Statement of research achievements, if any, on which any award has already been received by the applicant. Please also upload brief citation(s) on the research work(s) for which the applicant has already received the award(s) (not to exceed 2000 words):

(a) Prof. Goswami has been awarded prestigious **SERB-STAR award in 2021** by **Science and Engineering Research Board, Government of India** for successful execution of the project "*Total Synthesis of Marine Macrocyclic Lactone Biselyngbyaside and Its Variants and Their Biological Activities*." as well as for his remarkable research achievement on bioactive natural product synthesis. Prof. Goswami has successfully encountered the chemical synthesis of some of the members of biselyngbyaside family of marine natural products which are known to exhibit promising anticancer activities against broad range of human cancer. During the execution of this project, the successful inclusion of Heck macrocyclization has been showcased in the presence of other sensitive olefins. The use of this powerful strategy has been explored less in literature. This approach helps others for more use of Heck macrocyclization in total synthesis of natural products. Moreover, a new modification of the Jamison protocol of trans-hydroalumination/ allylation, a crucial step in the synthesis of skipped olefin, has been developed.

Furthermore, a systematic structure–activity relationship study of one of the potent members, biselyngbyolide B, has been accomplished. A total of 11 structural variants of the parent natural product, of which 2 are natural analogues, have been studied against a human colorectal carcinoma cell line. The requisite functional units of the parent molecule responsible for the cytotoxic activities have been disclosed. Biselyngbyolide C, one of the natural analogues of biselyngbyolide B, has been studied in depth to explore its molecular mechanism. Interestingly, the *in vitro* data demonstrated an induction of dynamin-related protein 1-mediated mitochondrial fission and reactive oxygen species production which led to activation of ASK1/P38/JNK-mediated apoptosis in colon cancer cells as an important pathway for biselyngbyolide B-mediated cytotoxicity. Notably, this study revealed first that a macrolide participated in mitochondrial fission to promote apoptosis of cancer cells, providing new insight.

Ref: **(i)** ***Org. Lett., 2016, 18, 1908–1911*****. (ii)** ***Org. Biomol. Chem., 2020,18, 7151-7164*****. (iii)** ***Euro. J. Org. Chem., 2021, 2057-2076*****. (iv)** ***ACS. Med. Chem. Lett., 2024, 15, 696-705*****.**

(b). Prof. Goswami has been selected for prestigious **Bronze Medal for the year 2023 by Chemical Research Society of India (CRSI)** for his outstanding contribution in chemical synthesis of bioactive natural products and their relevant analogues having medicinal values.

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Date: 2nd August, 2024