SWAGATA DASGUPTA

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EDUCATION:

Year	Degree	Institution
1990-1994	Ph.D.	Rensselaer Polytechnic Institute, USA
1988-1989	Post M.Sc.	Saha Institute of Nuclear Physics, Calcutta
1985-1987	M.Sc.	Indian Institute of Technology Kanpur
1981-1984	B.Sc.(Hons)	Presidency College, Calcutta

RESEARCH HIGHLIGHTS:
Broad Area: Biophysical Chemistry
Specific Area: Protein-protein and Protein-small molecule interactions
Publications: Journals: **150+ (***h index 35 ; i-10 index 107***)**
Citations: **4500+** (Source : Google Scholar)
https://scholar.google.com/citations?user=bzN30wcAAAAJ&hl=en
Supervision: *Completed:* Ph.D. **29**, *Ongoing:* Ph.D. **10**
Research Grants: SERB, DST, CSIR, MHRD & others since 2004 (Total ~ Rs. 3.5 crore)

ACHIEVEMENTS/AWARDS:

- Fellow, Indian Academy of Sciences, Bangalore 2018
- Dr. Basudev Banerjee Memorial Award of Indian Chemical Society in 2017
- CRSI Bronze medal awarded by Chemical Research Society of India (CRSI) for 2016
- Fellow, West Bengal Academy of Science and Technology, India 2014
- Elected Member, National Academy of Sciences, Allahabad, India 2013.
- Darshan Ranganathan Memorial Lecture Award of Chemical Research Society of India 2013.
- Profile featured in Chemical News Published by Indian Chemical Council, April 2011
- Nature India highlights: doi:10.1038/nindia.2009.293 & doi:10.1038/nindia.2014.102
- Visiting Professor, University of the Balearic Islands, Spain. May-July 2008.
- Proficiency Prize for the Best Project Work in Chemistry for Master's Project at IIT Kanpur in 1987. Adjudged the *best outgoing student in the Master's degree* for the year 1987.
- Kunja Behari Basak Medal in B.Sc. (Hons.) Part I - Presidency College, Calcutta.

PROFESSIONAL:

- Core committee (Early career research award and National PDF) Chemical Sciences, Science and Engineering Research Board, Government of India (2015- 2018); (2021 -)
- Council member of Chemical Research Society of India (2021 –)
- WEA Expert Committee (Women Excellence Award), Science and Engineering Research Board (SERB), Government of India (2020-)
- Core committee - Organic Chemistry committee PAC, SERB (2018-2021)
- Board of Governors, IIT Kharagpur (2013-2015)
- National Screening Committee for the 2011-2012 Fulbright-Nehru Doctoral and Professional Research Fellowships
- Women Scientist Committee (WOS-A) in Chemical Sciences, Department of Science and Technology, Government of India (2008- 2012)

ACS Omega Associate Editor (2018-2020) Editorial Advisory Board member (2021 -):
Protein and Peptide Letters Editorial Board Member (www.bentham.org/ppl)

RESEARCH ACTIVITIES:

Protein fibrillation/aggregation studies: Work related to the amyloid peptide $A\beta_{25-35}$ investigates the effect of additives on the fibrillation process, a hallmark of Alzheimer's disease. Fibrils from the $A\beta_{25-35}$ peptide and HSA are prepared *in vitro* at physiological temperature. Interactions of the monomeric and fibrillar forms of the peptides/proteins have been studied with surfactants, amino acid modifiers, osmolytes, model membranes and nanomaterials. Effects of a static electric field on the disruption of fibrils have also been reported.

Isolation and characterization of modified γ-crystallin (HGC^c): Modified γ-crystallin (HGC^c) has been isolated from the discarded cataractous emulsion of patients to check for altered amino acids. Studies showed that the major polyphenol present in green tea, EGCG was able to prevent tryptophan oxidation of the cataractous ocular lens human γ-crystallin in presence of H_2O_2. The cataractous eye protein isolate has been explored for the preparation of nanoparticles for possible drug/compound delivery carriers and a patent has been granted for the same. Protein films prepared from the discarded protein are being tuned for specific requirements. Studies on possible therapeutic potential of peptide fragments from the protein are underway.

Oxidative stress and Glycation in Proteins: Methods to combat oxidative stress in proteins are the topics of investigation. Monitoring dityrosine formation due to oxidative stress as well as the interaction of polyphenols and encapsulated polyphenols with proteins. The spectroscopic methods used for these studies involve UV-Vis, FTIR and fluorescence techniques. The effect of glycation on several proteins is being investigated to monitor effects on enzymatic activity and function. Reducing sugars have shown to be responsible for oligomer formation.

Protein nanoparticle interactions: The protein corona formation on gold nanospheres and nanorods are being investigated. The thermodynamic aspects of the interactions as well as structural changes of the protein are being monitored for human serum albumin. Intrinsically disordered regions of the protein are being purported to be involved in the interactions with the nanoparticles.

Protein ligand binding: Novel studies with angiogenin indicate that the process of angiogenesis, the capacity to form blood vessels, is inhibited by polyphenols. Altered modes of inhibition are observed on encapsulation and gold nanoparticle conjugate formation. Collaborative research in the development of inhibitors for Ribonuclease A is in progress considering logic based geometric and chemical complementarity. Presently, the protein Aromatase is being expressed and is under investigation for possible ways to modulate the testosterone/estradiol levels that play an important role in breast cancer.

TEACHING:

At the undergraduate level: First year Chemistry, Biochemistry, Numerical Methods and Computational Chemistry, other Physical Chemistry theory and laboratory courses

At the postgraduate level: Bioinformatics, Biophysical Chemistry

Biochemistry course available as a Video course from: NATIONAL PROGRAMME ON TECHNOLOGY ENHANCED LEARNING (NPTEL), Ministry of Human Resource Development, Government of India (Also available on http://www.youtube.com)

Number of hits 732,000+ for Lecture 1 as of September 2022

PUBLICATIONS FROM RESEARCH LABORATORY

1. Ghosh, P., Bag, S., Roy, P., Chakraborty, I., Dasgupta, S. (2022) Permeation of flavonoid loaded human serum albumin nanoparticles across model membrane bilayers. ***Int. J. Biol. Macromol.* 222,** 385-394. https://doi.org/10.1016/j.ijbiomac.2022.09.186
2. Panda, A., Roy, P., Goon, D., Kottala, H., De, S., Dasgupta, S., (2022) β-cyclodextrin encapsulation of curcumin elicits an altered mode of angiogenin inhibition: *In vitro* and *in vivo* studies. ***Int. J. Biol. Macromol.***, **208,** 654-666. doi.org/10.1016/j.ijbiomac.2022.03.127
3. Ghosh, P., Bag, S., Parveen, S., Subramani, E., Chaudhury, K., Dasgupta, S. (2022) Nanoencapsulation as a Promising Platform for the Delivery of the Morin-Cu(II) Complex: Antibacterial and Anticancer Potential, ***ACS Omega* 7,** 7931-7944. DOI: https://doi.org/10.1021/acsomega.1c0695600
4. Chowdhury, P., Parveen, S., Sarker, R., Dasgupta, S. (2021). Enhancing the properties of films prepared from the cataractous eye protein isolate (CEPI) for potential biomedical applications. ***Emergent Materials* 2(2)** DOI:https://doi.org/10.1007/s42247-021-00318-y
5. Panda, A., Karhadkar, S., Acharya, B., Banerjee, A., De, S., Dasgupta, S.; (2021) Enhancement of angiogenin inhibition by polyphenol-capped gold nanoparticles, ***Biopolymers,* 112,** e23429. DOI: 10.1002/bip.23429.
6. Tripathy, D. R., Panda, A., Dinda, A. K., Dasgupta, S. (2021) Positional preferences in flavonoids for inhibition of Ribonuclease A: Where "-OH" where? ***Proteins* 89,** 577–587.
7. Roy, P., Panda, A, Hati, S., Dasgupta, S. (2019) pH-Dependent Nitrotyrosine Formation in Ribonuclease A is Enhanced in the Presence of Polyethylene Glycol (PEG), ***Chem. Asian. J.* 14,** 4780-4792.
8. Parveen, S., Chowdhury, P., Dasmahapatra, U., Dasgupta, S. (2019). Biodegradable protein films from gallic acid and the cataractous eye protein isolate. ***Int. J. Biol. Macromol.,* 139,** 12-20.
9. Parveen, S., Chaudhury, S., Dasgupta, S. (2019). Tuning the mechanical and physicochemical properties of cross-linked protein films. ***Biopolymers***, 110, e23321 2.
10. Parveen, S., Ghosh, P., Mitra, A., Gupta, S., Dasgupta, S. (2019). Preparation, characterization and in vitro release study of curcumin loaded cataractous eye protein isolate films. ***Emergent Materials***, **2,** 475-486.
11. Roy, P., Parveen, S., Ghosh, P., Ghatak, K., Dasgupta, S. (2019) Flavonoid loaded nanoparticles as an effective measure to combat oxidative stress in Ribonuclease A. ***Biochimie* 162,** 185-197.
12. Konar, M., Mathew, A., Dasgupta, S. (2019) Effect of Silica Nanoparticles on the Amyloid Fibrillation of Lysozyme. ***ACS Omega* 4,** 1015-1026.
13. Roy, P., Bag, S., Chakraborty, D., Dasgupta, S. (2018) Exploring the Inhibitory and Antioxidant Effects of Fullerene and Fullerenol on Ribonuclease A. ***ACS Omega,* 3**, 12270-12283.
14. Konar, M., Ghosh, D., Roy, P., Dasgupta, S. (2018) Probing the role of ortho-dihydroxy groups on lysozyme fibrillation. ***Int. J. Biol. Macromol.* 109**, 619-628.
15. Chaudhury S., Dutta A., Bag S., Biswas P., Das A. K., Dasgupta S. (2018) Probing the inhibitory potency of epigallocatechin gallate against human γB-crystallin aggregation: Spectroscopic, microscopic and simulation studies, ***Spectrochim. Acta A*, 192**, 318-327.
16. Roy, P., Dinda, A. K.,Chaudhury, S.Dasgupta, S. (2018) β-cyclodextrin encapsulated polyphenols as effective antioxidants ***Biopolymers* 109,** 1-15.DOI: 10.1002/bip.23084
17. Bag, S., Mitra, R., DasGupta, S., Dasgupta, S. (2017) Inhibition of Human Serum Albumin Fibrillation by Two Dimensional Nanoparticles. ***J. Phys. Chem. B,* 121,** 5474-5482.
18. Konar, M., Bag, S., Roy, P., Dasgupta, S. (2017) Gallic acid induced dose dependent inhibition of lysozyme fibrillation. ***Int. J. Biol. Macromol.* 103,** 1224-1231.
19. Ghosh, P., Patwari, J., Dasgupta, S. (2017) Complexation with Human Serum Albumin facilitates sustained release of morin from polylactic-co-glycolic acid nanoparticles. ***J. Phys. Chem. B* 121**, 1758-1770.
20. Chaudhury, S., Roy, P., and Dasgupta, S. (2017) Green tea flavanols protect human γB-crystallin from oxidative photodamage. ***Biochimie* 137,** 46–55.

21. Chaudhury, S., Ghosh, P., Sultana, P., Dasgupta, S. (2017) Glycation of human γB-crystallin: A biophysical investigation. ***Int. J. Biol. Macromol.* 96**, 392-402.
22. Ghosh, P., Roy, A.S., Chaudhury, S., Jana, S.K., Chaudhury, K., Dasgupta, S. (2016) Solubility enhancement of morin and epicatechin through encapsulation in an albumin based nanoparticulate system and their anticancer activity against the MDA-MB-468 breast cancer cell line. ***RSC Adv.,* 6,** 101415-101429
23. Bag, S., Sett, A., DasGupta, S., Dasgupta, S. (2016) Hydropathy: the controlling factor behind the inhibition of Aβ fibrillation by graphene oxide. ***RSC Adv.,* 6**, 103242-103252. DOI: 10.1039/C6RA23570K
24. Chaudhury, S., Bag, S., Bose, M., Das, A. K., Ghosh, A. K, Dasgupta S. (2016) Protection of human γB-crystallin from UV induced damage by Epigallocatechin gallate: Spectroscopic and docking studies. ***Mol. BioSyst.* 12,** 2901-2909. DOI:10.1039/C6MB00256K.
25. Dinda, A. K., Chattaraj, S., Ghosh, S., Tripathy, D. R., Dasgupta, S (2016) DNA melting properties of the dityrosine cross-linked dimer of Ribonuclease A ***J. Photochem. Photobiol., B: Biology* 162,** 535-543.
26. Singha Roy, A., Samanta, S., Ghosh, P., Tripathy, D. R., Ghosh, S. K., Dasgupta, S. (2016) Cell cytotoxicity and serum albumin binding capacity of the morin-Cu(II) complex and its effect on deoxyribonucleic acid, ***Mol. BioSyst.*12,** 2818-2833. DOI:10.1039/C6MB00344C.
27. Bag, S., Chaudhury, S., Pramanik, D.,DasGupta, S., Dasgupta, S. (2016) Hydrophobic tail length plays a pivotal role in amyloid beta (25-35) fibril-surfactant interactions ***Proteins* 84,** 1213-1223.
28. Singha Roy, A., Tripathy, D. R., Samanta, S., Ghosh, S. K., Dasgupta, S. (2016) DNA damaging, cell cytotoxicity and serum albumin binding efficacy of the rutin-Cu(II) complex, ***Mol. BioSyst.,*12,** 1687-1701. DOI: 10.1039/C6MB00161K.
29. Singha Roy A., Ghosh P. Dasgupta, S. (2016) Glycation of human serum albumin affects its binding affinity towards (-)-epigallocatechin gallate, ***J. Incl. Phenom. Macrocycl. Chem.* 85,** 193-202. DOI: 10.1007/s10847-016-0619-y
30. Ghosh, P., Roy, A.S., Chaudhury, S., Jana, S.K., Chaudhury, K., Dasgupta, S. (2016) Preparation of albumin based nanoparticles for delivery of fisetin and evaluation of its cytotoxic activity, ***Int. J. Biol. Macromol.* 86**, 408-417.
31. Singha Roy A., Ghosh P. Dasgupta, S. (2015) Glycation of human serum albumin alters its binding efficacy towards the dietary polyphenols: A comparative approach. ***J. Biomol. Struct. Dyn.*** DOI: 10.1080/07391102.2015.1094749
32. Dinda, A. K., Tripathy, D. R., Dasgupta, S (2015) Glycation of Ribonuclease A affects its enzymatic activity and DNA binding ability. ***Biochimie*** , **118,** 162-172.
33. Chaudhury, S., Ghosh, I., Saha, G., Dasgupta, S.(2015) EGCG prevents tryptophan oxidation of cataractous ocular lens human γ-crystallin in presence of H_2O_2***Int. J. Biol. Macromol.* 77**, 287-292.
34. Ghosh, S., Pandey, N. K., Bhattacharya, S., Roy, A., Nagy, N. V., Dasgupta, S. (2015) Evidence of two oxidation states of copper during aggregation of hen egg white lysozyme (HEWL). ***Int. J. Biol. Macromol.* 76**, 1-9.
35. Tripathy, D. R., Pandey, N. K., Dinda, A. K., Ghosh, S., Singha Roy, A., Dasgupta, S. (2015) An insight into the ribonucleolytic and antiangiogenic activity of buffalo lactoferrin. ***J. Biomol. Struct. Dyn.*33**, 184-195.
36. Pandey, N. K., Ghosh, S., Tripathy, D. R., Dasgupta, S. (2015) Effect of temperature and solvent on fibrillation of human serum albumin. ***Prot. Pept. Letters* 22,** 112-118
37. Bhattacharya, S., Pandey, N. K., Roy, A., Dasgupta, S.(2014) Effect of (-)-epigallocatechin gallate on the fibrillation of human serum albumin. ***Int. J. Biol. Macromol.*70**, 312-319.
38. Ghosh, S., Pandey, N. K., Banerjee, P., Chaudhury, K. Nagy, N. V., Dasgupta, S. (2014) Copper(II) directs formation of toxic amorphous aggregates resulting in inhibition of hen egg white lysozyme fibrillation under alkaline salt mediated conditions. ***J. Biomol. Struct. Dyn.*** 1-17. DOI:10.1080/07391102.2014.921864]
39. Ghosh, S., Pandey, N. K., Dasgupta, S. (2014) Crowded milieu prevents fibrillation of hen egg white lysozyme with retention of enzymatic activity ***J. Photochem. Photobiol., B: Biology* 138**, 8-16.

40. Pandey, N.K., Ghosh, S., Nagy, N.V., Dasgupta, S. (2014) Fibrillation of human serum albumin shows nonspecific coordination on stoichiometric increment of Copper(II). ***J. Biomol. Struct. Dyn.*****32**, 1366-1378.
41. Dinda, A. K., Tripathy, D. R., Das, A., Dasgupta, S. (2014) Comparison of the ribonucleolytic activity of the dityrosine cross-linked Ribonuclease A dimer with its monomer in the presence of inhibitors. ***Int. J. Biol. Macromol.*****63**, 107–113.
42. Singha Roy, A.,Dinda, A. K., Chaudhury, S., Dasgupta, S.(2014) Binding of antioxidant flavonol morin to the native state of bovine serum albumin: Effects of urea and metal ions on the binding. ***J. Lumin.*** **145,** 741-751.
43. Pandey, N. K., Ghosh, S., Dasgupta, S. (2013) Fructose restrains fibrillogenesis in human serum albumin. ***Int. J. Biol. Macromol.*****61**, 424–432.
44. Ghosh, S., Pandey, N. K., Singha Roy, A., Tripathy, D. R., Dinda, A. K., Dasgupta, S. (2013), Prolonged glycation of hen egg white lysozyme generates non amyloidal structures. ***PLoS One*** **8**, e74336
45. Ghosh, S., Pandey, N. K.**,** Sen, S., Tripathy, D. R., Dasgupta, S. (2013) Binding of hen egg white lysozyme fibrils with nucleic acids. ***J. Photochem. Photobiol., B: Biology*****127,** 52-60
46. Pandey, N. K., Ghosh, S., Dasgupta, S. (2013) Effect of surfactants on preformed fibrils of human serum albumin. ***Intl. J. Biol. Macromol.*****59,** 39-45.
47. Bhattacharya, S., Ghosh, S., Roy, A., Dasgupta, S. (2013) Structural differences between native Hen egg white lysozyme and its fibrils under different environmental conditions. ***Spectrochim Acta A,*** **114,** 368–376.
48. Tripathy, D. R., Dinda, A. K., Dasgupta, S. (2013) A simple assay for the ribonuclease activity of ribonucleases in the presence of ethidium bromide. ***Anal. Biochem.*****437,** 126-129.
49. Ghosh, S., Pandey, N. K., Dasgupta, S. (2013) (−)-Epicatechin gallate prevents alkali-salt mediated fibrillogenesis of hen egg white lysozyme. ***Int. J. Biol. Macromol.*** **54**, 90-98.
50. Singha Roy, A., Tripathy, D. R., Chatterjee, A., Dasgupta, S. (2013) Influence of Common Metal Ions on the Interactions of the Isoflavone Genistein with Bovine Serum Albumin. ***Spectrochim Acta A,*** **102,** 393–402.
51. Singha Roy, A., Pandey, N. K., Dasgupta, S. (2013) Preferential binding of fisetin to the native state of bovine serum albumin: Spectroscopic and docking studies.***Mol. Biol. Rep.*****40,** 3239–3253
52. Singha Roy, A., Ghosh, K. S., Dasgupta, S. (2012) An investigation into the altered binding mode of green tea polyphenols with human serum albumin on complexation with Copper. ***J. Biomol. Struct. Dyn.*** **iFirst** 1-16.
53. Singha Roy, A., Tripathy, D. R., Ghosh, A.K., Dasgupta, S. (2012) An alternate mode of binding of the polyphenol quercetin with serum albumins when complexed with Cu(II). ***J. Lumin.,*****132,** 2943–2951.
54. Ghosh, S., Pandey, N.K., Bhattacharya, S.,Roy, A.,Dasgupta, S. (2012) Fibrillation of Hen Egg White Lysozyme triggers reduction of Copper(II) ***Intl. J. Biol. Macromol.*** **51,** 1-6.
55. Singha Roy, A., Dinda, A.K., Dasgupta, S. (2012) Study of the interaction between fisetin and human serum albumin: A biophysical approach. ***Prot. Pept. Letters*** **19,** 604-615.
56. Chandra, G., Tripathy, D. R., Roy, A., Dasgupta, S. (2012) Interaction of (-)-epigallocatechin gallate and silver colloid with bovine serum albumin ***Appl. Spectroscopy*****66,** 75-81.
57. Tripathy, D. R., Singha Roy, A., Dasgupta, S. (2011) Complex formation of rutin and quercetin with copper alters the mode of inhibition of Ribonuclease A. ***FEBS Lett.*** **585,** 3270-3276.
58. Singha Roy, A., Tripathy, D. R., Chatterjee, A., and Dasgupta, S. (2010) A spectroscopic study of the interaction of the antioxidant naringin with bovine serum albumin. ***J. Biophys. Chem.*** **1,** 141-152.
59. Pandey, N.K., Ghosh, S., Dasgupta, S. (2010) Fibrillation in Human Serum Albumin is enhanced in the presence of Copper(II). ***J. Phys. Chem. B*** **114,**10228-10233**.**
60. Sahoo, B.K., Ghosh, K.S. and Dasgupta S. (2009) An investigation of the molecular interactions of diacetylcurcumin with Ribonuclease A. ***Prot. Pept. Letters*** **12,**1485-1495**.**
61. Ghosh, K.S., Sen, S., Sahoo, B.K. and Dasgupta, S. (2009) A spectroscopic investigation into the interactions of 3′-O-carboxy esters of thymidine with Bovine Serum Albumin. ***Biopolymers 91,*** 737-744.

62. Sahoo, B.K., Ghosh, K.S. Bera, R. and Dasgupta S. (2009) Molecular Interactions of Isoxazolcurcumin with Human serum albumin: Spectroscopic and Molecular Modeling Studies***. Biopolymers* 91,** 108-119.
63. Ghosh K.S., Debnath J., Pathak, T. and Dasgupta S. (2008) Using Proton Nuclear Magnetic Resonance to study the mode of Ribonuclease A inhibition by competitive and noncompetitive inhibitors. ***Bioorg. Med. Chem. Lett.* 18,** 5503-5506.
64. Ghosh K.S., Sahoo B.K. Jana, D.and Dasgupta S. (2008) Studies on the interaction of copper complexes of (−)-epicatechin gallate and (−)-epigallocatechin gallate with calf thymus DNA. ***J. Inorg. Biochem.*, 102,**1711-1718.
65. Sahoo, B.K., Ghosh, K.S.Bera, R. and Dasgupta S. (2008) Studies on the interaction of diacetylcurcumin with calf thymus-DNA. ***Chem. Phys.* 351,**163-169.
66. Ghosh K.S., Debnath J., Dutta P., Sahoo B.K. and Dasgupta S. (2008) Exploring the potential of 3'-O-carboxy esters of thymidine as inhibitors of ribonuclease A and angiogenin. ***Bioorg Med Chem.*16,** 2819-2828.
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68. Maiti, T.K., Ghosh, K.S., Samanta A. and Dasgupta S. (2008) The interaction of Silibinin with Human serum albumin: A spectroscopic investigation. ***J. Photochem. Photobiol. A: Chemistry* 194,** 297-307.
69. Sahoo, B.K., Ghosh, K.S.and Dasgupta S. (2008) Investigating the binding of curcumin derivatives to bovine serum albumin ***Biophysical Chemistry* 132**, 81-88.
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71. Ghosh, K.S.,Maiti, T.K., Debnath, J. and Dasgupta S. (2007) Inhibition of Ribonuclease A by polyphenols present in green tea. ***Proteins* 69,** 566-580.
72. Ghosh, K.S.,Maiti, T.K., Mandal A. and Dasgupta S. (2006) Copper complexes of (-)-Epicatechin gallate and (-)-Epigallocatechin gallate act as inhibitors of Ribonuclease A. ***FEBS Lett.* 580,**4703-4708**.**
73. Maiti, T.K., Ghosh, K.S. and Dasgupta S. (2006) Interaction of (-)-Epigallocatechin-3-Gallate With Human Serum Albumin: Fluorescence, Fourier Transform Infrared, Circular Dichroism, and Docking Studies ***Proteins* 64,** 355-362.
74. Maiti, T.K., Ghosh, K.S.,Debnath, J.and Dasgupta S. (2006) Binding of a*ll-trans* Retinoic acid to human serum albumin: Fluorescence, FT-IR and Circular dichroism studies. ***Intl. J. Biol. Macromol.*38,** 197-202.
75. Maiti, T. K, De, S., Dasgupta, S. and Pathak, T. (2006) 3′-*N*-Alkylamino-3′-deoxy-ara-uridines: A new class of potential inhibitors of ribonuclease A and angiogenin. ***Bioorg. Med. Chem.* 14,** 1221–1228.
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77. De, S., Sur, K. and Dasgupta, S. (2005) Characterization of the Non-regular Regions of Proteins by a Contortion Index. ***Biopolymers*79,** 63–73.
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80. Maiti, T.K., Chatterjee, J. and Dasgupta S. (2003) Effect of green tea polyphenols on angiogenesis induced by an angiogenin-like protein. ***Biochem. Biophys. Res. Comm.* 308**, 64-67.
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PUBLICATIONS FROM COLLABORATIVE RESEARCH

83. Das, A., Dasgupta, S., Pathak, T. (2022) Crescent-shaped meta-Substituted Benzene Derivatives as a New Class of Non-Nucleoside Ribonuclease A Inhibitors. ***Bioorganic & Medicinal Chemistry (accepted)***
84. Das, A., Dasgupta, S., Pathak, T. (2020) Design of Configuration-Restricted Triazolylated β-D-Ribofuranosides: A Unique Family of Crescent-Shaped RNase A Inhibitors. ***Org. Biomol. Chem.***, **18,** 6340-6356.
85. Singh, A.K., Bhattacharya, S., Halder, K., Dasgupta, S., Roy, A. (2020) Restriction of microwave-induced amyloid fibrillar growth by gold nanoparticles. ***Intl. J. Biol. Macromol.*** **151,** 212-219.
86. Apoorva, A., Rameshbabu, A.P., Dasgupta, S., Dhara, S., Padmavati, M. (2020) Novel pH-sensitive alginate hydrogel delivery system reinforced with gum tragacanth for intestinal targeting of nutraceuticals. ***Intl. J. Biol. Macromol.*** **147,** 675-687.
87. Datta, D., Dasgupta, S., Pathak, T. (2019) Sulfonic nucleic acids (SNAs): a new class of substrate mimics for ribonuclease A inhibition. ***Org. Biomol. Chem.***, **17**, 7215-7221
88. Das, M., Roy Chaudhuri, S., Basak, D., Dasgupta, S., Ray, D. (2019) Inhibition of ligand arm hydrolysis and carboxylate coordination directed formation of μ4-oxido-bridged [Cu4] complexes: Synthesis, X-ray structure and functional activity. ***Inorg. Chim. Acta*** **485**, 140-154.
89. Sett , A., Ayushman, M., Dasgupta, S., DasGupta, S. (2018) Analysis of the Distinct Pattern Formation of Globular Proteins in the Presence of Micro- and Nanoparticles. ***J. Phys. Chem. B*****, 122,** 8972–8984.
90. Singh, A. K., Burada, P. S., Bhattacharya, S., Bag, S., Bhattacharya, A., Dasgupta, S., Roy, A. (2018) Microwave-radiation-induced molecular structural rearrangement of hen egg-white lysozyme ***Phys. Rev. E*** **97,** 052416
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EARLIER PUBLICATIONS

156. Iyer, G.H., Dasgupta, S. and Bell, J.A. (2000) Ionic Strength and Intermolecular Contacts in Protein Crystals**.** ***J. Cryst. Growth*****217,** 429-440.
157. Dasgupta, S.,Iyer,G. H., Bryant, S. H.,Lawrence, C. E., Bell, J. A. (1997) Extent and Nature of Contacts between Protein Molecules in Crystal Lattices and between Subunits in Protein Oligomers. ***Proteins*****,28,** 494-514.
158. Dasgupta, S. and Bell, J.A. (1993) Design of helix ends: Amino acid preferences, hydrogen bonding and electrostatic interactions, ***Int. J. Peptide Protein Res***.**41,** 499-511.

PATENTS

PATENT GRANTED Indian Patent No: 359959 dated March 1, 2021
(Indian Patent Application No: 201631000088)
Title: PREPARATION OF NANOPARTICLES DERIVED FROM CATARACTOUS EYE PROTEIN ISOLATE
PATENT OF ADDITION (Indian Patent No: 359959)
Indian Patent Application No.: 201733014122 dated April 20, 2017
in the name of INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR
Title: PROTEIN FILMS MADE FROM CATARACTOUS EYE PROTEIN
Inventors: Prof. Swagata Dasgupta, Mr. Susmitnarayan Chaudhury, Ms. Sultana Parveen

LIST OF ONGOING PROJECTS

1. Targeting the Active Site of Aromatase: Chemical Logic Based Design of Potential Anticancer Steroidal and Non-Steroidal Inhibitors Dec 2021; Rs. 51.7 L SERB [CRG/2021/004375]
2. Poly lactic-co-glycolic acid (PLGA) based nanoparticles for delivery of polyphenols and effect of human serum albumin (HSA) on their release property and antioxidant property. May 2018; Rs 14.74L CSIR (PI) [01(2959)/18/EMR-II] – Extended till April 2022

LIST OF COMPLETED PROJECTS

1. A study to the centre of ribonucleases: designing of nucleoside - based inhibitors. Oct 2014; Rs 46.18L DBT [BT/PR6189/BRB/10/1150/2012]
2. Isolation of proteins for further use from discarded cataractous eye emulsion and identification of structural changes in human gamma crystallin due to oxidative stress. Apr 2014; Rs 46.90L MHRD [F. NO. 4-23/2014-TS.I]
3. Development of novel biodegradable metallo - curcumin nanoparticles - a new hope for endometriosis therapy. May 2014; Rs 54.15L SERB [SR/SO/HS-0058/2011]
4. Molecular structural evolution of nanoparticles mediated amyloid fibrils. Oct 2014; Rs 18.70L SERB [SR/NM/NS-25/2012(G)]
5. Investigation of the self association of proteins under varying conditions. June 2013; Rs 31.70L DST (PI)
6. Droplet based screening of amyloid beta peptide aggregation. Oct 2010;Rs49.50L DBT (PI) [BT/PR13931/MED/32/141/2010]
7. Identification of potential biomarkers for the diagnosis of endometriosis: a proteomics approach. June 2010; Rs 25.20L DST (Co-PI) [SR/SO/HS-22/2008]
8. Studies on Protein-Metal Colloid Interactions by Raman Spectroscopy. April 2009; Rs 20.96L DST (Co-PI) [(SR/NM/NS-80 /2008)]
9. Interaction of dietary polyphenols and their copper complexes with human serum albumin. May 2008; Rs 29.00L DST (PI) [(SR/SO/BB -54 /2007)]
10. Design of 'anion recognition' short peptide motifs: an approach towards designing 'model scaffolds' for binding. Apr 2008; Rs 3.20L DBT (Co-PI) [(BT/PR10277/GBD/27/90/2007]
11. Studies on copper complexes of green tea polyphenols and their effects on the activities of ribonuclease A and angiogenin. Oct 2007; Rs 9.00L CSIR (PI) [(01(2115)/07/EMR-II)]
12. Upgrading Raman spectrometer to micro-Raman spectrometer for studies on bio-materials. Nov 2006; Rs 49.79L DRDO (Co-PI)
13. Isolation and characterization of angiogenin from goat plasma: a study on the effect of green tea components on angiogenin induced angiogenesis. July 2004;Rs8.96L CSIR (PI) [(37(1188)/04/EMR-II)]
14. Design of inhibitors of angiogenin, a blood vessel inducing protein. Apr 2004; Rs 11.00L MHRD (PI)
15. Studies on the interaction of dinucleotides on an angiogenic protein from goat plasma. Oct 2003; Rs9.09 L DST (PI) [(SR/FTP/LS-A-06/2001)]
16. Inhibition of the ribonucleolytic activity of angiogenin with backbone modified dinucleotides: a new approach to cancer chemotherapy. May 2003;Rs 24.68L DST (Co-PI) [SR/S5/OC-13/2002]
17. Isolation of gamma crystallin: Understanding factors leading to opacity of the eye lens. 1999-2001; Rs 1.00L ISIRD IIT Kgp (PI)
18. Binding studies on angiogenin. 1998-2000. Rs 2.96L DST (PI) (HR/OY/C-16/96)

Selected Lectures and Presentations

1. Gordon Research Conference on Intrinsically Disordered Proteins. Poster presentation "Do the intrinsically disordered regions of HSA interact with nanoparticles?" June 2022, Les Diablerets, Switzerland.
2. ACS Science Talks: Oxidative damage in proteins Jan 2021
3. Invited lecture "The Role of Antioxidants on the Oxidative Damage of Proteins" Frontier Symposium in Chemistry 2020, January 17-18, 2020 IISER Thiruvanthapuram, India.
4. Invited lecture "Looking out for Green tea polyphenols" IIT Bombay Diamond Jubilee Chemistry Symposium. February 25-28, 2019. IIT Bombay, India.
5. Invited lecture "From your eyes only", Indian Academy of Sciences for the ACADEMY–ACS Publications Forum, Expanding Frontiers in Chemical Sciences, Nov 1, 2018, Banaras Hindu University, Varanasi, India.
6. Invited lecture as Fellow, Indian Academy of Sciences: "The evolving story of polyphenol protein interactions" Mid-year meeting Indian Academy of Sciences 29-30, May 2018. Infosys Development Centre, Mysore.
7. Invited lecture: "Protection of cataractous human γ-crystallin and human γB-crystallin fromUV induced sdamage" National Conference on"Biomolecular Dynamics:Experimental and Theoretical Perspectives (BDETP-2017)"(22nd Biennial Indian Photobiology Society Conference) during 18-20th December 2017.NIT Rourkela
8. Invited lecture: "Effects of external factors on protein fibrillation", Facets of Chemical Biology (FOCB 2016), February 21-22, 2016. St. Xavier's College, Kolkata.
9. Bronze medal lecture:"RibonucleaseA: Effects of Dimerization & Glycation"at the 18th National Symposium in Chemistry of CRSI, February 4-7, 2016 in Chandigarh, India.
10. Invited lecture: "Dimerization of Ribonuclease A: Effect on Enzymatic Activity, Ribonuclease Inhibitor and DNA Binding"at26th International Symposium on Pharmaceutical and BiomedicalAnalysis, July 5-8, 2015in Tblisi, Georgia.
11. Invited lecture: "Amyloid formation of human serum albumin and lysozyme: effect of Cu(II) and green tea polyphenols" Indian Biophysical Society, MADALS 2014, Feb 7-10, 2014.
12. Darshan Ranganathan Memorial Lecture Award of Chemical Research Society of India, at CRSI Symposium, BHU, India Feb, 1-3, 2013.
13. Invited talk: "Protein Fibrillation: Effect Of Copper (II) On The Fibrillation Of Human Serum Albumin"July 22-24, 2011, CRSI-IYC-2011 Zonal Meet (East) University of North Bengal, Darjeeling 734 013, India.
14. Oral presentation:"Interactions of Biomacromolecules with Naturally Occurring Polyphenols: Prospects for Inhibitor Design" at Gordon Research Conference on Biomolecular Interactions & Methods, Jan 17-22, 2010 Galveston, TX, USA.
15. CRSI Workshop lecture "Green tea polyphenolic inhibitors of Ribonuclease A affect Angiogenesis induced by Angiogenin". IIT Kharagpur Local Chapter, August 2007
16. Invited lecture "Developing inhibitors for the ribonuclease superfamily". Indian Photophysical Society, Kolkata, January 2007.
17. Oral presentation: "Enhancement Of Fibrillation In Human Serum Albumin In Presence Of Copper (II)" at the XXIII. International Conference on Coordination and Bioinorganic Chemistry (ICCBIC), 5-10 June 2011, Smolenice Castle, Slovak Republic.
18. Invited Talk: Technobia '09: A National Conference On Stemcell Research, Computational Biology And Chemistry. Chennai August 8-9, 2009.
19. "Design and development of inhibitors for the ribonuclease family." Department of Chemistry, Universitat de les Illes Balears. Palma (Illes Balears), Spain. May 21, 2008.
20. Invited Speaker, An analysis of Ω loops in proteins, International Symposium on NMR, Drug Design & Bioinformatics, NMRS 2004, February 17-20, 2004, Kolkata, India

Selected Presentations by students

1. Krishna Halder, Swagata Dasgupta (2022) **Effect of variation of nanoparticle concentration on protein corona formation.** Abstracts of Papers, Spring 2022 ACS National Meeting, In person & Virtual, San Diego, CA, United States, Mar 20-24, 2022 **COLL-3658213.**
2. Prasun Chowdhury, Sultana Parveen, Swagata Dasgupta (2022) **Enhancing the properties of the film of the cataractous eye protein isolate (CEPI).** Abstracts of Papers, Spring 2022 ACS National Meeting, In-person & Virtual, San Diego, CA, United States, Mar. 20-24, 2022 **PMSE-3658392.**
3. Atashi Panda, Swagata Dasgupta (2019) **Inhibitory effect of green tea catechins on recombinant human angiogenin.** Abstracts of Papers, 257th ACS National Meeting & Exposition, Orlando, FL, United States, Mar. 31-Apr. 4, 2019 **BIOL-0068.**
4. Pampa Mondal, Swagata Dasgupta, Tanmaya Pathak (2019) **Inhibition of ribonucleolytic activity of RNase A by triazolylated thymidines**. Abstracts of Papers, 257th ACS National Meeting & Exposition, Orlando, FL, United States, Mar. 31-Apr. 4, 2019, **ORGN-0364.**
5. Mouli Konar,Swagata Dasgupta (2018) **A New Insight into the Molecular Mechanism of the Inhibition of Lysozyme Fibrillation by Gallic Acid.** Abstracts of Papers, 62nd Annual Meeting, Biophysical Society, San Francisco, CA, United States, February17-21, 2018,**1158-Pos.**
6. Sultana Parveen, Swagata Dasgupta (2018) **Applications of Cross-Linked Cataractous Eye Protein Isolate Films as Drug Delivery Vehicles.** Abstracts of Papers, 62nd Annual Meeting, Biophysical Society, San Francisco, CA, United States, February 17-21, 2018, **1781-Pos.**
7. Pritam Roy, Swagata Dasgupta (2018) **Can β-Cyclodextrin Encapsulated Polyphenols Combat Oxidative Stress? A Case Study with Ribonuclease a Protein.** Abstracts of Papers, 62nd Annual Meeting, Biophysical Society, San Francisco, CA, United States, February 17-21, 2018, **1987-Pos.**
8. Pooja Ghosh, Swagata Dasgupta (2017) **Albumin based nanoparticles as a delivery vehicle for flavonoids and their anticancer activity** Abstracts of Papers, 253rd ACS National Meeting & Exposition, San Francisco, CA, United States, April 2-6, 2017, **PHYS-483.**
9. Sudipta Bag, Sunando DasGupta, Swagata Dasgupta (2017) **Prevention of fibrillation of the amyloid-β (25-35) peptide by graphene oxide.** Abstracts of Papers, 253rd ACS National Meeting & Exposition, San Francisco, CA, United States, April 2-6, 2017, **PHYS-431.**

Ph.D. supervision (sole supervision)

	Name of scholar	*Current Position*
1.	Tushar Kanti Maiti (2005)	Professor, Regional Centre for Biotechnology, NCR Biotech Science Cluster, Faridabad, 121001, India.
2.	Kalyan Sundar Ghosh (2009)	Assistant Professor, Department of Chemistry, National Institute of Technology, Hamirpur, HP India
3.	Bijaya Ketan Sahoo (2009)	Assistant Professor, Department of Chemistry, School of Technology, GITAM, Hyderabad Campus, India
4.	Atanu Singha Roy (2013)	Assistant Professor, Department of Chemistry, NIT Meghalaya. India
5.	Nitin Kumar Pandey (2014)	Assistant Professor of Research Physiology and Neuroscience, Health Sciences Campus. Keck School of Medicine, University of Southern California, USA.
6.	Sudeshna Ghosh (2014)	DST-Inspire Faculty, Department of Chemistry, IIT Kanpur. India
7.	Debi Ranjan Tripathy (2014)	Engaged in entrepreneurship activities
8.	Amit Kumar Dinda (2016)	Postdoctoral fellow, Indian Institute of Science (IISc), Bangalore, India.
9.	Susmitnarayan Chaudhury (2017)	Postdoctoral Fellow, Los Alamos National Laboratory, USA
10.	Pooja Ghosh (2018)	Research Associate, Polymer Research Center, Department of Chemical Sciences, IISER Kolkata
11.	Mouli Konar (2019)	Ex Research Associate, JNCSAR Bangalore
12.	Pritam Roy (2020)	Postdoctoral Associate, University of Illinois at Urbana-Champaign, USA
13.	Sultana Parveen (2020)	Currently searching for a position

Ph.D. supervision (*joint supervision)

	Name of scholar	*Current Position*
1.	Chandi Charan Mandal* (2006)	Professor & Head, Department of Biochemistry, School of Life Sciences, Central University of Rajasthan. India
2.	Annapurna Kumari* (2008)	Head, Chemistry Department, Jamshedpur Women's College, Jamshedpur India
3.	Joy Debnath* (2010)	Senior Assistant Professor at SASTRA Deemed University, Tamil Nadu. India
4.	Anirban Samanta* (2010)	NIPER, Ahmedabad, India
5.	Sansa Dutta* (2011)	Former Assistant Professor, Adamas University, Kolkata India (former Postdoctoral fellow Weizmann Institute, Israel)
6.	Rashmi Mukherjee* (2012)	Former Project Assistant, IIT Kharagpur
7.	Dhrubajyoti Datta*(2014)	Post Doc Research Associate, Department: Drug Innovation, Alnylam Pharmaceuticals Inc., Cambridge, MA, USA
8.	Kaustav Chakrabarty* (2015)	Research Scientist & Leader (Polymer Synthesis), Solvay Research & Innovation Center, Vadodara, Gujarat India
9.	Susmita Bhattacharya* (2015)	Postdoctoral fellow, Indian Institute of Science (IISc), Bangalore, India.
10.	Mainak Datta*(2016)	Assistant Professor, Dept. of Biotechnology, BITS Pilani-Dubai campus, Dubai, UAE
11.	Moumita Gangopadhyaya* (2017)	Assistant Professor, Ghatal Rabindra Satabarsiki Mahavidyalaya, West Bengal, India
12.	Sudipta Bag* (2018)	Assistant Professor, Department of Chemistry, Sister Nivedita University, New Town, Kolkata, India.
13.	Ayantika Sett* (2019)	Assistant Professor, ICT Mumbai, Bhubaneswar campus.
14.	Anupam Apoorva* (2020)	Postdoctoral researcher in the Perlman School of Medicine, University of Pennsylvania, USA
15.	Hemant Kumar Srivastava* (2021)	Postdoctoral fellow in the Baylor College of Medicine, USA
16.	Anang Kumar Singh* (2021)	Postdoctoral associate at IIT Bombay

Ph.D. Ongoing		
1.	Ashrukana Das*	Thesis submitted
2.	Atashi Panda*	Thesis submitted
3.	Pampa Mandal*	Registration completed
4.	Prasun Chowdhury	Registration completed
5.	Krishna Halder	Registration completed
6.	Sreshtha Chaki	Registration completed
7.	Atri Sen	Courses ongoing
8.	Kabira Sabnam	Courses ongoing
9.	Tridib Samanta	Courses ongoing
10.	Sujan Santra	Courses ongoing

* joint supervision

Extracurricular activities:

- Article: Darshan Ranganathan, appeared in Resonance, published by the Indian Academy of Sciences, June 2022
- Women's Council Chairperson, IIT Kharagpur (2017-2020)
- https://www.thestatesman.com/technology/science/nanoparticles-from-cataract-lens-waste-for-safer-drug-delivery-165611.html
- DST-JBNSTS INSPIRE Science Camp lecture for JBNSTS scholars, 2013
- General Article: Chemistry is Evergreen 2008 Nobel Prize in Chemistry, appeared in Resonance, published by the Indian Academy of Sciences, March 2009
- Popular Lecture for IBM EXITE program to motivate girls into Science, October 2005
- Article for "Now and Again" appeared in The Statesman Editorial page June 7, 2004
- Women's Sports Champion, Presidency College, Calcutta 1984