

Synopsis Seminar

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Seminar Title	: Development of novel carbon quantum dot sensors for detection of environmental pollutants and biomarkers
Speaker	: Lingaraj Behera ( Rollno : 519cy1008)
Supervisor	: Prof. Sasmita Mohapatra
Venue	: Seminar room, CY department
Date and Time	: 20 Nov 2024 (4 pm)
Abstract	: Driven by its simplicity, low-cost, high sensitivity, and utility, carbon-based optical biosensors have been extensively researched as an alternative tool to aid scientists in identifying environmental pollutants and important biomolecules. The main focus of this doctoral research work is to design metal doped carbon quantum dots sensors, sensing protocols, and to explore the practical applications of these sensors in the detection of the analytes in aqueous medium, real samples and model plant or living organisms. We have synthesized Mn doped CD(Mn-CD), Ag-doped CD(Ag-CD), and biosource derived carbon dot for the detection of environmental pollutants arsenic and organoarsenic compounds, perchlorate, hexavalent Cr(VI). All these sensor probes can selectively detect the intended analyte in aqueous medium and plant samples. Further due to good translocation properties these sensor nanoprobe have been used to detect heavy metals in different parts of the plants through confocal imaging. In the direction of biomarker detection we have developed 2 metal integrated carbon dots for detection of glycine, dopamine and Ca <sup>2+</sup> in sweat. Due the unique combination of fluorescence property of CD, conductance property along with molecular recognition, these sensors can detect analytes in both fluorescence and electrochemical mode. The details of our effort have been discussed in respective chapters.