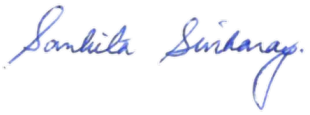
ABSTRACT

Cancer-related mortality is a huge burden worldwide. One of the alternatives to chemotherapy and radiotherapy is photodynamic therapy (PDT), developed first in the 1980's and has demonstrated improved action against certain types of tumors when compared to the former therapeutic methods. PDT employs the combination of a photosensitizer, light, and oxygen to generate singlet or reactive oxygen species that destroy tumor cells. A major drawback of PDT with the current approved agents is the limited light penetration through tissues with a restrained application to superficial tumors and incomplete resolution of tumor mass. When a diagnostic component is simultaneously added to PDT, we will be able to effectively quantify tumor mass destruction at the time of PDT or immediately after, thereby serving as a theranostic agent that will enable improved therapeutic guidance. This work describes the development of a class of such small molecule theranostic probes, based on the scaffold of phthalocyanines, which can act as PDT agents and also produce a photoacoustic signal/image to diagnose the tumor mass before and after application of PDT.

Keywords: theranostic probes, photodynamic therapy, photoacoustic imaging, pancreatic cancer



Dr. Sanhita Sinharay
Assistant Professor,
Department of Bioengineering,
Indian Institute of Science, IISc
Bengaluru - 560012