Novel Molecular Imaging Diagnostics for Dementia

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Abstract—*A large proportion of the global geriatric population is plagued with a myriad of neurodegenerative syndromes. Epidemiological findings have established dementia as the most prevalent ageing related pathology. The worldwide reporting of dementia cases has drastically increased over the previous decade, owing to the advancements in the domain of medical diagnostics. Non- invasive medical imaging has brought about a reform in the paradigms of dementia diagnostics, which has otherwise always proved to be the Achilles's heel for the timely implementation of therapeutic interventions by healthcare professionals. There is still a long way to go in the development of efficacious therapeutic strategies for dementia; however innovations leading to early diagnostic evaluations play a major role in improving patient wellbeing by enabling timely clinical intervention. The molecular imaging techniques of PET/CT (Positron Emission Tomography/Computed Tomography) and SPECT (Single Photon Emission Computed Tomography) have enabled researchers and clinicians alike to delve deeper into the molecular mechanisms underlying the pathophysiology of dementia. The aggregation of misfolded proteins, due to defects in normal physiological processes, is a crucial part of the pathogenesis of dementia and allied syndromes. The molecular imaging modalities of PET/CT and SPECT aid in the in situ study of such pathological phenomenon, thereby assisting in the prospective diagnosis of dementia at a preclinical stage. Novel molecular imaging radiotracers have been discussed that have the potential to transform dementia care.*

Keywords: *Dementia, Molecular Imaging, PET/CT, SPECT, Radiotracers*