Curriculum Vitae

Personal Details

Name: Sourav Kalita

Date of Birth: 08th May, 1991

Nationality: Indian

Religion: Hinduism

Marital Status: Married

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Present Address:

Department of Chemistry, North Gauhati College, North Guwahati, Kamrup, Assam, India
PIN: 781031

Permanent Address:

Vill: Pub Par Jatiya Bhangara, P.O.: Bardangeri Kuchi, Dist: Kamrup (R), Assam, India. PIN: 781366.

Qualifications

07/2014-01/2022

Ph.D. in Chemistry (CPI 8.25 out of 10)

Indian Institute of Technology Guwahati, Guwahati, Assam, India

Thesis title: Effect of Anthranilic Acid Insertion in β-sheet Breaker Hybrid Peptidomimetics on hIAPP Aggregation

Thesis advisor: Prof. Bhubaneswar Mandal

07/2012-06/2014

M.Sc. in Chemistry (CGPA 8.97 out of 10)

Gauhati University, Guwahati, Assam, India

Thesis title: Characterization and Catalytic Reactivity of Parent and Isomorphously Iron Substituted Mordenite Zeolite

Thesis advisor: Prof. Anup Kumar Talukdar

07/2009-06/2012

B.Sc. in Chemistry Honours (79.6%, First Class with Distinction) with Physics, Mathematics and English

B. Borooah College, Gauhati University, Guwahati, Assam, India

07/2007-05/2009

Higher Secondary (H.S.) (68.8%, First Division) with Physics, Chemistry, Mathematics, Biology, English and Assamese

Jigyas Academy, Guwahati, Assam, India

05/2007

Matriculation (HSLC) (78.16%, First Division, Star) with Social Science, General Science, General Maths, Advanced Maths, General English and Assamese

Adarsha Jatiya Vidyalaya, Bihdia, Kamrup (R), Assam, India

Honours / Awards

- Received Best Poster Presentation Award, *Chem Convene*, 2017, IIT Guwahati, Guwahati, 25th July, 2017.
- Received Graduate Aptitude Test in Engineering (GATE) in 2019 (rank 510) and in 2014 (rank 838) in Chemistry.
- Received State Level Eligibility Test (SLET-NE) February-2014 in Chemical Science.

Research Experiences

- During my Ph.D. tenure, I have learned and gained experiences working on peptide synthesis including solution phase and solid phase peptide synthesis (SPPS), self-assembly of peptides, Alzheimer's disease and Type-II diabetes.
- I have expertise in various instrumental techniques including, HPLC, ESI-MS, Fluorescence, UV-Vis, CD, FTIR, TEM, DLS, Optical-polarizable microscope, *etc*.
- During my PhD tenure, I mainly focused on the design and synthesis of different peptide based molecules as inhibitors against Alzheimer's disease (AD) and type-2 Diabetes (T2D). I have developed three different peptide-based strategies for the design of therapeutic tools against T2D, including small BSBHps, long BSBHps, and stapled peptides via inserting anthranilic acid (Ant). All the designed peptidomimetics exhibited excellent anti-Diabetic activities, which were verified *in vitro* at physiological conditions using various biophysical tools like Thioflavin T fluorescence assay, TEM and Congo-red stained birefringence analyses.
- I have worked on the mechanism of amyloid inhibition by the designed peptidomimetics using dynamic light scattering technique, TEM analysis and LUV dye leakage assay.

- I also have worked on synthetic organic reactions such as Fmoc-protections, Boc-protections, fluorophore attachments, esterification reactions and solution phase synthesis of novel and recyclable coupling reagent, Ethyl 2-cyano-2-(2-nitrobenzenesulfonyloxyimino) acetate (o-NosylOXY) and its utilization in peptide synthesis.

Academic and Professional Skills

- **Laboratory and Instrumentation:** Familiar with Synthetic Organic Chemistry, peptide synthesis (solution phase and solid phase) and purification, Mass spectrometry (ESI), MALDI-TOF, HPLC, Fluorescence spectroscopy, UV-Visible spectroscopy, Circular Dichroism, Infrared spectroscopy, ESR spectroscopy, Optical Polarisable Microscopy, TEM, FESEM.
- **Software:** Familiar with Origin, Adobe Illustrator, MS-office, Chemdraw.
- **Teaching Experience:** Worked as Teaching Assistant (TA) in B.Tech and M.Sc Laboratory at IIT Guwahati, India.
- **Language:** English, Assamese, Bengali and Hindi.

Work experience

- **ONGC:** Joined as Junior Scientific Assistant (Chemistry) in ONGC Assam Asset, Sivasagar, in May, 2016 and resigned as Scientific Assistant (Chemistry) in May, 2023.
- **North Gauhati College:** Joined as an Assistant Professor in North Gauhati College, College Nagar, North Guwahati in June, 2023.

Research Interests

- Protein and peptide chemistry
- Protein/peptide self-assembly
- Type II Diabetes and other protein aggregating diseases.

Publications:

1. Alom, S. E., Kalita, S., Kawa, A. H., Mandal, B. and Swaminathan, R., **(2024)** Early events during the aggregation of $A\beta_{16–22}$ derived switch-peptides tracked using protein charge transfer spectra. *Analytica Chimica Acta*, 1297, 342374.
2. Kalita, S., **Kalita, S**., Kawa, A. H., Shill, S., Gupta, A., Kumar, S. and Mandal, B. (**2022**) Copper Chelating Cyclic Peptidomimetic Inhibits Aβ Fibrillogenesis. *RSC Med. Chem.*, 13, 761-774.
3. **Kalita, S**., Kalita, S., Paul, A., Shah, M., Kumar, S. and Mandal, B., **(2021)** Site-specific single point mutation by anthranilic acid in $hIAPP_{8-37}$ enhances anti-amyloidogenic activity. *RSC Chem. Biol*., 2, 266-273.
4. Paul, A., Kumar, S., Kalita, S., **Kalita, S**., Sarkar, D., Bhunia, A., Bandyopadhyay, A., Mondal, A. C. and Mandal, B. **(2021)** An explicitly designed paratope of amyloid-β prevents neuronal apoptosis *in vitro* and hippocampal damage in rat brain. *Chem. Sci*., 12, 2853-2862.
5. Kalita, S., **Kalita, S**., Paul, A., Sarkar, A. and Mandal, B.; **(2020)** Peptidomimetics prepared by tail to side chain one component peptide stapling inhibit Alzheimer's amyloid-β fibrillogenesis. *Chem. Sci*., 11, 4171-4179.
6. Ratha, B. N., Kar, R. K., Kalita, S., **Kalita, S**., Raha, S., Singha, A., Garai, K., Mandal, B. and Bhunia, A.; **(2019)** Sequence specificity of amylin-insulin interaction: a fragment-based insulin fibrillation inhibition study. *BBA-Proteins and Proteomics*, 1867, 405-415.
7. Paul, A., Kumar, S., **Kalita, S**., Ghosh, A. K., Mondal, A. C. and Mandal, B.; **(2018)** A Peptide-Based Pro-drug Disrupts Alzheimer's Amyloid into Non-toxic species and reduces Aβ induced toxicity in vitro. *Int J Pept Res Ther,* 24 (1), 201-211.
8. Kumar, S., Paul, A., **Kalita, S**., Kumar, A., Hazra, S., Ghosh, A. K., Mandal, B. and Mondal, A. C.; **(2017)** A peptide-based pro-drug ameliorates Amyloid-β induced neuronal apoptosis in vitro SH-SY5Y cells. *Current Alzheimer Research*. 14 (12) 1293.
9. Kumar, S., Paul, A., **Kalita, S**., Ghosh, A. K., Mandal, B. and Mondal, A.C.; **(2017)** Protective effects of β-sheet breaker α/β-hybrid peptide against amyloid β-induced neuronal apoptosis in vitro. *Chem Biol Drug Des*; 89 (6), 888-900.
10. Paul, A., **Kalita, S**., Kalita, S., Sukumar, P. and Mandal, B.; **(2017)** Disaggregation of Amylin Aggregate by Novel Conformationally Restricted Aminobenzoic Acid containing α/β and α/γ Hybrid Peptidomimetics. *Sci. Rep., 7,* 40095.
11. Sharma, B., **Kalita, S**., Paul, A., Mandal, B. and Paul, S.; **(2016)** The role of caffeine as an inhibitor in the aggregation of amyloid-forming peptides: a unified molecular dynamics simulation and experimental study. *RSC Adv*., 6, 78548.
12. Saha, A., Nadimpally, K.C., Paul, A., **Kalita, S**. and Mandal, B.; **(2014)** Phenolic Ester mediated oligopeptide synthesis promoted by HOBt. *Protein and Peptide Letters*, 21 (2) 188.

Conference and Workshop Attended:

1. **Kalita, S**. and Mandal, B.; (2024) Restriction of amylin aggregation using side chain-to-tail stapled peptides: A therapeutic study to prevent type II diabetes. *ICETB 2024*, 11th-13th March, 2024, Nalbari College, Nalbari, Assam, OP32 (Oral Presentation).
2. **Kalita, S**., Kalita, S. and Mandal, B.; (2020) Effective modulation against amyloid aggregation of hIAPP using modified stapled peptides. *SSD 2020*, 25th-26th September, 2020, B. Borooah College, Assam, India, PP16. (Poster presentation)
3. **Kalita, S**., Kalita, S., Paul, A. and Mandal, B.; (2019) Inhibition of amylin aggregation by single point mutant of hIAPP at different positions. *IPS 2019* 28th February–1st March, 2019, BITS Pilani, Hyderabad Campus, India, P41. (Poster presentation).
4. **Kalita, S**., Kalita, S., Paul, A. and Mandal, B.; (2019) Inhibition of toxic diabetic's amyloid aggregation by conformationally restricted hybrid Peptidomimetics. *SSD 2019*, 9th January, 2019, B. Borooah College, Assam, India, OP40, page 55. (Oral presentation)
5. Kalita, S., Paul, A., **Kalita, S**., and Mandal, B.; (2017) Disaggregation of amylin aggregation by novel conformationally restricted aminobenzoic acid containing α/β and α/γ hybrid Peptidomimetics. *ICSIMR 2017*, 30th June-1st July, 2017, IIT Guwahati, India, PP61, page 122. (Participation).
6. **Kalita, S**., Paul, A., Kalita, S. and Mandal, B.; (2017) A novel strategy for drug design against Diabetes Type II (T2D) by disaggregation of amylin aggregation by conformationally restricted hybrid Peptidomimetics. *Chem Convene 2017*, 25th July, 2017, IIT Guwahati, India, P40, page 84. (Poster presentation, recipient of best poster presentation award).
7. **Kalita, S**., Paul, A., Kalita, S. and Mandal, B.; (2016) Anti-diabetic activity of aminobenzoic acid containing α/β and α/γ but not α/δ hybrid peptide. *FICS 2016*, 8th -10th December 2016, IIT Guwahati, India, OP13, page 50. (Oral presentation)
8. National Workshop on Advanced Probing Techniques in TEM (APTTEM-2016) at IIT Guwahati, Assam, India, 15th-16th February, 2016.

Book Chapter

1. Sourav Kalita, (2020) Diabetes: A striking correlation with amylin and strategic development against the disease. *Aspects of sustainable chemical sciences*, First edition, September-2020,

Page no: 102-118, Publisher: Purbayon Publication, Panbazar, Guwahati, Assam, India. Editors: Dr. Sanjeev Pran Mahanta and Dr. Dipjyoti Kalita, ISBN: 978-93-89940-82-4.

2. Sourav Kalita, Sujan Kalita, Pankaj Kumar Kalita, (2024) Barriers and Drivers: Development of Science and Technology in North East India. Development of North East India: Issues and Prospects, First edition, January 2024, Page no: 29-62, Publisher: Assam College Teachers' Association, Editors: Bedabrat Saikia, Romen Kalita and Jamanur Rahman, ISBN: 978-93-93864-29-1