SUMMARY

The present thesis entitled "ISOLATION, PURIFICATION AND CHARACTERIZATION OF BIOACTIVE POLYSACCHARIDES FROM EDIBLE MUSHROOMS AND POLYSACCHARIDE BASED NANOPARTICLES" is divided into five chapters:

Chapter-I:

Part A: This Part describes the general introduction to carbohydrates, polysaccharides including mushroom polysaccharides and their biological activities.

Part B: This chapter represents the introduction to nanoparticles and Polysaccharides as an excellent scaffold for nanoparticle synthesis via green route. It also covers the application of nanoparticles in various fields of modern science and technology.

Chapter-II:

It represents the experimental methodologies which were adopted during the whole course of work include in this thesis.

Chapter-III:

This chapter is one of the important parts of this thesis, which describes the isolation, purification, structural characterization and immunostimulating properties of the polysaccharide isolated from an edible mushroom *Termitomyces heimii.*

These works have been published in **Carbohydrate Polymers, 2015,** 134, 375–384.

Chapter-IV:

This chapter describes the isolation, chemical analysis and immuno-enhancing properties of the polysaccharide from an edible mushroom *Lentinus fusipes*.

This work has been published in **Carbohydrate Polymer, 2017,** 157, 1657-1565.

Chapter-V: It deals with the synthesis of silver nanoparticles (AgNPs) using a hetero polysaccharide (consisting of glucose, fucose and galactose), extracted from the *Lentinus squarrosulus* (Mont.) Singer and its effectiveness as a antibacterial agent along with its DNA degradation capability and toxicity over human RBCs.

This work is published in ***International Journal of Biological Macromolecules (2015).*** *80,* 455–459.

List of Publications

1. **D. K. Manna,** A. K. Nandi, M. Pattanayak, P. Maity,S. Tripathy, A. K. Mandal, S. Roy, S. S. Tripathy, N. Gupta, S. S. Islam. *A water soluble β-glucan of an edible mushroom Termitomyces heimii: Structural and biological investigation*, **Carbohydrate Polymers;** 134, 375–384, **2015**.
2. **D. K. Manna**, A. K. Mandal, I. K. Sen, P. K. Maji, S. Chakraborti, R. Chakraborty, S. S. Islam. *Antibacterial and DNA degradation potential of silver nanoparticles synthesized via green route*. **International Journal of Biological Macromolecules**; 80, 455–459, **2015**.
3. M. Pattanayak, S. Samanta, P. Maity, I. K. Sen, A. K. Nandi, **D. K. Manna**, P. Mitra, K. Acharya, S. S. Islam. *Heteroglycan of an edible mushroom T.clypeatus: structure elucidation and antioxidant properties.* **Carbohydrate Research** 41, 30-36, **2015**.
4. **D. K. Manna**, Ashis K. Nandi, M. Pattanayak, P. Maity, A. K. Mandal, N. Gupta and S. S. Islam**.** Structural elucidation and immune-modulating property of a novel heteroglycan extracted from an edible mushroom *Lentinus fusipes.* **Carbohydrate Polymer. 157, 1657-1565, 2017.**
5. M. Pattanayak, S. Samanta, P. Maity, **D. K. Manna,** I. K. sen, A. K. Nandi, S. Chattopadhyay, S. Roy, S. S. Tripathy, A. K. Sahoo, N. Gupta, S. S. Islam. Polysaccharide of an edible truffle *Tuber rufum*: Structural characterization and effects on human lymphocytes. **International Journal of Biological Macromolecules**; 95, 1037–1048, **2017**.
6. M. Pattanayak, P. Maity, S. Samanta, I. K. sen, **D. K. Manna,** A. K. Nandi, S. Ghosh, K. Acharya, S. S. Islam. Studies on structure and antioxidant properties of a heteroglycan isolated from wild edible mushroom *Lentinus sajor-caju*. **International Journal of Biological Macromolecules**; 5, 1037-1048, **2017**.
7. B. C. Panda**,** P. Maity, Ashis K. Nandi, M. Pattanayak, **D. K. Manna**, S. Mondal, S. Tripathy, S. Roy, K. Acharya, S. S. Islam. Heteroglycan of an edible mushroom *Pleurotus cystidiosus:* Structuralcharacterization and study of biological activities. **International Journal of Biological Macromolecules**; 95, 833–842, **2017**.

8. P. Maity, Ashis K. Nandi, **D. K. Manna**, M. Pattanayak, I. K. sen, S. K. Bhanja, S. Samanta, B. C. Panda, S. Paloi, K. Acharya, S. S. Islam. Structural characterization and antioxidant activity of a glucan from *Meripilus giganteu*. . **Carbohydrate Polymer. 157, 1237-1245, 2017.**