewer for various funding agencies i.e., **ICAR** (National fellow in 2016) **DST-SERB** (4 projects in 2015, 2 projects in 2016), **DBT-BIRAC** (2015), **DBT** (2001, 2005, 2007, 2011, 2 projects in 2016), **MoES** (2008, 2 projects in 2012), **CSIR** (2008, 2 projects in 2011), **ICMR** (2008, 2009)
17. Reviewed and Evaluated various **research articles** as an expert reviewer for various **Peer-reviewed Journals** i.e., Science & Culture (2005-2006), Clinical Cardiology (Wiley Inter Science) (2007- 2014), Plant Foods for Human Nutrition (Springer) (2008-2014), Journal of Complementary and Integrative Medicine (2008-2014), Evidence-based Complementary and Alternative Medicine (2009, 2010), BMC-Complementary and Alternative Medicine (2010-2014), Natural Product Research (2010, 2012), ScienceAsia (2010), Pharmaceutical Biology (2011, 2014), FRUITS (2012), Cytotechnology (2013-2016), Cell Proliferation (2013), Indian Journal of Medical Research (2013), Journal of Medicinal Plant Research (2013, 2014), Chinese Journal of Limnology and Oceanology (2014), Springer Plus (2013), Scientometrics (2015)

OTHER MANAGEMENT SERVICES:

1. As a member of the Library Committee helped the management of Bose Institute (2000-2010)
2. As a member of the Material Procurement Committee helped the management of Bose Institute (2000-2005)
3. As a local In-charge of the Immunotechnology and Environment Section helped the management of Bose Institute to supervise technicians, peon and routine works (2001-2004)
4. As a local In-charge helped the management of Bose Institute to supervise technicians, peon and routine works of the central facility of instrument section at centenary building, Bose Institute (1997- 2003)
5. As a member of the annual report committee helped the management of Bose Institute (1997-1998)

AWARDS/ HONORS:

Awards:

1. Elected Fellow of SERS – 2015 for outstanding contribution in the field of Cancer Research given by Scientific and Educational Research Society, Meerut on February 01-05, 2016
2. Elected Fellow of FZS – 2014 for outstanding contribution in the field of Molecular Biology and Biotechnology given by The Zoological Society, Kolkata, on July 27, 2015
3. Received “**RAJIV GANDHI EXCELLENCE AWARD**” at a seminar on the occasion of the celebration birthday of former prime minister late Shri Rajiv Gandhi at New Delhi, India on August 18, 2008 organized by India International Friendship Society (IIFS), New Delhi

4. Received "BHARAT JYOTI AWARD" in the conference on "Economic Growth and National Integration" at New Delhi, India on May 31, 2008 organized by India International Friendship Society (IIFS), New Delhi
5. Received "GLORY OF INDIA GOLD MEDAL" in the conference on "Economic Growth and National Integration" at New Delhi, India on May 31, 2008 organized by International Institute of Success Awareness (IISA), New Delhi
6. Received a prestigious "POSTDOCTORAL TRAINING FELLOWSHIP" award during June 27, 1994 to August 31, 1996 by National Institute of Health (NIH), USA
7. Received award of CSIR-JRF (March 14, 1984 to March 13, 1986) & SRF, (March 14, 1986 to March 31, 1989) Gov. of India, through NET Examination, March 14, 1984 to March 31, 1989

Honors:

1. Delivered invited lecture, felicitated and presided over as Chairperson of a technical session in the National conference on "Current Developments and Next Generation Lichenology" held on January 27 – 28, 2018 at NBRI, Lucknow, India
2. Delivered invited Key note lecture, felicitated and presided over as Chairperson of a technical session in the "3rd International Conference and Expo on Herbal and Alternative Medicine" held on September 01-02, 2017 at Park Inn by Radisson, London, UK
3. Delivered invited lecture, felicitated, presided over as Chairperson of a technical session and Patrons in the International conference on "Innovative Approaches in Applied Sciences and Technologies" held on February 01-05, 2016 at Kasetsart University, Thailand
4. Delivered special invited lecture at conference on "Bioresources & Bioproducts: Ancient to Recent" January 20, 2016 organized by Dept. of Zoology, University of Gour Banga, Malda, India
5. Delivered special invited lecture and felicitated in the National conference on "Cryptogam Research in India: Progress and Prospects" September 28 – 29, 2015 organized by NBRI, Lucknow, India
6. Delivered invited lecture, felicitated, presided over as Chairperson of a technical session in the National conference on "Emerging trends in Biotechnology: present scenario and future dimensions", March 29 – 30, 2014 organized by Dept. of Biotechnology, Utkal University, Bhubaneswar, Odisha.
7. Delivered lead lecture, felicitated, presided over as Co- Chairperson of a technical session in the National conference on "Current trends in Life Sciences research and challenges ahead", February 28 – March 02, 2014 organized by Dept. of Life Sciences, Sambalpur University, Odisha.
8. Delivered lead lecture, felicitated, presided over as Convener of a session and Judge of a technical session in the International conference on "Global IPR System and WTO Issues", Nov. 16-17, 2013 organized by Dept. of Biotechnology, Ch. Charan Singh University, Meerut (UP) India.
9. Felicitated and presided over as Chairman of a session at International Symposium on "Bioresources and Human Sustenance", October 20-22, 2011 organized by Department of Zoology, Cotton College & Zoological Society of Assam (ZSA), Guwahati, Assam.
10. Delivered plenary lecture, felicitated and presided over as Co-chairman of a session at Sir J.C. Bose Memorial National Symposium on "Modern Trends in Animal Science Research and Challenges of the Day", March 23, 2011 organized by Department of Zoology and Molecular Biology & Genetics, Presidency University, Kolkata, West Bengal.

11. Delivered Plenary Lecture and presided over as Co-chairman of a session at in National Symposium on “Parasite Taxonomy, Biodiversity and Fish Health: Environmental Impact”, March 12- 13, 2010 organized by Department of Zoology, Andhra University , Visakhapatnam, Andhra Pradesh
12. Delivered invited lecture, presided over as chairman of a session at 4th International Symposium on “Biocontrol and Biotechnology”, November 27-29, 2006 organized by Department of Zoology and Biotechnology, Lady Doak College, Madurai, Tamil Nadu, India

MEMBERSHIP OF LEARNED SOCIETIES:

1. Life member of **Zoological Society**, Kolkata
2. Life member of **Indian Lichenological Society (ILS)**, India
3. Life member of **Society of Biological Chemist (SBC)**, India
4. Life member of **Swadeshi Science Movement of India**, New Delhi
5. Life Member of **The Asiatic Society**, Kolkata

SPEECH DELIVERED AT MEETING/ CONFERENCES/ SEMINARS/ SYMPOSIA:

1. Delivered an invited lecture on “**Importance of Lichen to control non-communicable diseases**” at the National Conference on “Current Developments and Next Generation Lichenology” held on January 27 – 28, 2018 at NBRI, Lucknow, India organized by Indian Lichenological Society (ILS) NBRI, Lucknow
2. Delivered an invited Key note lecture on “**Drug development from natural resources: An insectivorous plant, Drosera burmannii, is a source of better medicine to combat breast cancer by altering tumor – microenvironment**” at the “3rd International Conference and Expo on Herbal and Alternative Medicine” held on September 01-02, 2017 at Park Inn by Radisson, London, UK Organized by Allied Academies
3. Delivered an invited lecture on “**Role of DNA markers to control white spot disease (WSD) in marine shrimp aquaculture**” at the International Conference on “Aquatic Resources and Sustainable Management” held on **February 17 - 19, 2016** at Science City, Kolkata organized by Central Calcutta Science and Culture Organization for Youth (CCSCOY), Kolkata, India
4. Delivered a special invited lecture on “**Sundew plant: Source for drug against multiple non-communicable diseases**” at the International Conference on “Innovative Approaches in Applied Sciences and Technologies” held on **February 01-05, 2016** at Kasetsart University, Thailand organized by Scientific Educational Research Society (SERS), Meerut, India and Kasetsart University, Bangkok, Thailand
5. Delivered a special invited lecture on “**Role of Biotechnology based research in the field of disease management**” at the National conference on “Bioresources & Bioproducts: Ancient to Recent” held on **January 20, 2016** organized by Dept. of Zoology, University of Gour Banga, Malda, India
6. Delivered a special invited lead lecture on “**A tropical lichen, Parmotrema reticulatum, could be a source for better medicine to combat cancer and inflammatory diseases**” at the National Conference on Cryptogam Research in India: Progress and Prospects held on **September 28 – 29, 2015** organized by Indian Lichenological Society (ILS) NBRI, Lucknow
7. Delivered a special invited lead lecture on “**Present scenario of Medical Biotechnology in India: Importance of Medicinal plants to control iron-overload-induced hepatotoxicity and cancer**” at the National symposium on "Emerging trends in Biotechnology: Present scenario and future dimensions", **March 29 – March 31, 2014** organized by Post Graduate Dept. of Biotechnology, Utkal University, Odisha

8. Delivered a special invited lead lecture on **“Importance of various DNA markers for the development of specific pathogen resistant (SPR) *Penaeus monodon*”** at the National conference on "Current trends in Life Sciences research and challenges ahead", **February 28 – March 02, 2014** organized by Dept. of Life Sciences, Sambalpur University, Odisha.
9. Delivered a special invited Lecture on **“Importance of patents in scientific research: A case study of microRNA research”** in the International conference on “Global IPR System and WTO Issues”, **November 16-17, 2013** organized by Dept. of Biotechnology, Ch. Charan Singh University, Meerut (UP), India
10. Delivered a special invited Lecture on **“Iron chelation by *Terminlia chebula*: New remedies from an age-old plant”** in the International conference on “Biologically active substances and materials: fundamental and applied problems of production and application”, **May 27-June 01, 2013** Crimea, in the Novy Svet, Ukraine organized by Education-Science Center "Institute of Biology", Taras Shevchenko National University of Kyiv, Ukraine
11. Delivered a special invited Lecture on **“Importance of DNA markers linked to disease resistance in marine shrimp (*Penaeus monodon*)”** in the “BIT’s 2nd Annual World Congress of Marine Biotechnology” on **September 20-23, 2012** organized by BIT Congress Inc., Dalian, China.
12. Delivered a special invited Lecture on **“Importance of Biotechnology based research to control disease in Aquatic animal and Human”** at the National Symposium on “Research In Animal Science: Development and Evaluation”, **March 19- 20, 2012**, organized by the Department of Zoology, University of North Bengal, Siliguri - 734013, West Bengal.
13. Delivered a Lecture on **“DNA markers linked to disease resistance in shrimp (*Penaeus monodon*)”** in International symposium on “From innovations in nucleic acids research to regulation of Biological processes” of the day on **December 17-19, 2011** organized by Department of Microbiology and Molecular Biology, Indian Institute of Science, Bangalore.
14. Delivered Plenary Lecture on **“Importance of Biotechnology to control various diseases in human as well as in aquatic animal”** at National Symposium on “Sir J. C. Bose memorial National Symposium on Recent Trends in Animal Science Research and the challenges of the day”, **March 23-25, 2011**, organized by Department of Zoology, Presidency University , Kolkata
15. Delivered an invited Lecture on **“Biotechnology for disease management in human and aquatic organism”** at the Department of Zoology, University of North Bengal, Siliguri - 734013, West Bengal (**26th February, 2011**)
16. Delivered Plenary Lecture on **“Importance of DNA markers for developing disease free shrimp (*Penaeus monodon*) aquaculture”** at National Symposium on Parasite Taxonomy, Biodiversity and Fish Health: Environmental Impact, **March 12- 13, 2010**, organized by Department of Zoology, Andhra University , Visakhapatnam, Andhra Pradesh, India
17. Delivered a guest lecture on **February 17, 2007** entitled on **“Molecular mechanism of White Spot Virus (VSV) in Shrimps”** at P.G. Department of Biotechnology, Utkal University, Bhubaneswar, Orissa
18. Delivered a talk on **“Sustainability of disease resistant shrimp (*Penaeus monodon*) aquaculture”** at 4th International Symposium on **Biocontrol and Biotechnology**, **November 27- 29, 2006** organized by Department of Zoology and Biotechnology, at Lady Doak College, Madurai, Tamil Nadu, India.

19. Delivered a talk on “**Disease resistant microsatellite DNA marker of Giant black tiger shrimp, *Penaeus monodon***” at National Symposium on **Cross-Talk between Zoology and Technology, November 16- 17, 2006** organized by Department of Zoology, University of North Bengal, Siliguri - 734013, West Bengal.
20. Delivered a talk on “**Disease management of Giant black tiger shrimp (*Penaeus monodon*)**” at National Symposium on **Biomedicine in Aquaculture, March 17- 18, 2006** organized by Centre for Marine Science and Technology, Manonamiam Sundaranar University, Marina Campus, Rajakkamanglam - 629 502, Kanyakumari District, Tamil Nadu.
21. Delivered a talk on “**Genome of *Penaeus monodon*: Disease resistant DNA markers of shrimp**” at Central Institute of Fisheries Education (CIFE), Mumbai, **September 21, 2005**.
22. Delivered a talks on “**Biotechnology in 21st century**” at Biotechnology Dept., North Bengal University (**27th March, 2004**).
23. Delivered a talk on “**Structure–Function relationship of initiator tRNA in protein synthesis initiation**” at Tata Institute of Fundemental Research (TIFR), Mumbai, **September 1996**.
24. Delivered a talk on “**Structure–Function relationship of initiator tRNA in protein synthesis initiation**” at Tata Memorial Center for Cancer Research (TMCCR), Mumbai, **September 1996**.
25. Delivered a talk on “**Structure–Function relationship of initiator tRNA in protein synthesis initiation**” at Monsanto Pharmaceutical Ltd., St. Louis, USA, **September 1995**.
26. Delivered a talk on “**Structure–Function relationship of initiator tRNA in protein synthesis initiation**” at Center for Cellular and Molecular Biology (CCMB), Hyderabad, **March 18, 1992**.

ATTENDED MEETING/ SYMPOSIUM/ CONFERENCES/ SEMINARS:

1. Attended the national seminar on the “**New Education Policy (NEP) of the government of India**”, held on **7-8 November 2015** at RK Mission Institute of Culture, Golpark, Kolkata organized by VIDYARTHI VIKASH, RK Mission Institute of Culture, RK Mission Vivekananda University, Belur Math, Howrah, and AICTE, New Delhi, India
2. Attended the 2nd International Symposium on “**Perspective of Cell Signaling and Molecular Medicine**” held on **January 8-11, 2012** at Bose Institute organized by Division of Molecular Medicine, Bose Institute, Kolkata, India
3. Attended the International Symposium on “**Bioresources and Human Sustenance**” held on **October 20-22, 2011** at Cotton College, Guwahati organized by Department of Zoology, Cotton College & Zoological Society of Assam (ZSA), Guwahati, Assam
4. Attended the International Symposium on “**Perspective of Cell Signaling and Molecular Medicine**” held on **November 27-29, 2008** at Bose Institute organized by Division of Molecular Medicine, Bose Institute, Kolkata, India
5. Attended the National Seminar on “**Ayurveda in Health Care and Its Socioeconomic Impact**” held on **March 29-30, 2008** at RK Mission Ashrama, Narendrapur, Kolkata-700103 organized by CRI, Dept of AYUSH, Kolkata; Vivekananda Vijnan Mission, Kolkata and J. B. Roy State Ayurvedic Medical College & Hospital, Kolkata
6. Attended the National conference on “**Economic Growth and National Integration**” held on **May 31, 2008** at New Delhi, India organized by **India International Friendship Society (IIFS)**, New Delhi and **International Institute of Success Awareness (IISA)**, New Delhi

7. Attended the National seminar on the occasion of the celebration birthday of former prime minister late Shri Rajiv Gandhi at New Delhi, India held on **August 18, 2008** at New Delhi organized by **India International Friendship Society (IIFS)**, New Delhi
8. Attended **the** 2nd International Symposium on “**Translational Research: Natural Products and Cancer**” held on **December 9-12, 2007** at Lonavala, Mumbai, India organized by The University of Texas, M. D. Anderson Cancer Center, 1515 Holcombe Boulevard, BOX 143, Houston, TX 77030, USA

RELEVANT INFORMATION:

1. Certificate holder of “**Ethics for Research Scientists**” from Saint Louis University Health Science Center, St. Louis, USA.
2. **Certificate “A” and Certificate “B”** holder from N.C.C., Govt. of India.
3. Green card holder from Govt. of USA (upto 2004)