UGIR HOSSAIN SK, PhD
Scientist Fellow, Assistant Professor-AcSIR
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Highly accomplished researcher able to apply hands-on knowledge of synthesis of bioactive small molecules/ macromolecular drug-polymer conjugation for therapeutics, and their biological applications, offer key insights to multidisciplinary teams, follow laboratory safety procedures, open minded and effectively communicate chemistry strategies about project goals. Ph.D. in Organic Chemistry with proven abilities in solving critical project issues, utilizing chemical databases and maintaining detailed documentation. My research and teaching interested are in the multi-discipline areas like medicinal chemistry, drug delivery, and pharmacology.

PROFESSIONAL EXPERIENCE

1. Scientist Fellow and Assistant Professor-AcSIR: Institute of Himalayan Bioresource Technology-CSIR**,** Department of Natural Product Chemistry and Process Development (since July 2015-)

Research areas: Work includes the area of Medicinal chemistry and Nanotechnology-based drug delivery. In my recent work, I am developing dendrimer conjugated combination therapy molecules attached with targeting ligand and imaging probe to target tumor tissue specifically. In another objective, I have involved in the development of the drug delivery carrier based on the edible natural product of having stimuli responsive drug release pattern and further modification for the drug conjugation. After synthesizing these nanodevices, their sustained release characteristic, in vivo and in-vitro evaluation against cancer is carried out. I am also involved in synthesizing complex small molecules for the interest of bioactive molecules against cancer.

2. DST-Young Scientist, Principal Investigator, Assistant Professor: Institute of Himalayan Bioresource Technology-CSIR**,** Department of Natural Plant Product, **India** (August 2012-2015)

Research area: Synthesis of well-known anticancer drugs to the polymers as nanodevices (like PEG and Dendrimer) for the interest of drug delivery. DST- Fast Track Scheme for Young Scientist proposal. Total Grant value: 26 lakhs

3. Visiting Researcher: With TAKEDA Science Foundation Postdoctoral Fellowship, **Japan**. (April 2012- Sept. 2013)

Research area: My work involves the synthesis of polymer conjugated tumor homing peptide and imaging agent for the development of drug delivery system.

4. Research Associate: Wayne State University, Dept. of Chemical Engineering and Material Science, Detroit, MI, **USA** (From January 2011- December 2011)

Research area: My work was to synthesize ligand-drug-polymer conjugated nanoparticles against different diseases including cancer and their applications in drug delivery. The newly synthesized polymeric nano-devices were characterized by NMR, MALDI-TOF, SEC, DLS, HPLC, and TEM.

5. Post doctoral Research Associate, Penn State Hershey College of Medicine, Penn State Cancer Institute, Department of Pharmacology, 500 University Drive, Hershey, PA, **USA** (November 2007-December 2010)

Research area: I worked as a post-doctoral researcher at the Department of Pharmacology, College of Medicine; Penn State Cancer Institute in Dr. Amin's laboratory. My research involves medicinal chemistry associated with anti-cancer and anti-asthmatic drug development program. My main focus was the development of an anti-cancer drug designed on the basis of natural products or lead compounds obtained from chemical library screenings. My major work in this laboratory was to synthesize these novel compounds and screen for their anti-cancer (breast, melanoma, lung, colon, and brain) activities *in vivo* (in mice or rat model) and *in vitro* (in cancer cell lines).

6. Post doctoral Research Associate, National Brain Research Centre, India (April 2007- October 2007)

Research area: I worked as a post-doctoral fellow in Dr. Ellora Sen laboratory at NBRC. My research was directed towards investigating the potential of organoselenium compounds as chemotherapeutic agents in glioblastoma (the most malignant form of brain tumor). The effects of these compounds on the proliferation, migration, and regulation of redox homeostasis were investigated.

EDITORIAL BOARD MEMBER

Scientific Reports since 2015-

AWARDS / HONORS

- Qualified in NET (National Eligibility Test, CSIR, INDIA, 2002)
- Qualified in GATE (97.01 percentile) (Graduate Aptitude Test in Engineering, INDIA, 2002)
- Postdoctoral research fellowship (National Brain Research Institute, INDIA, 2007)
- Postdoctoral research fellowship (Penn-state University, USA 2007-2010)
- Postdoctoral research fellowship (Wayne State University, USA, 2011, one year)
- DST- Fast Track Scheme for Young Scientist proposal.(2012-2015, Total Grand value: 26 lakhs)
- TAKEDA Science Foundation postdoctoral International Fellowship, (2012)

GRANT RECEIVED

DST- Fast Track Scheme for Young Scientist proposal. (2012-2016, Total Grand value: 26 lakhs)

TEACHING ACTIVITIES

I have appointed as an Assistant Professor of the AcSIR (Academy of Scientific & Innovative Research) since 2013. I am teaching Organic Chemistry/ Medicinal Chemistry and Pharmacology class to the Pre-PhD course work. Student feedbacks about my teaching caliber are excellent.

INTERNATIONAL REVIEWER

- Letters in Drug Design & Discovery, 2014
- Pharmaceutical Biology 2014
- BioNanoScience 2013
- International Journal of Nanomedicine, 2014
- Scientific Reports
- Current Medicinal Chemistry
- European Journal of Medicinal Chemistry

INTERNATIONAL GRANT REVIEWER

Evaluation of the research proposal from National Science Centre, Poland since 2014-

EDUCATIONAL EXPERIENCE

Ph.D. (2002-2007) Jadavpur University, Kolkata, West Bengal, INDIA

Supervisor: Dr. Sudin Bhattacharya, Dept. of Cancer Chemoprevention, Chittaranjan National Cancer Institute, Kolkata, INDIA.
Title of Thesis: Synthesis and evaluation of anti-oxidative properties of some organoselenium and thiazolidinedione derivatives
M.Sc. (Chemistry, Organic Chemistry major) **(1999-2001), Jadavpur University, INDIA**

B. Sc. Chemistry (Hons.) (1996-1999), University of Burdwan, INDIA

RESEARCH EXPERIENCES

1. Synthesis of the natural product based macromolecular system of multifunctional drug delivery carrier. (multistep synthesis of organic molecules)
2. Synthesis of PAMAM-dendrimer (Polymer) conjugates/ polymer conjugated dye, targeting ligand and drug.
3. Experience in purification (dialysis, size exclusion chromatography and semi-prep reverse phase HPLC and characterization (NMR and MALDI-TOF), TEM of dendrimer-drug nanodevices

4. Peptide-based elastin mimetic polymer synthesis, elastic properties evaluation.
5. Synthesis of multi-steps molecules (Oxidation, reduction, addition, elimination, hydrogenation protection- de-protection, deuterium incorporation within the molecule).
6. Synthesis of long-acting β compounds, Sphingosine Kinase Inhibitors (anti-cancer)
7. Several isothiocyanates, isoselenocyanate, thiourea, isos Lenore derivative for anti-cancer drug (anti-melanoma cancer)
8. NMR (1D and 2D), HPLC, FT-IR, Mass, MALDI-TOF, GPC based chemical analysis
9. Animal handling: Swiss Albino mice, Swiss Webster mice, Athymic nude mice, solid tumor formation, IP injection, skin papilloma formation and surgical expertise.
10. Biochemical estimation of Phase II detoxifying enzyme in vivo.
11. Basic cell culture assay (with different cancer cells)
12. Western blot analysis.
13. Histopathology

Google Scholar citation

Citation indices	All	Since 2013
3Citations	677	444
h-index	15	13
i10-index	27	22

LIST OF PUBLICATIONS

(* Corresponding author)

1. A R Patra, S. S Roy, A Basu, A Bhuniya, A Bhattacharjee, S Hajraa, **U. H. Sk**, R Baral, S Bhattacharya. Design and synthesis of coumarin-based organoselenium as a new hit for myeloprotection and synergistic therapeutic efficacy in adjuvant therapy. **Scientific reports** 8(1): 2194, **2018**
2. V Patial, S Sharma and **U H Sk***. Dendrimer conjugated estramustine nano crystalline 'DenDot': An effective inhibitor of DMBA-TPA induced papilloma formation in mouse. **Eur J Pharm Sci.**, 109, 316-323, **2017**.
3. D N. Karelia, **U H Sk**, P Singh, A. S. P Gowda, M K. Pandey, S R Ramisetti, S Amin, A K Sharma, Discovery of a Dual Topoisomerase-IIα and Akt Pathway Inhibitor NISC-6 as Potential Melanoma Therapeutic. **European Journal of Medicinal Chemistry**. **2017,** 135:282-295.
4. **U. H. Sk** *, Nanosize dendrimers: potential use as carrier and antimicrobials, **ANTIMICROBIAL NANOARCHITECTONICS** (ELSEVIER, UK). Editor: Alexandru Mihai Grumezescu Book Chapter; Invited. **2017, Chapter 12, 323-355.**
5. Kojima C, **Sk U. H**, Fukushima D, Irie K, Akazawa N, Umeda M, Niidome T. Effect of Main Chain Conformation to Thermosensitivity in Elastin-Like Peptide-Grafted Polylysine. **RSC Advanced**. **2015, 5, 104900-104906**
6. **U. H. Sk***, V. Patial, S. Sharma. Low toxic synthetic dendrimer conjugated podophyllotoxin nanodevice with potent antitumor activity against DMBA/TPA induced mouse skin carcinogenesis model. **Toxicology Research**. **2015**, 4, 1204-1213. **DOI:** 10.1039/C5TX00112A
7. **U. H. Sk**, C. Kojima. Dendrimers for theranostic applications. **BioMolecular Concepts**. **2015**, 6(3):205-17
8. D. Fukushima, **U.H. Sk**, Y. Sakamoto, I. Nakase, C Kojima Dual Stimuli-Sensitive Dendrimer: Photothermogenic Gold Nanoparticle-Loaded Thermo-Responsive Elastin-Mimetic Dendrimers. **Colloids and Surfaces B: Biointerfaces**. **2015, 132,155–160**.
9. **U. H. Sk**, C. Kojima. Dendrimers for Drug Delivery of Anticancer Drugs. **Frontiers in Clinical Drug Research- Anti Cancer Agents**, Bentham Science Publishers, Invited Article, Vol. 2, P3-25, **2015**.
10. **U. H Sk***, D. Dixit, E. Sen. Comparative study of microtubule inhibitors- Estramustine and natural Podophyllotoxin conjugated PAMAM dendrimer on glioma cell proliferation. **Eur J Med Chem.** 68, 47-57, August, **2013.**
11. **U. H. Sk**, S. P. Kambhampati, M. K. Mishra, W. G. Lesniak, F. Zhang, R. M. Kannan. Enhancing the Efficacy of Ara-C through Conjugation with PAMAM Dendrimer and Linear PEG: A Comparative Study. **Biomacromolecules.** 14, 3, 801-810, February **2013**.
12. J.K.Das, S.Sarkar, **U. H. Sk**, P. Chakraborty, R. K. Das, S. **Bhattacharya.** Diphenylmethyl selenocyanate attenuates malachite green induced oxidative injury through antioxidation and inhibition of DNA damage in mice. **Indian J Med Res. 137, 1163-1173,** June **2013.**

13. Y. Cheng, **U. H. Sk**, Y. Zhang, X. Ren, L. Zhang, K. J. Huber-Keener, Y.-W. Sun, S. Amin,A. K. Sharma, J.-M. Yang. Rational incorporation of selenium into temozolomide elicits superior antitumor activity associated with promotion of both apoptotic and autophagic cell death, **PloS One,**7, 4, e35104, April, 2012.
14. **U. H. Sk**, A.S. P. Gowda, J. K. Yun, T. E. Spratt, S. Amin, A. K. Sharma, Development of novel naphthalimide derivatives and their evaluation as potential melanoma therapeutics, **Eur J Med Chem.,** 46, 8, 3331-3338, August 2011.
15. J. A. Hengst, X. J. Wang, **U. H. Sk**, A. K. Sharma, S. Amin, J. K. Yun. Discovery and Evaluation of a Sphingosine Kinase 1 Specific Small molecule Inhibitor, **Bioorg Med Chem Lett.** 20, 24, 7498- 7502, Dec., 2010.
16. S. S. Roy, P. Ghosh, **U. H. Sk**, P. Chakraborty, J. Biswas, A. Bhattacharjee, S. Bhattacharya Naphthalimide based novel organo selenocyanates: Finding less toxic forms of selenium that would retain protective efficacy, **Bioorg Med Chem Lett.** 20, 23, 6951-6955, Dec., 2010.
17. P. Chakraborty, S. S. Roy, **U. H. Sk**, S. Bhattacharya. Amelioration of cisplatin induced nephrotoxicity in mice by oral administration of diphenylmethyl selenocyanate, **Free Radic Res.,** 45, 2,177-187, Feb. 2011.
18. P.S. Palkar, M. G. Borland, S. Naruhn, C. H. Ferry, C. Lee, **U. H. Sk**, A. K. Sharma, S. Amin, I. A. Murray, C. R. Anderson, G. H. Perdew, F. J. Gonzalez, R. Muller, J. M. Peters, PPARβ/δ-dependent and independent functions of the PPARβ/ δ agonist GSK3787. **Mol Phermacol.**, 78, 419-430, 2010.
19. K. Sharma, **U. H. Sk**, P. He, J. Peters, S. Amin, Synthesis of isosteric selenium analog of the PPARβ/ δ- agonist GW501516 and comparison of biological activity, **Bioorg Med Chem Lett.,** 20, 14, 4050-4052, July 2010.
20. K. Sharma, **U. H. Sk**, M. A. Gimbor, J. A. Hengst, X. Wang, J. Yun, S. Amin, Synthesis and bioactivity of sphingosine kinase inhibitors and their novel aspirinyl conjugated, **EurJ Med Chem.,** 45, 9, 4149-4156, Sept., 2010.
21. **U. H. Sk**, A. K Sharma, S. Ghosh, S. Bhattacharya, Prevention of cadmium induced oxidative and hepatic damage in mice by a series of spiro [6-methoxytetralin-1, 3'-pyrrolidine] based organo selenocyanates: Effect of chain length, **Eur J Med Chem.,** 45, 8, 3265-3273, August 2010.
22. P. Chackraborty, **U. H. Sk**, N. Murmu, J.K. Das, S. Pal, S. Bhattacharya, Modulation of Cyclophosphamide Induced Cellular Toxicity by Diphenylmethyl Selenocyanate In Vivo, an Enzymatic Study. **J Cancer Mol.**, 4, 6, 183-189, 2009
23. P. Charaborty, **U. H. Sk**, S. Bhattacharya, Chemoprotection and enhancement of cancer chemotherapeutic efficacy of cyclophosphamide in mice bearing Ehrlich ascites carcinoma by diphenylmethyl selenocyanate. **Cancer Chemother Pharmacol.** 64, 5, 971-980, Oct. 2009.
24. Sarkar, P. Banerjee, **U. H. Sk.**, S. Bhattacharya, S. C Bhattacharya, Role of hydrogen bonding on the spectroscopic properties of thiazolidinedione derivatives in homogeneous solvents. **Spectrochim Acta A Mol Biomol Spectrosc.,** 72, 5, 1097-1102, June 2009.
25. R. Tewari, V. Sharma, N. Koul, A. Ghosh, C. Joseph, **U. H. Sk**, E. Sen., Ebselen abrogates TNFα induced pro-inflammatory response in glioblastoma. **Mol Oncol.,** 3, 1, 77-83, Feb. 2009.
26. V. Sharma, R. Tewari, **U. H. Sk**, C. Joseph , E. Sen, Organoselenium Ebselen sensitizes glioblastoma cells to Tumor Necrosis factor (TNFα) induced apoptosis through two distinct pathways involving NF-κB downregulation and Fas-mediated formation of death inducing signaling complex, **Int J Cancer**., 123, 9, 2204-2212, Nov. 2008.
27. **U. H. Sk.,**S. Bhattacharya, Synthesis of O-prenylated and O-geranylated derivatives of 5-benzylidene2,4-thiazolidinediones and evaluation of their free radical scavenging activity as well as effect on some phase II antioxidant/detoxifying enzymes, **Bioorg Med Chem Lett.,** 17, 5, 1149-1154, March, 2007.
28. R. K. Das, **U. H. Sk.,**S. Bhattacharya, Protective Effect of Diphenylmethyl selenocyanate against CCl4-induced hepatic injury, **J Appl Toxicol.,** 27, 6, 527-537, Nov. 2007.
29. P. Banerjee, S. Chatterjee, S. Pramanik, **U. H. Sk.,**S. Bhattacharya, S. C, Bhattacharya, Spectroscopic studies of 2-(2-bromo-ethyl)-6-nitro-benzo[de]isoquinolene -1,3-dione in water/alkanol mixed solvents and nonionic micelle of Igepal CO series, **Spectrochim Acta A Mol Biomol Spectrosc.,** 66, 4-5, 1110-1114, April, 2007.
30. S. Chatterjee, S. Pramanik, **U. H. Sk.,**S. Bhattacharya, S. C. Bhattacharya, Synthesis and Photoinduced intramolecular charge transfer of N-substituted1,8-Naphthalimide derivatives in homogeneous solvents and in presence of reduced glutathione. **J Photochem Photobiol A Chem.,** 187, 1,64-71, March, 2007.

31. **U. H. Sk**, S. Bhattacharya, Prevention of cadmium induced lipid peroxidation, depletion of some antioxidative enzymes and glutathione by a series of novel organoselenocyanates, **EnvironToxicol Pharmacol.,** 22, 3, 298-308, Nov., 2006.
32. **U. H. Sk.,**S. Sengupta, S. Bhattacharya, Synthesis and evaluation of antioxidative properties of a series of organoselenium compounds, **Bioorg Med Chem.,** 13, 20, 5750-5758, Oct., 2005.
33. R. K. Das**, U. H. Sk,**S. Bhattacharya, Diphenylmethyl selenocyanate inhibits DMBAcroton oil induced two-stage mouse skin carcinogenesis by inducing apoptosis and inhibiting cutaneous cell proliferation **Cancer Lett.,** 230, 1, 90-101, Dec. 2005.
34. S. K. Ghosh, **U. H. Sk.,**S. Bhattacharya, S. C. Bhattacharya, 2-(2-Selenocyanic acid ethyl ester)-1H-benz[de] isoquinoline-1,3-(2H)-dione, synthesis photophysics and interaction with bovine serum albumin: A spectroscopic approach **J Photochem Photobiol B: Biol.**, 81, 2, 121-128, Nov. 2005.

PROFESSIONAL MEMBERSHIP

1. Life member of Indian Association for the Cultivation of Science, Kolkata, India
2. American Association for Cancer Research, USA
3. American Chemical Society, USA

REFERENCES

1. Dr. Ellora Sen, Associate Professor, Division of Molecular and Cellular Neurosciences, National Brain Research Centre, Manesar, Haryana 122050, India. e-mail: ellora@nbrc.ac.in , +91 124 233 8922-23 (Ext : 235).
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