National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: The mechanism behind the therapeutic role of Alpha-tocopherol in mitigating hypobaric hypoxia-induced eye defect in Drosophila melanogaster
Speaker	: Seekha Naik (521ls2003)
Supervisor	: Santosh Kumar #2787
Venue	: LS Seminar Hall
Date and Time	: 21 Mar 2025 (16:30 hrs)
Abstract	: : Hypoxia, or reduced oxygen levels, is associated with various pathological conditions, including retinopathies. The retina, being highly metabolically active, is particularly vulnerable to damage under low oxygen conditions, leading to its degradation. However, the developmental impact of hypobaric hypoxia on eye formation remains poorly understood. In this study, Drosophila melanogaster serves as the model organism to explore the effects of hypobaric hypoxia on eye development and the potential protective role of Alpha-tocopherol. Hypoxic conditions were simulated by exposing Drosophila to hypobaric pressure (120 mbar). Histological analysis revealed that hypoxia induces eye defects at various developmental stages. Biochemical assays confirmed the presence of reactive oxygen species, which caused cellular damage and DNA injury. Furthermore, quantitative PCR demonstrated the upregulation of key genes involved in eye development, including Puf, Wge, and Twr, under hypoxic conditions. Treatment with Alpha-tocopherol mitigated these defects, restoring normal eye development. This study lays the groundwork for understanding the effects of oxygen deprivation on ocular development and highlights Alpha-tocopherol as a promising therapeutic agent for hypobaric hypoxia-induced disorders. Keywords: Hypobaric hypoxia, Compound eye, Alpha-tocopherol, Reactive Oxygen Species, Drosophila