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Appendix

Figure A1: ^{1}H NMR spectra of (Z)-3-(3-(3-fluorophenyl)ureido)-N'-hydroxybenzimidamide (3q)

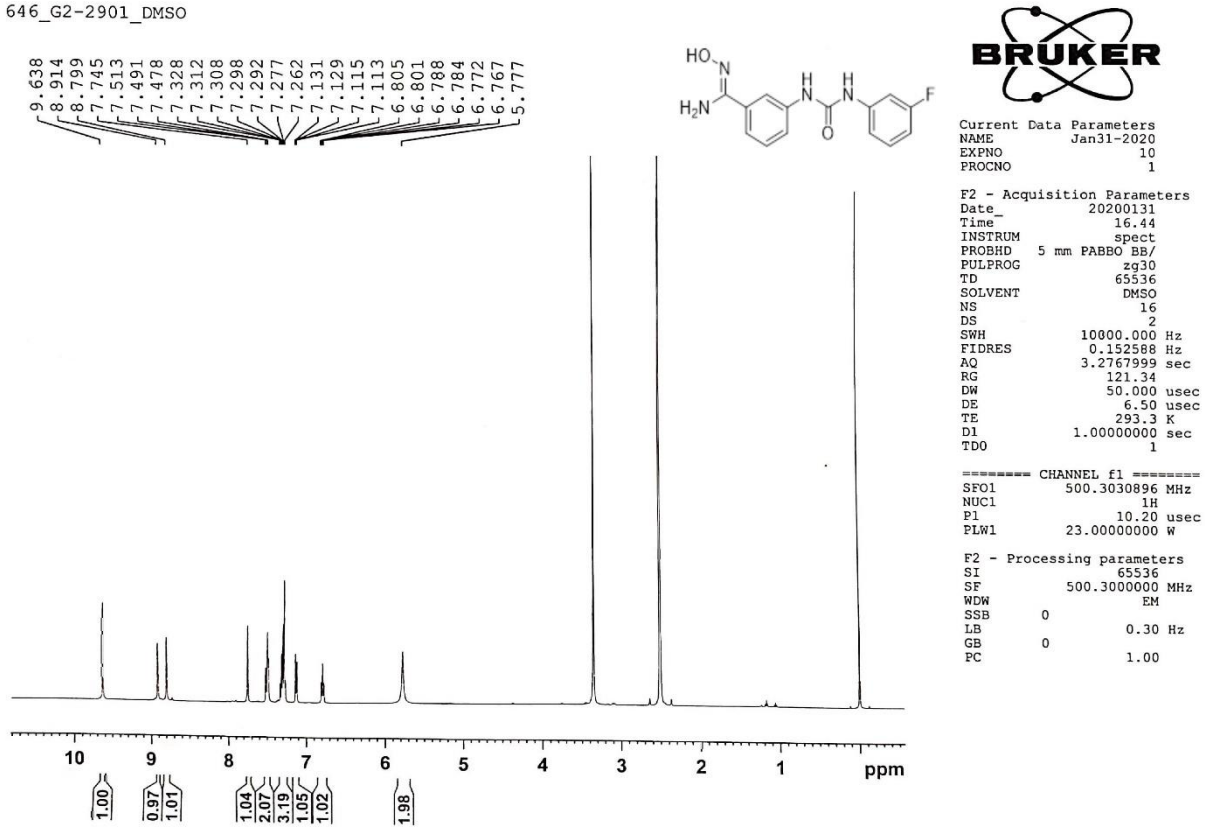


Figure A2: ^{13}C NMR spectra of (Z)-3-(3-(3-fluorophenyl)ureido)-N'-hydroxybenzimidamide (3q)

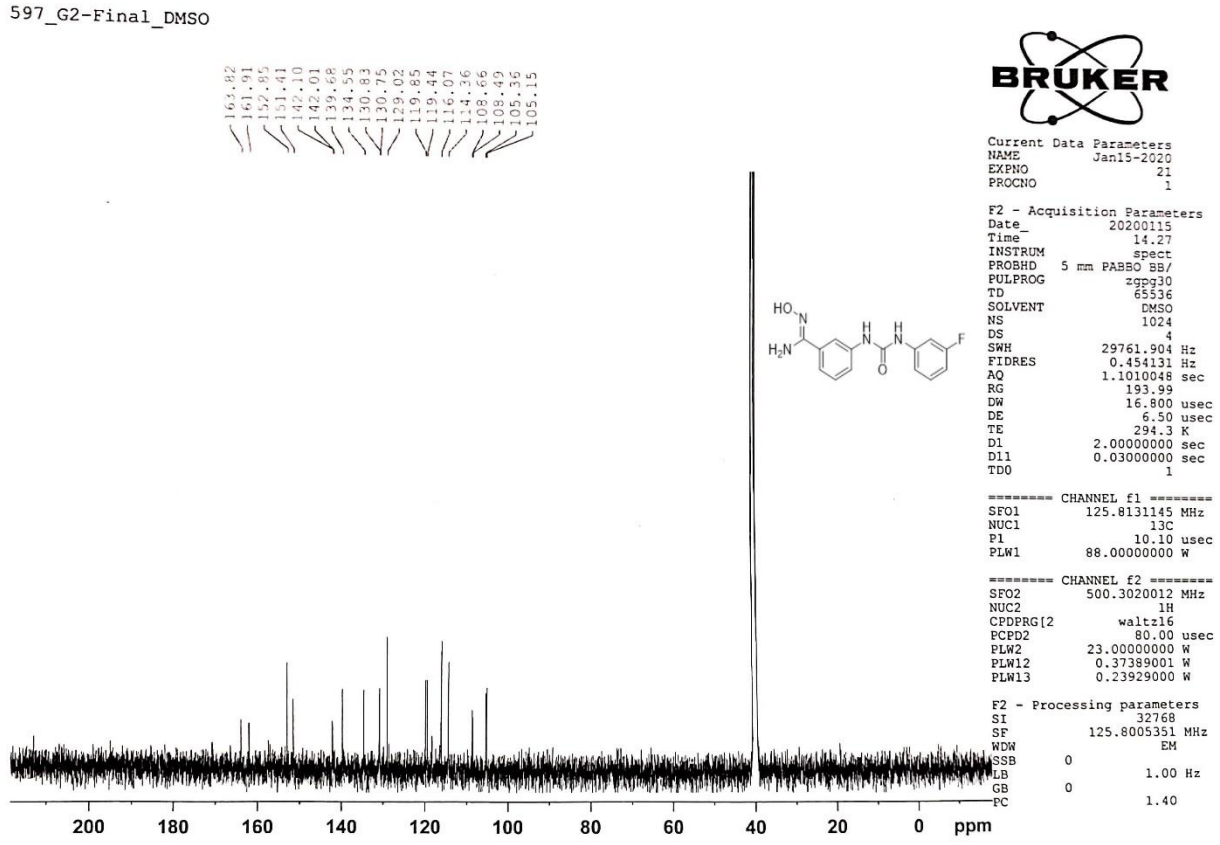


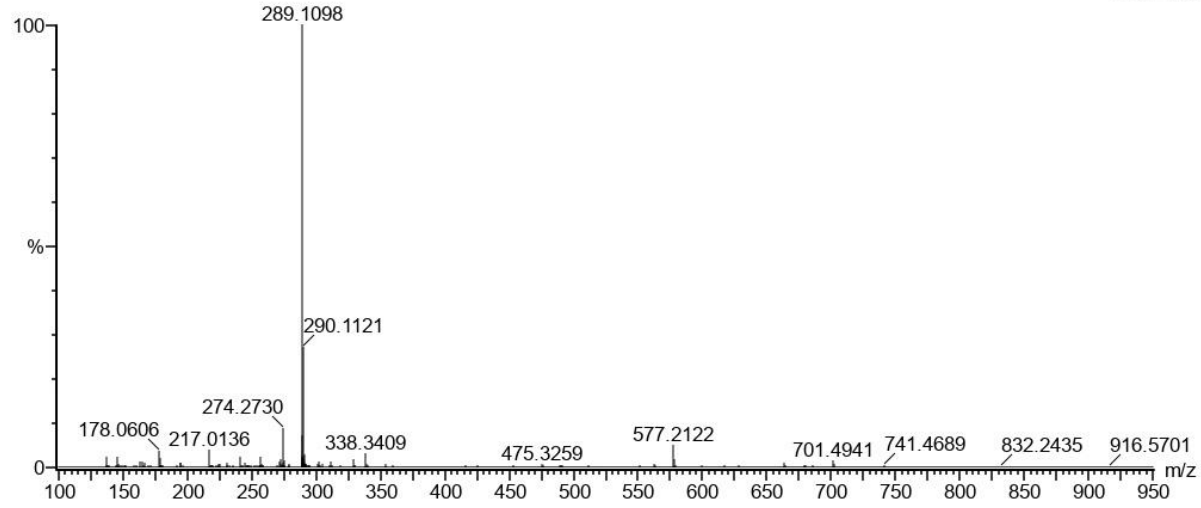
Figure A3: HRMS spectra of (Z)-3-(3-(3-fluorophenyl)ureido)-N'-hydroxybenzimidamide (3q)

Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 2.0 PPM / DBE: min = -1.5, max = 50.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 5

Monoisotopic Mass, Even Electron Ions
78 formula(e) evaluated with 1 results within limits (up to 50 best isotopic matches for each mass)
Elements Used:
C: 10-18 H: 12-25 N: 0-4 O: 0-3 F: 0-3

Sample Name : G-2 IITRPR XEVO G2-XS QTOF
Test Name : HRMS-1
050220-G-2 18 (0.183) 1: TOF MS ES+
5.82e+007



Minimum:				-1.5				
Maximum:		5.0	2.0	50.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Norm	Conf(%)	Formula
289.1098	289.1101	-0.3	-1.0	9.5	2021.4	n/a	n/a	C14 H14 N4 O2 F

Figure A4: ^{1}H NMR spectra of (Z)-N'-hydroxy-3-(3-(2-(5-methoxy-1H-indol-3-yl)ethyl)ureido)benzimidamide (6e)

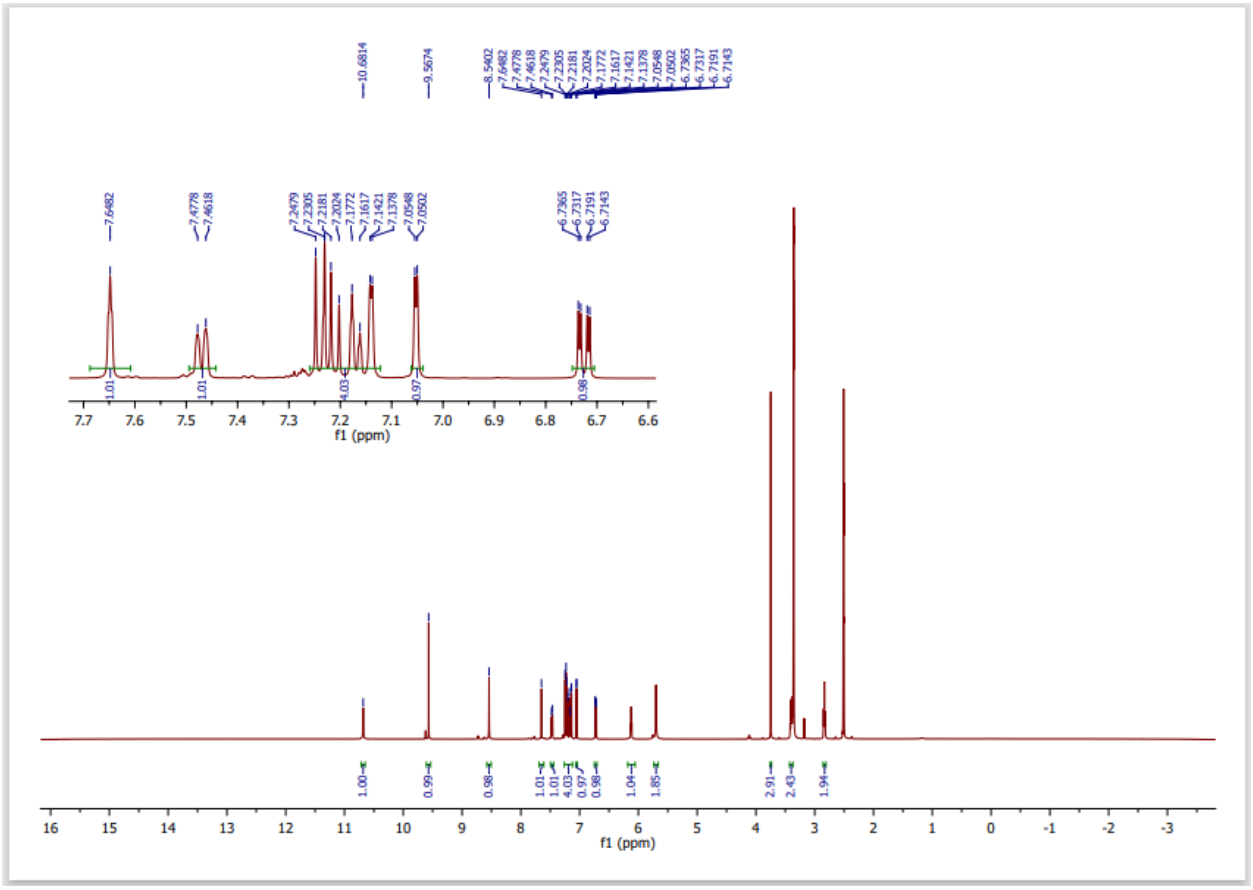


Figure A5: ^{13}C NMR spectra of (Z)-N'-hydroxy-3-(3-(2-(5-methoxy-1H-indol-3-yl)ethyl)ureido)benzimidamide (6e)

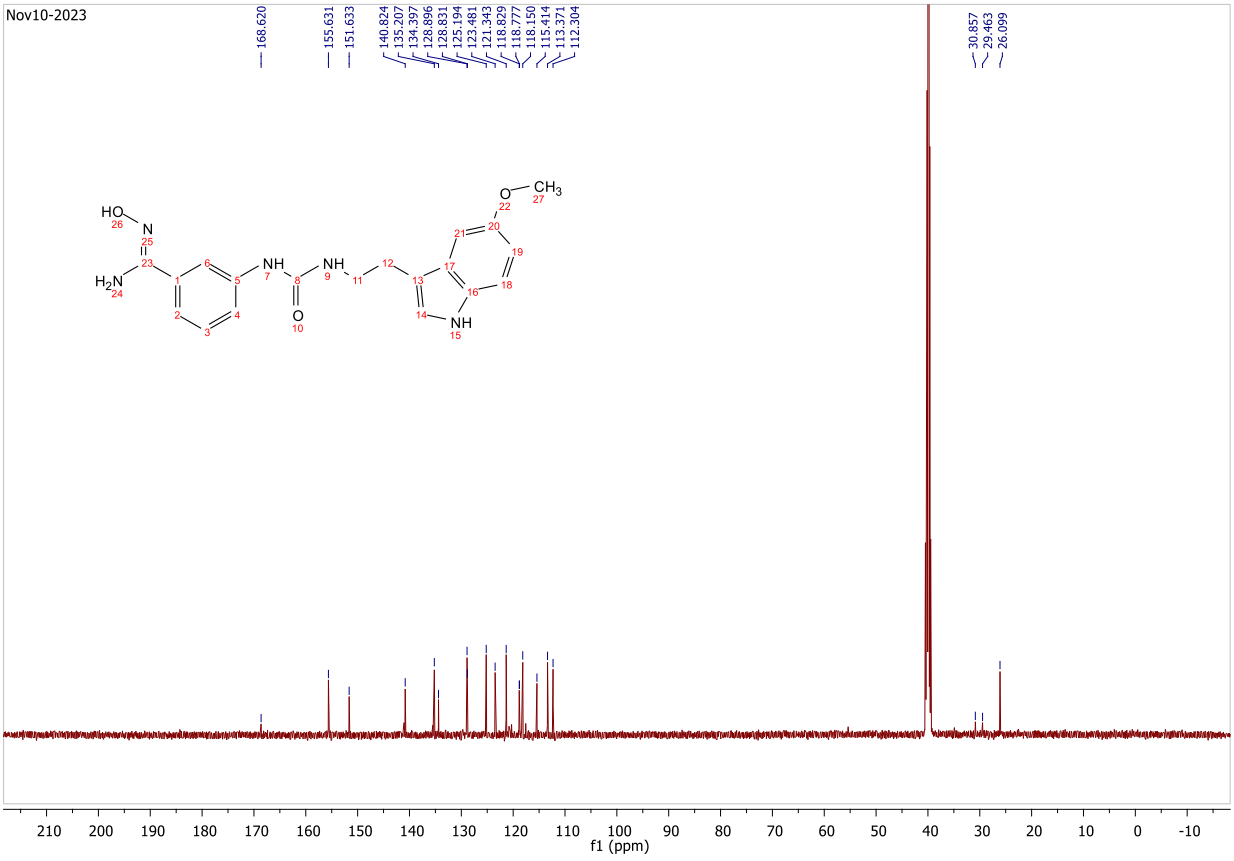


Figure A6: HRMS spectra of (Z)-N'-hydroxy-3-(3-(2-(5-methoxy-1H-indol-3-yl)ethyl)ureido)benzimidamide (6e)

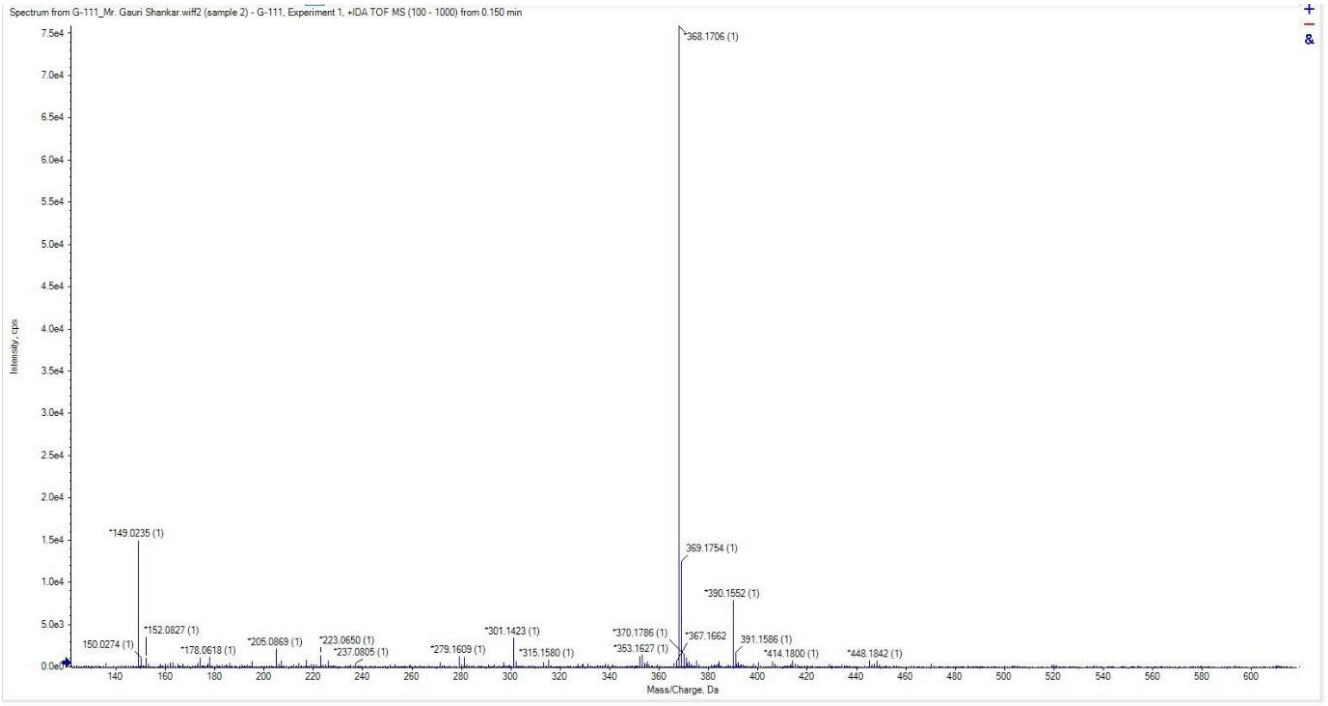


Figure A7: ^{1}H spectra of (S)-3-(1-(dimethylamino)ethyl)phenyl (2-(5-hydroxy-1H-indol-3-yl)ethyl)carbamate (15d)

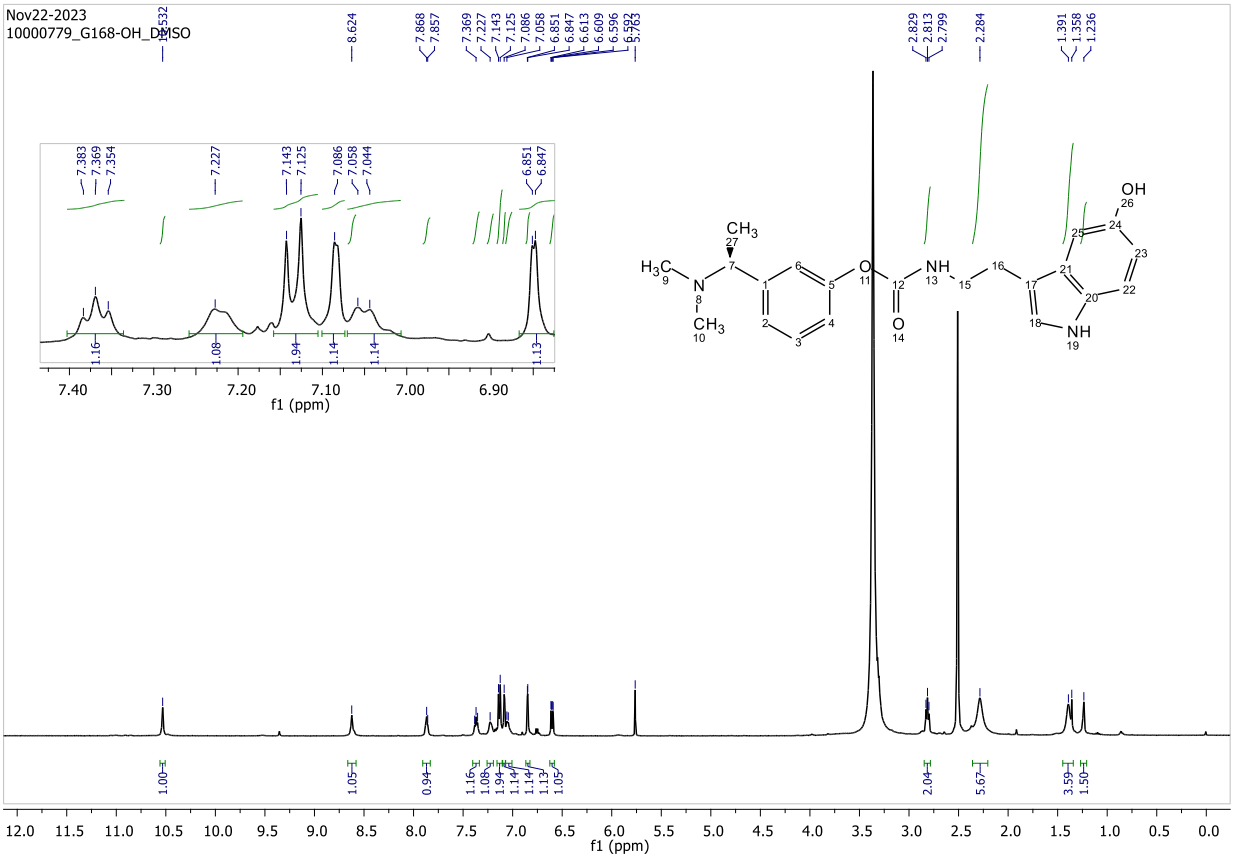


Figure A8: ^{13}C spectra of (S)-3-(1-(dimethylamino)ethyl)phenyl (2-(5-hydroxy-1H-indol-3-yl)ethyl)carbamate (15d)

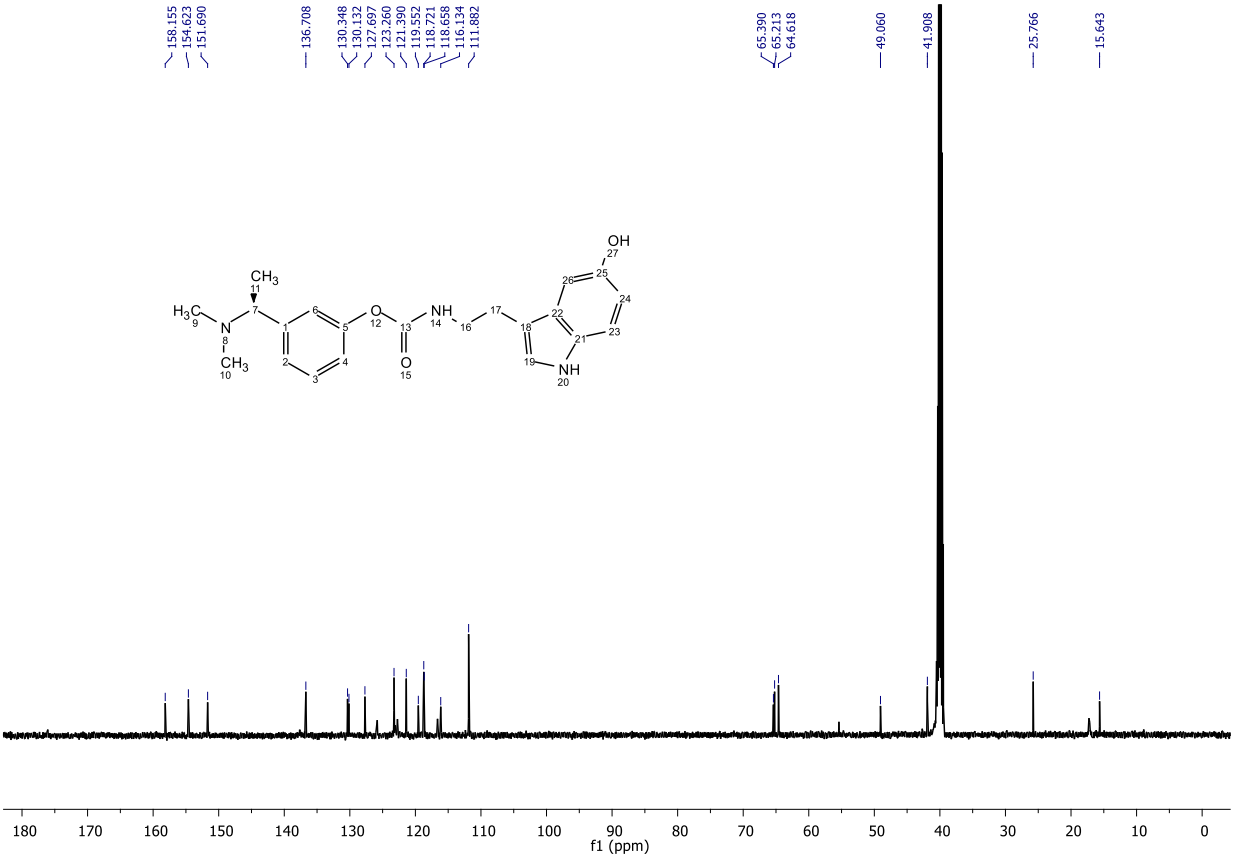


Figure A9: HRMS spectra of (S)-3-(1-(dimethylamino)ethyl)phenyl (2-(5-hydroxy-1H-indol-3-yl)ethyl)carbamate (15d)

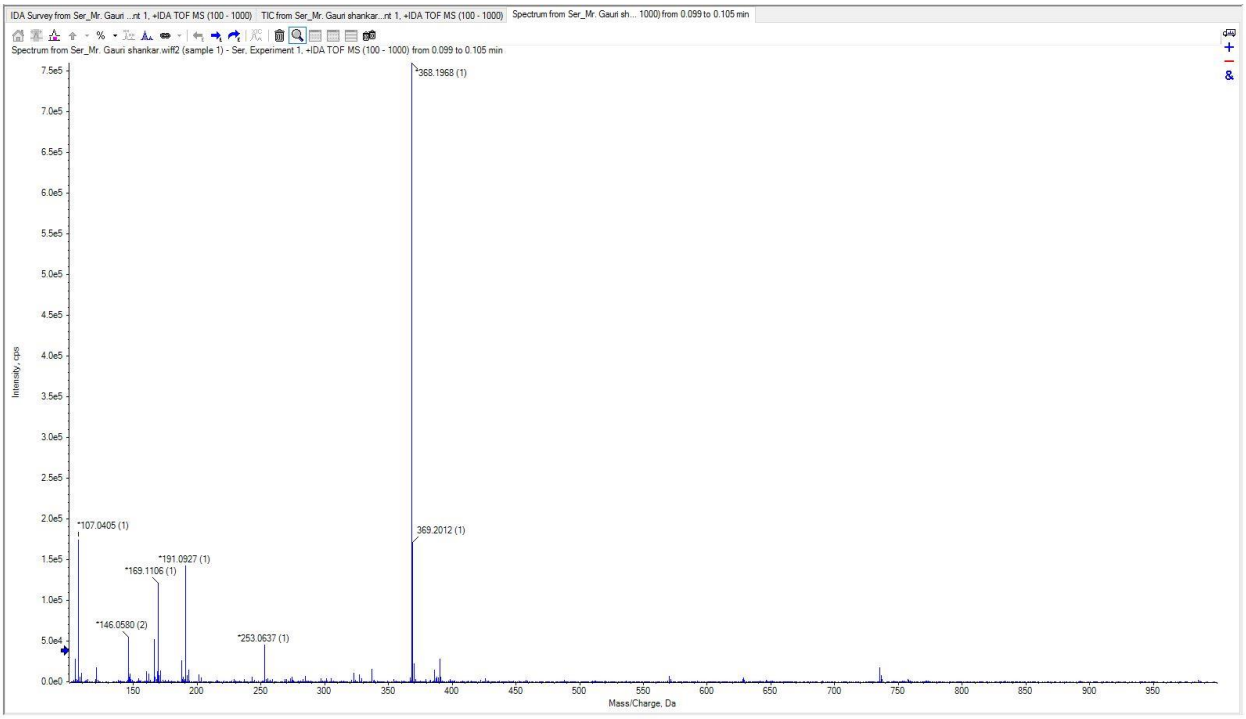


Figure A10: HPLC chromatogram of (S)-3-(1-(dimethylamino)ethyl)phenyl (2-(5-hydroxy-1H-indol-3-yl)ethyl)carbamate (15d)

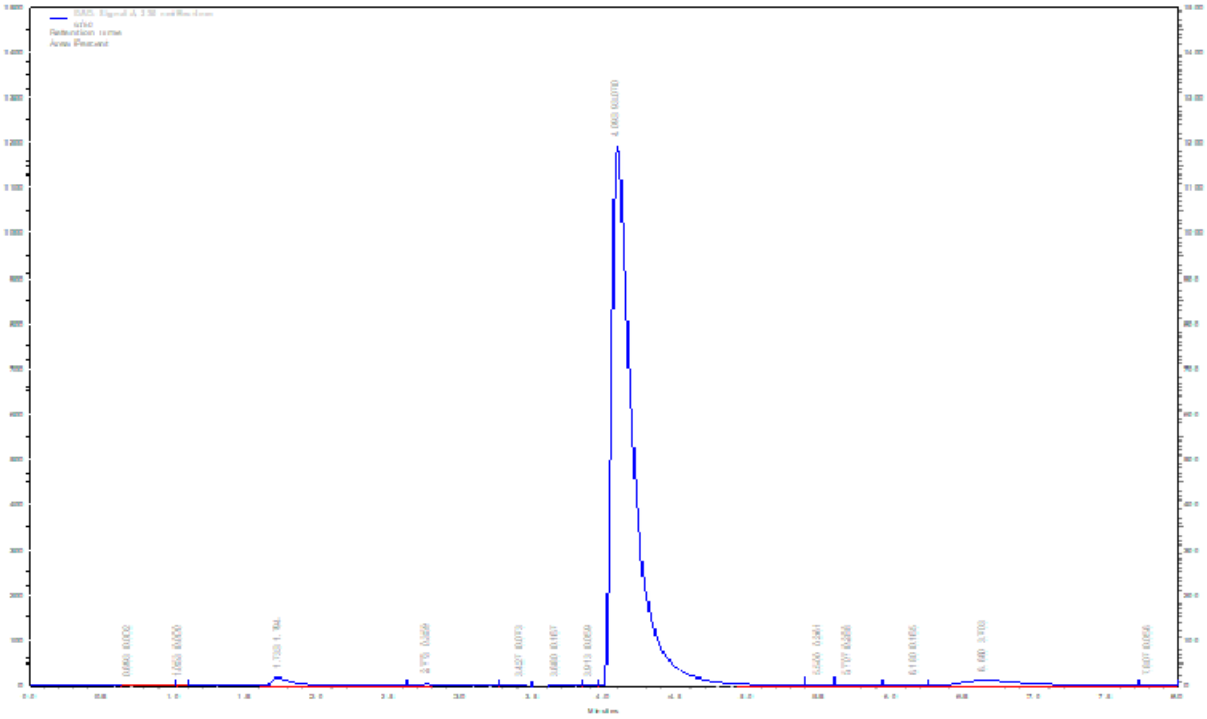


Figure A11: ^{1}H spectra of (S)-3-(1-(dimethylamino)ethyl)phenyl (2-(5-chloro-1H-indol-3-yl)ethyl)carbamate (15e)

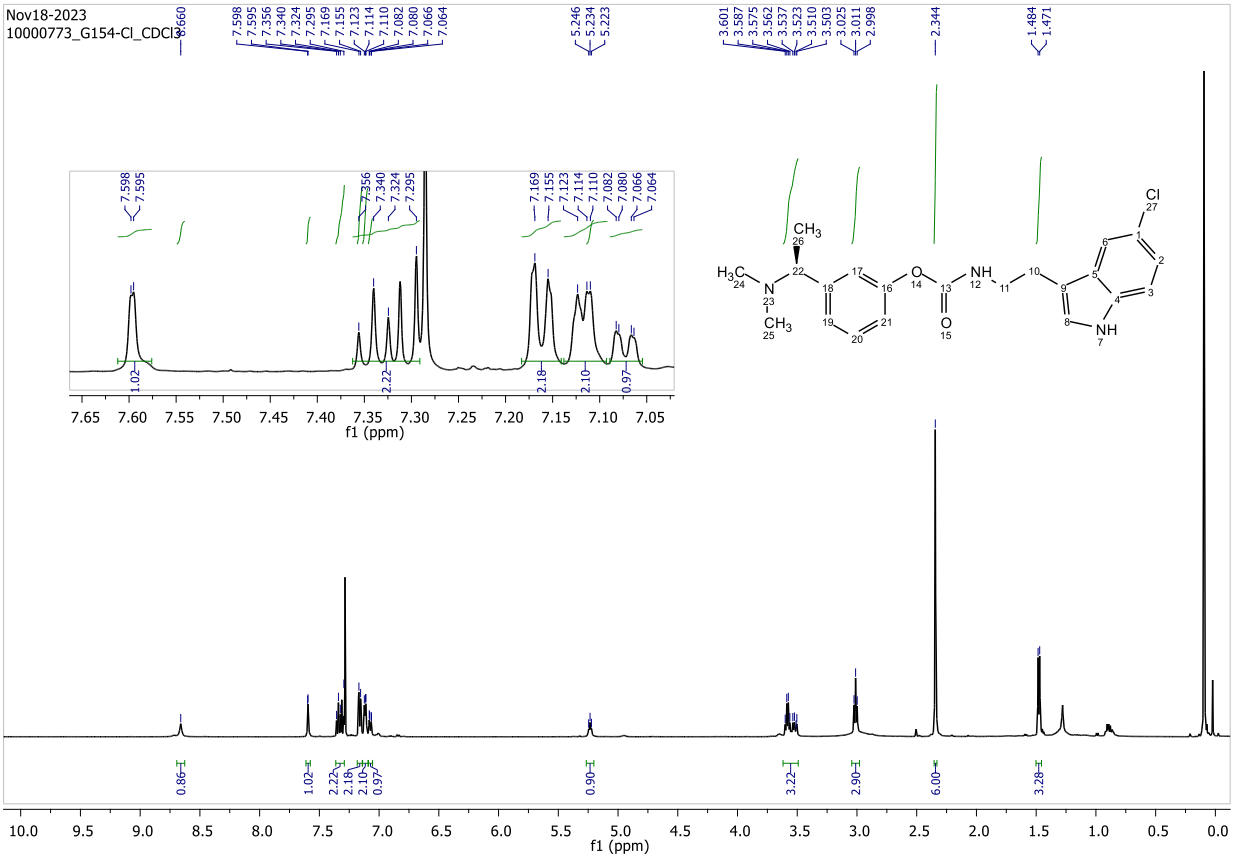


Figure A12: ^{13}C spectra of (S)-3-(1-(dimethylamino)ethyl)phenyl (2-(5-chloro-1H-indol-3-yl)ethyl)carbamate (15e)

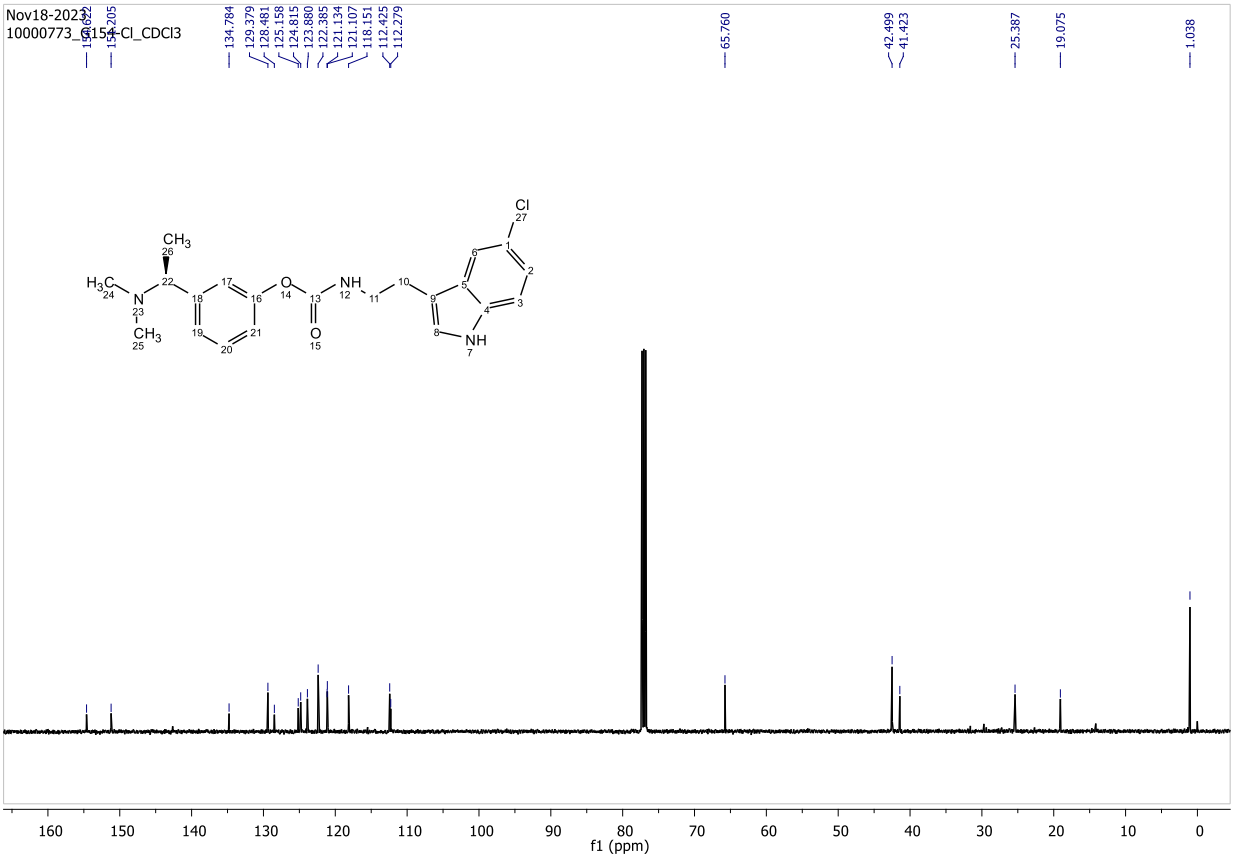


Figure A13: HRMS spectra of (S)-3-(1-(dimethylamino)ethyl)phenyl (2-(5-chloro-1H-indol-3-yl)ethyl)carbamate (15e)

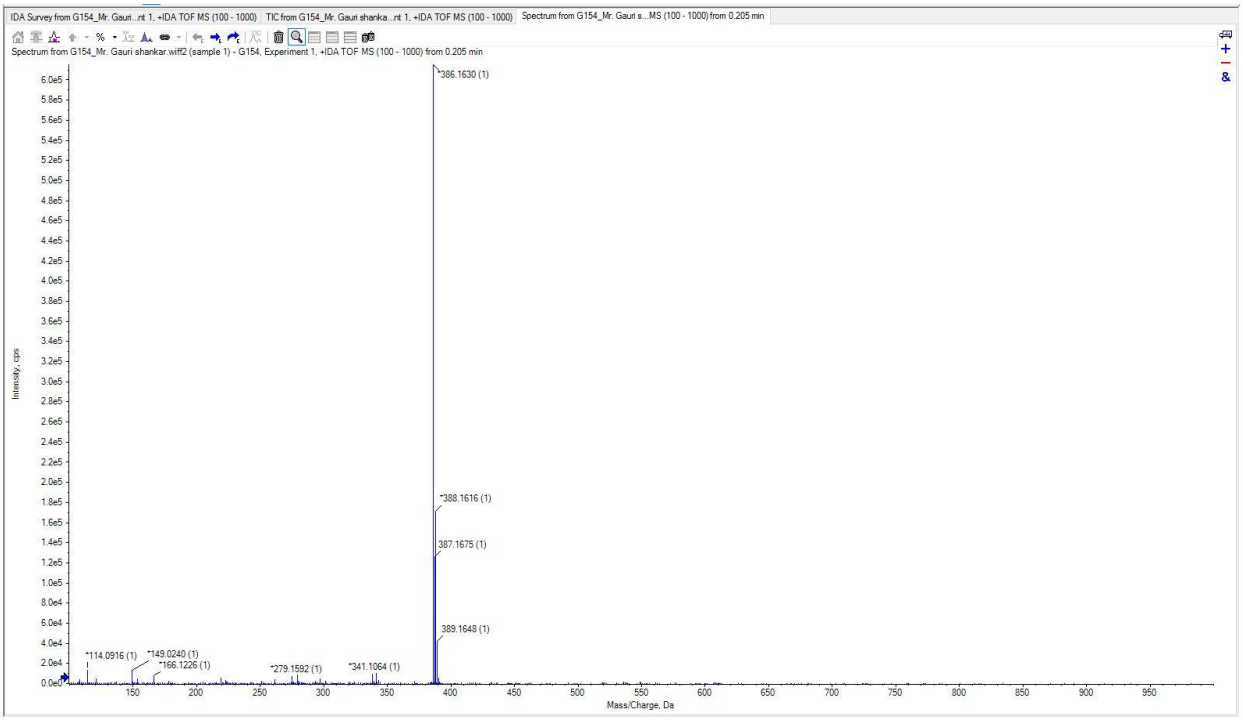
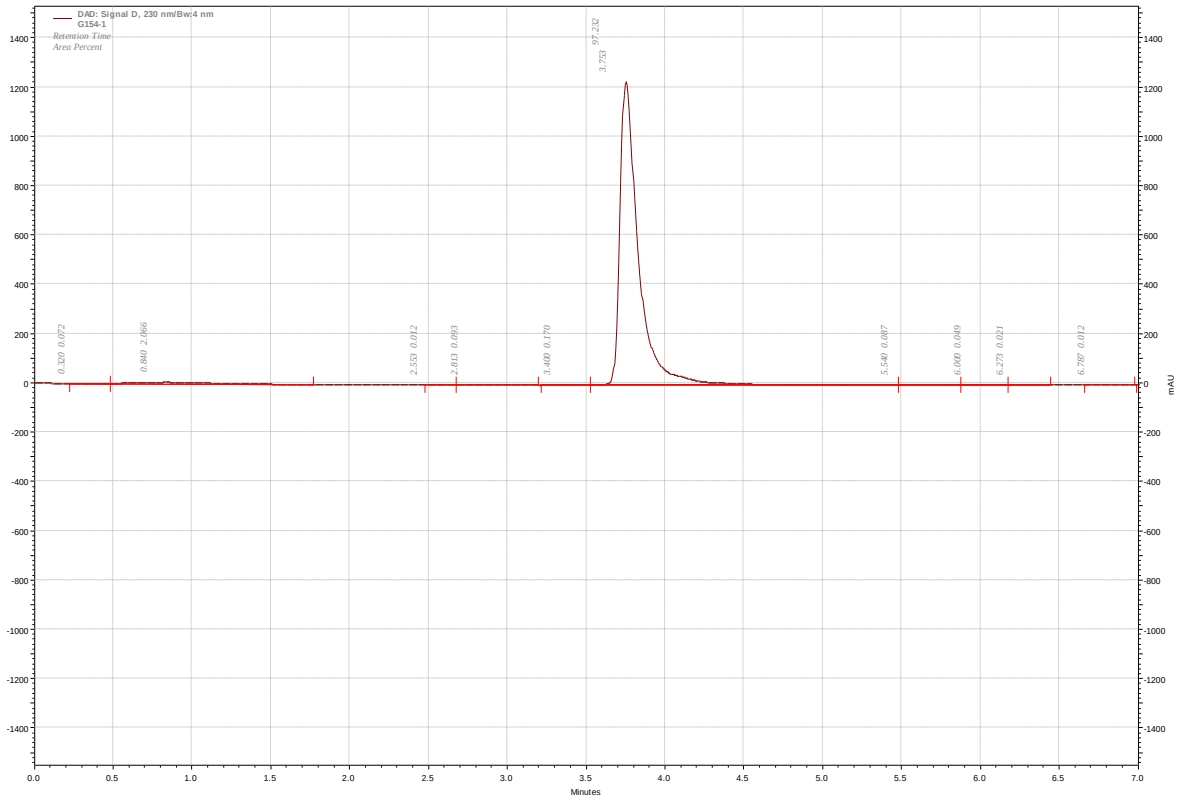


Figure A14: HPLC chromatogram of (S)-3-(1-(dimethylamino)ethyl)phenyl (2-(5-hydroxy-1H-indol-3-yl)ethyl)carbamate (15e)



List of Publications

1. Shankar G, Kumar P, Rai S, Ghosh A, Varma T, Wani MA, Kumar S, Mandloi U, Singh GK, Garg P, Kulkarni O, Srikrishna S, Kumar S, Modi G. Discovery of novel hybrid tryptamine-RIV molecules as potent AChE and BChE inhibitors exhibiting multifunctional properties for the management of Alzheimer's disease. Eur J Med Chem. 2024 Nov 27; 283: 117066. doi: 10.1016/j.ejmech.2024.117066.

2. **Shankar G,** Praveen Kumar C, Yadav M, Ghosh A, Panda SR, Banerjee A, Tiwari A, Rai S, Kumar S, Garg P, Naidu VGM, Kulkarni O, Modi G. Discovery of novel substituted (Z)-N'-hydroxy-3-(3-phenylureido)benzimidamide derivatives as multifunctional molecules targeting pathological hallmarks of Alzheimer's disease. Eur J Med Chem. 2024 Dec 15; 280:116959. doi: 10.1016/j.ejmech.2024.116959.

3. Kumar, J., **Shankar, G,** Kumar, S. *et al.* Design, synthesis and biological evaluation of novel piperic acid and benzylpiperazine hybrid molecules for improvement of memory impairment via cholinesterase inhibitory activity. *Chem. Pap.* (2024). https://doi.org/10.1007/s11696-024-03787-7.

4. Kumar J, **Shankar G**, Kumar S, Thomas J, Singh N, Srikrishna S, Satija J, Krishnamurthy S, Modi G, Mishra SK. Extraction, isolation, synthesis, and biological evaluation of novel piperic acid derivatives for the treatment of Alzheimer's disease. Mol Divers. 2024 Jun;28(3):1439-1458. doi: 10.1007/s11030-023-10667-x.

5. Singh G, **Shankar G,** Panda SR, Kumar S, Rai S, Verma H, Kumar P, Nayak PK, Naidu VGM, Srikrishna S, Kumar S, Modi G. Design, Synthesis, and Biological Evaluation of Ferulic Acid Template-Based Novel Multifunctional Ligands Targeting NLRP3 Inflammasome for the Management of Alzheimer's Disease. **ACS Chem**

Neurosci. 2024 Apr 3;15(7):1388-1414**.** https://doi.org/10.1021/acschemneuro.3c00679.

6. Venkatesh R, **Shankar G,** Narayanan AC, Modi G, Sabiah S, Kandasamy J. Multicomponent Synthesis of S-Benzyl Dithiocarbamates from para-Quinone Methides and Their Biological Evaluation for the Treatment of Alzheimer's Disease. J Org Chem. 2022 May 20;87(10):6730-6741. doi: 10.1021/acs.joc.2c00423.

7. Singh YP, Kumar N, Priya K, Chauhan BS, **Shankar G**, Kumar S, Singh GK, Srikrishna S, Garg P, Singh G, Rai G, Modi G. Exploration of Neuroprotective Properties of a Naturally Inspired Multifunctional Molecule (F24) against Oxidative Stress and Amyloid β Induced Neurotoxicity in Alzheimer's Disease Models. **ACS Chem Neurosci.** 2022 Jan 5;13(1):27-42. https://doi.org/10.1021/acschemneuro.1c00443.

8. Singh YP, **Shankar G**, Jahan S, Singh G, Kumar N, Barik A, Upadhyay P, Singh L, Kamble K, Singh GK, Tiwari S, Garg P, Gupta S, Modi G. Further SAR studies on natural template based neuroprotective molecules for the treatment of Alzheimer's disease. **Bioorg Med Chem.** 2021 Sep 15;46:116385. doi: 10.1016/j.bmc.2021.116385.

9. Singh YP, Tej GNVC, Pandey A, Priya K, Pandey P, **Shankar G,** Nayak PK, Rai G, Chittiboyina AG, Doerksen RJ, Vishwakarma S, Modi G. Design, synthesis and biological evaluation of novel naturally-inspired multifunctional molecules for the management of Alzheimer's disease. Eur J Med Chem. 2020 Jul 15;198:112257. doi: 10.1016/j.ejmech.2020.112257.

Manuscript Under Revision

10. Himanshu Rai, Rishabh Singh, **Shankar G,** Sanskriti Rai, Prabhat Kumar, Aishwarya S. Nilakhe, Neha Singh, Poonam Bhadoria, Venkatnarayan Ramanathan, Gourav Singh, Sarika Gupta, Sairam Krishnamurthy, Saripella Srikrishna, Saroj Kumar, Gyan Modi. Discovery of novel NIRF theranostic probes targeting amyloid-β fibrils and cholinesterases in Alzheimer's disease models. **Nature Communication (Under revision).**

Manuscript Under Preparation

11. Evaluation of neuroprotection properties of (Z)-N-hydroxy-3-(3-phenylureido) benzimidamide (EJMC-3e and 6q) in oxidative stress and Amyloid in Alzheimer's disease models.

PATENT GRANTED

1. A natural template-based anticholinesterase inhibitors and antioxidants for the treatment Alzheimer's disease. Gyan Modi, Yash Pal Singh, **Shankar G**, Gourav Singh, Atanu Barik, Lovejit Singh. Patent #202111016470.
2. A multifunctional diaryl ureas-hydroxyamidine based compounds for the treatment of Alzheimer's disease. Gyan Modi, Yash Pal Singh, C. Praveen Kumar, Meenu Yadav, **Shankar G**, Gourav Singh, Saroj Kumar, S. Srikrishna. Patent #202111001482.

PATENT FILED

1. Discovery of novel tryptamine-rivastigmine analogs as potent AChE and BChE inhibitors. **Shankar G,** Gyan Modi, Sunil Kumar. Patent No. #202411081240.
2. An Imaging Probe for Detection of Key Biomarkers in Alzheimer's Disease. Gyan Modi**,** Himanshu Rai, Brijesh Singh, Saroj Kumar, Rishab Singh, Sarika

Gupta, Sairam Krishnamurthy, **Gauri Shankar**, S. Srikrishna.ICMR-202211027649. DATE OF FILING: May 13, 2022.

SEMINARS & WORKSHOPS ATTENDED:

1. Participated in a workshop on "Biological Evaluation of Brain Targeting Molecules" Held at **IIT BHU**, November 10-12, 2022.

2. Presented poster at 48th Annual Conference of Indian Immunology Society, Infections, Vaccines & Immuno-Innovations for Human Health, held at Human Genetics Department **BHU** July 8-9, 2022.

3. Participated in a sponsored Workshop on "Role of Artificial Intelligence and Machine Learning in Drug Discovery, held at the Institute of Pharmacy, Harishchandra PG College, **Varanasi,** December 12-17, 2022.

4. Presented Poster 2nd National Conference on CONTEMPORARY FACETS IN ORGANIC SYNTHESIS (CFOS-2022) in partnership with Royal Society of Chemistry, held at **IIT Roorkee**, December 01-04, 2022.