



ORAL DEFENCE ANNOUNCEMENT



ARIJIT MAITY

STRUCTURAL AND DYNAMICS STUDY OF G-RICH SEQUENCES RELEVANT TO GENOMIC DISORDERS

Aberrant DNA repeat expansions has been linked to several (> 30) neurological and muscular disorders. In this dissertation we present structural studies performed on two such repeat sequences GGGGCC and TGG using Nuclear Magnetic Resonance Spectroscopy (NMR) and other biophysical techniques. The GGGGCC repeat in human chromosome 9 was recently identified as the most common genetic abnormality in familial ALS/FTD. The TGG repeat is present in abundance in multiple genomic locations that are associated with neurodevelopmental abnormalities and spinocerebellar ataxia. Given the fact that complex DNA and/or RNA secondary structures are hypothesized to play crucial roles in the development of the diseases, structures obtained from our work provides new target for the concerned diseases. Furthermore, the structure obtained from the TGG repeat sequence study also helps to unravel the folding principles of G-quadruplex structures of sequences devoid of consensus G_{3+} tracts and containing irregularly spaced short G-tracts.

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