

Disease Biology

Researchers at Brainware University are working on the frontier areas of disease biology. Their research mainly focuses on deciphering molecular pathways of breast cancer, glioma, and oral cancer and developing novel targeted therapies. One of the core areas of interest in this field is understanding the molecular mechanisms of cancer stem cells and chemoresistance and identifying natural compounds to target them. Our team also working on polycystic ovarian disorder, cardiovascular disease, and wound healing etc.

Faculty Members:

1. Dr. Asim Kumar Basak
2. Dr. Moumita Kundu
3. Dr. Subhayan Das
4. Dr. Vertika Rai

List of Publications:

1. **Subhayan Das, Moumita Kundu**, Atif Hassan, Aditya Parekh, Bikash Ch. Jena, Swati Mundre, Indranil Banerjee, Rajesh Yetirajam, Chandan K. Das, Anjan K. Pradhan, Swadesh K. Das, Luni Emdad, Pralay Mitra, Paul B. Fisher, and Mahitosh Mandal, A novel computational predictive biological approach distinguishes Integrin β 1 as a salient biomarker for breast cancer chemoresistance, [Biochimica et Biophysica Acta. Molecular Basis of Disease](#), **2023**, 1869, 166702. **IF: 6.2**
2. **Subhayan Das**, Koushik Bhattacharya, Jonny J. Blaker, Nikhil K. Singha, and Mahitosh Mandal, Beyond traditional therapy: Mucoadhesive polymers as a new frontier in oral cancer management, [Biopolymers](#), **2023**, 114, e23556. **IF: 2.9**
3. Aditya Parekh*, **Subhayan Das***, Chandan K. Das, and Mahitosh Mandal, Progressing Towards a Human-Centric Approach in Cancer Research, [Frontiers in Oncology](#), **2022**, 12, 896633. **IF: 4.7**

4. Proma Bhattacharya, **Moumita Kundu**, **Subhayan Das**, Yash Verma, Mahitosh Mandal, and Sudarsan Neogi, Acceleration of wound healing By PVA-PEG-MgO nanocomposite hydrogel with human epidermal growth factor, [Materials Today Communications](#), **2023**, 37, 107051–10761. **IF: 3.8**
5. **Moumita Kundu**, **Subhayan Das**, Suvendu Nandi, Dibakar Dhara, and Mahitosh Mandal, Magnolol and Temozolomide exhibit a synergistic anti-glioma activity through MGMT inhibition., [Biochimica et Biophysica Acta. Molecular Basis of Disease](#), **2023**, 1869, 166782. **IF: 6.6**
6. **Moumita Kundu**, **Subhayan Das**, Chandan Kanta Das, Gaurav Kulkarni, Soumen Das, Dibakar Dhara, and Mahitosh Mandal, Magnolol induces cytotoxic autophagy in glioma by inhibiting PI3K/AKT/mTOR signaling, [Experimental Cell Research](#), **2023**, 424113488. **IF: 3.7**
7. Koushik Bhattacharya, **Moumita Kundu**, **Subhayan Das**, Sarthik Samanta, Sib Sankar Roy, Mahitosh Mandal, and Nikhil K. Singha, Glycopolymer Decorated pH-Dependent Ratiometric Fluorescent Probe Based on Förster Resonance Energy Transfer for the Detection of Cancer Cells., [Macromolecular Rapid Communications](#), **2022**, 44, e2200594. **IF: 4.6**
8. Priti Prasanna Maity, Puja Poddar, **Subhayan Das**, Krishna Dixit, Dibakar Dhara, Mahitosh Mandal, Amit Roy Chowdhury, Santanu Dhara, and Sumanta Mukherjee, Size dependent regeneration capacity of functionalized Capra ear-derived micro-tissue scaffolds for treatment of cartilage defects, [Materialia](#), **2022**, 26, 101569. **IF: 3.4**
9. Koushik Bhattacharya, **Subhayan Das**, **Moumita Kundu**, Sudarshan Singh, Uddhab Kalita, Mahitosh Mandal, and Nikhil K. Singha, Gold Nanoparticle Embedded Stimuli-Responsive Functional Glycopolymer: A Potential Material for Synergistic Chemo-Photodynamic Therapy of Cancer Cells, [Macromolecular Bioscience](#), **2022**, 22, 2200069. **IF: 4.6**
10. Angana Biswas, Yetirajam Rajesh, **Subhayan Das**, Indranil Banerjee, Neelkamal Kapoor, Pralay Mitra, and Mahitosh Mandal, Therapeutic targeting of RBPJ, an upstream regulator of ETV6 gene, abrogates ETV6-NTRK3 fusion gene transformations in glioblastoma, [Cancer Letters](#), **2022**, 544, 215811. **IF: 9.7**
11. Bikash Chandra, Chandan Kanta Das, Indranil Banerjee, Deblina Bharadwaj, Ranabir Majumder, **Subhayan Das**, Angana Biswas, **Moumita Kundu**, Pritam Kumar Roy, Chanakya Nath Kundu, and Mahitosh Mandal, TGF- β 1 induced autophagy in cancer associated fibroblasts during hypoxia contributes EMT and glycolysis via MCT4 upregulation, [Experimental Cell](#)

Research, 2022, 417, 113195. **IF: 3.7**

12. Ankita Dey, **Moumita Kundu, Subhayan Das**, Bikash Chandra Jena, and Mahitosh Mandal, Understanding the function and regulation of Sox2 for its therapeutic potential in breast cancer., *Biochimica et Biophysica Acta. Reviews on Cancer*, 2022, 1877, 188692. **IF: 11.41**
13. Bikash Chandra Jena, Chandan Kanta Das, Indranil Banerjee, **Subhayan Das**, Deblina Bharadwaj, Ranabir Majumder, and Mahitosh Mandal, Paracrine TGF- β 1 from breast cancer contributes to chemoresistance in cancer associated fibroblasts via upregulation of the p44/42 MAPK signaling pathway., *Biochemical Pharmacology*, 2021, 186, 114474. **IF: 5.8**
14. Sunaina Sapru, **Subhayan Das**, Mahitosh Mandal, Ananta K. Ghosh, and Subhas C. Kundu, Sericin-chitosan-glycosaminoglycans hydrogels incorporated with growth factors for in vitro and in vivo skin repair, *Carbohydrate Polymers*, 2021, 258, 117717. **IF: 11.2**
15. Sankha Subhra Das, **Subhayan Das**, Prasanna Kumar Byram, Motiur Rahaman, Tuphan Kanti Dolai, Anish Chatterjee, and Nishant Chakravorty, MicroRNA expression patterns in HbE/ β -thalassemia patients: The passwords to unlock fetal hemoglobin expression in β -hemoglobinopathies, *Blood Cells, Molecules & Diseases*, 2021, 87, 102523. **IF: 2.3**
16. Sovan Lal Banerjee, **Subhayan Das**, Koushik Bhattacharya, **Moumita Kundu**, Mahitosh Mandal, and Nikhil K. Singha, Ag NPs incorporated self-healable thermoresponsive hydrogel using precise structural “Interlocking” complex of polyelectrolyte BCPs: A potential new wound healing material, *Chemical Engineering Journal*, 2021, 405 126436. **IF: 15.1**
17. Sayan, Poushali Das, Tushar Kanti Das, Sabyasachi Ghosh, **Subhayan Das**, Madhuparna Bose, Mahitosh Mondal, Amit Kumar Das, and Narayan Ch Das, Acoustic cavitation assisted de-stratified clay tactoid reinforced in situ elastomer-mimetic semi-IPN hydrogel for catalytic and bactericidal application., *Ultrasonics Sonochemistry*, 2020, 60, 104797. **IF: 8.4**
18. Y. Rajesh, Angana Biswas, Utkarsh Kumar, Indranil Banerjee, **Subhayan Das**, Santanu Maji, Swadesh K. Das, Luni Emdad, Webster K. Cavenee, Mahitosh Mandal, and Paul B. Fisher, Lumefantrine, an antimalarial drug, reverses radiation and temozolomide resistance in glioblastoma, *Proceedings of the National Academy of Sciences*, 2020, 117, 12324–12331. **IF: 11.1**
19. Y. Rajesh, Angana Biswas, Payel Banik, Ipsita Pal, **Subhayan Das**, Sachin A. Borkar, Hardik Sardana, Abhijit Saha, Swadesh K. Das, Luni Emdad, Paul B. Fisher, and Mahitosh Mandal, Transcriptional regulation of HSPB1 by Friend leukemia integration-1 factor

- modulates radiation and temozolomide resistance in glioblastoma, [Oncotarget](#), **2020**, 11, 1097–1108. **IF: 2.68**
20. Arindam Banerjee, **Subhayan Das**, Mahitosh Mandal, and Somenath Ganguly., Fluidic embedding of additional macroporosity in alginate-gelatin composite structure for biomimetic application, [Journal of Biomaterials Science, Polymer Edition](#), **2020**, 1–22. **IF: 3.6**
 21. Chandan Kanta Das, Bikash Chandra Jena, Indranil Banerjee, **Subhayan Das**, Aditya Parekh, Sujit Kumar Bhutia, and Mahitosh Mandal, Exosome as a Novel Shuttle for Delivery of Therapeutics across Biological Barriers., [Molecular Pharmaceutics](#), **2019**, 16, 24–40. **IF: 5**
 22. Sunaina Sapru, **Subhayan Das**, Mahitosh Mandal, Ananta K. Ghosh, and Subhas C. Kundu, Nonmulberry silk protein sericin blend hydrogels for skin tissue regeneration - in vitro and in vivo, [International Journal of Biological Macromolecules](#), **2019**, 137, 545–553. **IF: 8.2**
 23. Sayan Ganguly, Poushali Das, **Subhayan Das**, Uttamkumar Ghorai, Madhuparna Bose, Sabyasachi Ghosh, Mahitosh Mondal, Amit Kumar Das, Susanta Banerjee, and Narayan Ch Das, Microwave assisted green synthesis of Zwitterionic photoluminescent N-doped carbon dots: An efficient ‘on-off’ chemosensor for tracer Cr(+6) considering the inner filter effect and nano drug-delivery vector, [Colloids and Surfaces A: Physicochemical and Engineering Aspects](#), **2019**, 579, 123604. **IF: 5.2**
 24. **Moumita Kundu**, **Subhayan Das**, Dibakar Dhara, and Mahitosh Mandal, Prospect of natural products in glioma: A novel avenue in glioma management, [Phytotherapy Research](#), **2019**, 33, 2571–2584. **IF: 7.2**
 25. Y. Rajesh, Anupam Banerjee, Ipsita Pal, Angana Biswas, **Subhayan Das**, Kaushik Kumar Dey, Neelkamal Kapoor, Ananta Kumar Ghosh, Pralay Mitra, and Mahitosh Mandal, Delineation of crosstalk between HSP27 and MMP-2/MMP-9: A synergistic therapeutic avenue for glioblastoma management, [Biochimica et Biophysica Acta \(BBA\) - General Subjects](#), **2019**, 1863, 1196–1209. **IF: 4.11**
 26. Koushik Bhattacharya, Sovan Lal Banerjee, **Subhayan Das**, Sarthik Samanta, Mahitosh Mandal, and Nikhil K. Singha, REDOX Responsive Fluorescence Active Glycopolymer Based Nanogel: A Potential Material for Targeted Anticancer Drug Delivery, [ACS Applied Bio Materials](#), **2019**, 2, 2587–2599. **IF: 4.7**
 27. Y. Rajesh, Angana Biswas, Utkarsh Kumar, **Subhayan Das**, Indranil Banerjee, Payel Banik, Rashmi Bharti, Santoshi Nayak, Sudip K. Ghosh, and Mahitosh Mandal, Targeting

- NFE2L2, a transcription factor upstream of MMP-2: A potential therapeutic strategy for temozolomide resistant glioblastoma, *Biochemical Pharmacology*, **2019**, 164, 1–16. **IF: 5.8**
28. Aditya Parekh, Debanjan Das, **Subhayan Das**, Santanu Dhara, Karabi Biswas, Mahitosh Mandal, and Soumen Das, Bioimpedimetric analysis in conjunction with growth dynamics to differentiate aggressiveness of cancer cells., *Scientific Reports*, **2018**, 8, 783. **IF: 4.9**
29. Suraj Konar, Dipanjan Samanta, Subhajit Mandal, **Subhayan Das**, Madhusudan Kr Mahto, Manisha Shaw, Mahitosh Mandal, and Amita Pathak, Selective and sensitive detection of cinnamaldehyde by nitrogen and sulphur co-doped carbon dots: a detailed systematic study, *RSC Advances*, **2018**, 8, 42361–42373. **IF: 3.9**
30. Sunaina Sapru, **Subhayan Das**, Mahitosh Mandal, Ananta K. Ghosh, and Subhas C. Kundu, Prospects of nonmulberry silk protein sericin-based nanofibrous matrices for wound healing - In vitro and in vivo investigations., *Acta Biomaterialia*, **2018**, 78, 137–150. **IF: 9.7**
31. Aditya Parekh, **Subhayan Das**, Sheetal Parida, Chandan Kanta Das, Debabrata Dutta, Sanjaya K. Mallick *et al.*, Multi-nucleated cells use ROS to induce breast cancer chemoresistance in vitro and in vivo, *Oncogene*, **2018**, 37, 4546–4561. **IF: 8.8**
32. Santi M. Mandal, Jahangir Khan, Denial Mahata, Suman Saha, Jayangshu Sengupta, Osmar N. Silva, **Subhayan Das**, Mahitosh Mandal, and Octavio L. Franco, A self-assembled clavanin A-coated amniotic membrane scaffold for the prevention of biofilm formation by ocular surface fungal pathogens., *Biofouling*, **2017**, 33, 881–891. **IF: 2.7**
33. Goutam Dey, Rashmi Bharti, Indranil Banerjee, Anjan Kumar Das, Chandan Kanta Das, **Subhayan Das**, Bikash Chandra Jena, Mridula Misra, Ramkrishna Sen, and Mahitosh Mandal, Pre-clinical risk assessment and therapeutic potential of antitumor lipopeptide ‘Iturin A’ in an in vivo and in vitro model, *RSC Advances*, **2016**, 6, 71612–71623. **IF: 3.9**
34. Ipsita, Kaushik Kr. Dey, Madhuri Chaurasia, Sheetal Parida, **Subhayan Das**, Y. Rajesh, Kulbhushan Sharma, Tamohan Chowdhury, and Mahitosh Mandal, Cooperative effect of BI-69A11 and celecoxib enhances radiosensitization by modulating DNA damage repair in colon carcinoma., *Tumour Biology*, **2016**, 37, 6389–402. **IF: 3.65**
35. Kaushik Kr. Dey, Rashmi Bharti, Goutam Dey, Ipsita Pal, Y. Rajesh, S. Chavan, **Subhayan Das et al.**, S100A7 has an oncogenic role in oral squamous cell carcinoma by activating p38/MAPK and RAB2A signaling pathway., *Cancer Gene Therapy*, **2016**, 23 382–391. **IF: 6.1**

36. Kacoli Banerjee, Shubhadeep Banerjee, **Subhayan Das**, and Mahitosh Mandal., Probing the potential of apigenin liposomes in enhancing bacterial membrane perturbation and integrity loss., *Journal of Colloid and Interface Science*, **2015**, 453, 48–59. **IF: 9.9**
37. Roy B, **Kundu M**, Singh AK, Singha T, Bhattacharya S, Datta PK, Mandal M, Singh NDP. Stepwise dual stimuli triggered dual drug release by a single naphthalene based two-photon chromophore to reverse MDR for alkylating agents with dual surveillance in uncaging steps. *Chem Comm*. **2019**; 55:13140-13143. **IF: 6.0**
38. Bhattacharya K, Banerjee SL, **Kundu M**, Mandal M, Singha NK. Glycopolymer ornamented octa-arm POSS based organic-inorganic hybrid star block copolymer as a lectin binding ligand. *Mater Sci Eng C Mater Biol Appl*. **2020** Nov. **IF: 7.3**
39. Singh AK, **Kundu M**, Roy S, Roy B, Shah SS, Nair AV, Pal B, Mondal M, Singh NDP. A two-photon responsive naphthyl tagged p-hydroxyphenacyl based drug delivery system: uncaging of anti-cancer drug in the phototherapeutic window with real-time monitoring. *Chem Comm (Camb)*. **2020** Sep. **IF: 6.0**
40. **Kundu M**, Majumder R, Das CK, Mandal M. Natural products based nanoformulations for cancer treatment: Current evolution in Indian research. *Biomed mater*. **2021** Feb. **IF: 4.1**
41. Roy B, Roy S, **Kundu M** et al. Ground-State Proton-Transfer (GSPT)-Assisted Enhanced Two-Photon Uncaging from a Binol-based AIE-Fluorogenic Phototrigger. *Organic letters*. **2021** Mar. **IF: 6.0**
42. Bhattacharya K, **Kundu M** et al. Glycopolymer Decorated pH-Dependent Ratiometric Fluorescent Probe Based on Förster Resonance Energy Transfer for the Detection of Cancer Cells. *Macromol. Rapid Commun*. **2022** Oct. **IF: 5.7**
43. Banerjee P, Kapse P*, Siddique S*, **Kundu M** et al. Therapeutic implications of cancer stem cells in prostate cancer. *Can Bio Med*. **2023** Apr. **IF: 5.2**
44. **Vertika Rai**, Rashmi Mukherjee, Arvind Routray, Ananta Kumar Ghosh, Seema Roy, Barnali Paul Ghosh, Puspendu Bikash Mandal ,Serum-based diagnostic prediction of oralsubmucous fibrosis using FTIR spectrometry, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 189(**2018**), 322-329.
45. **Vertika Rai**, Rashmi Mukherjee, Ananta K. Ghosh, Aurobinda Routray, Chandan Chakraborty, Omics in oral cancer: New approaches for biomarker discovery, *Archives of oral biology*,87(**2018**)15-34.

46. **Vertika Rai**, Surajit Bose, Satadal Saha, Virendra Kumar, Chandan Chakraborty, Delineating metabolic dysfunction in cellular metabolism of oral submucous fibrosis using ¹H nuclear magnetic resonance spectroscopy,9,(2019),102-108.
47. **Vertika Rai**, Surajit Bose, Rashmi Mukherjee, Arpita Sarbajna, Chandan Chakraborty, Evaluation of Aberrant Metabolism Related Proteins in Oral Sub Mucous Fibrosis: A pilot Study, *Journal of oral bioscience*,60(4),83-102.
48. **Vertika Rai**, Surajit Bose, Satadal Saha,Chandan Chakaraborty, Evalutaion of oxidative stress and microenvironment in oral submucous fibrosis, *Heliyon*,5(4):e01502,2019.
49. **Basak AK** and Koley J., Experimental Myocardial Ischemia induced defecatory reflex in the anesthetized cat: Study to explore neural pathway for such cardiogenic reflex. *Iranian Heart Journal*.2024,25(1),6-18.
50. Koushik Bhattacharya, Rajen Dey, Debanjana Sen, Nimisha Paul, **Asim Kumar Basak**, Alak Kumar Syamal, Polycystic ovary syndrome and its management: In view of oxidative stress, *Biomolecular Concepts*.2024,15(1).
51. Dey, R., Bhattacharya, K., **Basak, A.K.**, Roy, S.S., Syamal, A.K.Inflammatory perspectives of polycystic ovary syndrome: role of specific mediators and markers, *Middle East Fertility Society Journal*.2023,28(1),33.
52. **Asim Kumar Basak**, Neurophysiological basis of myocardial ischemic Pain-induced rectal reflex in the anesthetized cat: An experimental study. *Journal of Population Therapeutics & Clinical Pharmacology*.2023,30(6):562-572.
53. **Basak A. K.**, Occurrence of blood group pattern in Nepalese population of mixed origin in Tarai Region, *J. Ind. Med. Assoc*.2000,118(4):28-30.
54. **Basak AK** & Maji K, Study of relationship between ABO & Rh Blood group and Type 2 Diabetic Mellitus. *Int. J. Med. Res. Rev*.2016,4(11):1965-68.
55. **Basak AK** & Kaur M, Frequency distribution of blood group with its allelic configuration among the studied population of Delhi NCR region. *Biomed. Rev. J. Basic & Appl. Med. Sci*.2016,3(2):32-36.
56. Koley J, Das M, **Basak AK** and Koley BN, Ventricular nociception induced vesicular motility and urine flow: Their relationship. *Ind J Physiol & Pharmacol*.2001,45(4):463-469.
57. Das M, Koley J, **Basak AK** and Koley BN, Vesicular motility associated with cardiac nociception. *Ann Nat Acad Med Sci (India)*.2000,36(2&3):97-106.

58. Koley J, **Basak AK**, Das M, Haque Z and Koley BN, The neural mechanism of rectal motility response induced by epicardial application of lactic acid. [Jap J Physiol.](#)**1999**,49(3):283-288.
59. Koley J, **Basak AK**, Das M, and Koley BN, Cardiac nociception induced rectal response: Relations with hemodynamic changes. [Ind J Physiol & Pharmacol.](#)**1998**,42(2): 259-265.
60. Koley J, Das M, **Basak AK** and Koley BN, Cardiac nociception induced urinary bladder movement: The afferent pathways. [Med Sci Res.](#)**1997**,25: 597-599.
61. Koley J, **Basak AK**, Das M, Sinha S and Koley BN,Rectal response of cardiac origin in cats: involvement of nitric oxide and acetylcholine. [Eur J Pharmacol.](#)**1997**,325:181-187.
62. Koley J, Sinha S, **Basak AK**, Das M, Dube SN et al. Cardiovascular and respiratory changes following exposure to a synthetic toxin of *Ptychodiscus brevis*. [Eur J Pharmacol.](#)**1995**,293: 483-486.

Book Chapters:

1. **Subhayan Das, Moumita Kundu**, Bikash Chandra Jena, and Mahitosh Mandal, Causes of cancer: physical, chemical, biological carcinogens, and viruses, in: Biomater. 3D Tumor Model., [Elsevier, 2020](#): pp. 607–641.
2. **Subhayan Das, Moumita Kundu**, Ankita Dey, Deblina Bharadwaj, Pritam Kumar Roy, Shreya Banerjee, and Mahitosh Mandal, Molecular Pathways in Breast Cancer Chemoresistance, in: Handbook of Oncobiology: From Basic to Clinical Sciences, [Springer Nature](#), Singapore, **2023**: pp. 1–24.
3. Animesh Upadhyaya, **Vertika Rai**, Debdutta Pal, Surajit Bose, Somnath Ghosh, Web-assisted non-invasive detection of Oral Submucous Fibrosis using IoHT, [Wiley, Scrivener, 2022](#).
4. Animesh Upadhyaya, **Vertika Rai**, Surajit Bose, Dipankar Bhattacharyya, Jayanta Mukhopadhyay, Computer Vision based edge computing system to detect health informatics for Oral pre-cancer, [Springer, 2023](#).

Patents:

1. Machine Learning Based Chip Control Oxygen Concentrator with filter, Application no: 387736-001, **2023**, Granted.

2. System To Detect Oral Cancer Using Smartphone Platform Integrated With Fluorescent Paper strip Indian patent no 202231068174, Published **2023**.
3. An Noninvasive Diagnostic system based on illumination for early stage oral cancer screening, Indian Patent No 202231068123, Published **2022**.
4. A Device for routine Biochemical examination of urine, Indian Patent N202231068124, Published **2022**
5. A compact laminar air flow system, Indian Patent No 202231068122, Published,2022 Copper Titanium Dioxide mask, Provisional Patent Application No. 202131034237, Patent applied, 9 June **2022**.
6. A rapid and low cost biochemical method for thalassaemia carrier detection, Application no 2021104630, Accepted.