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Sommario/riassunto

In the past two decades there have been significant advances made in understanding the cellular and molecular alterations that occur with brain ageing, as well as with our understanding of age-related brain diseases. Ageing is associated with a mid-life decline in many cognitive domains (eg. Attention, working memory, episodic memory) that progresses with advancing age and which may be potentiated by a variety of diseases. However, despite the breadth of attempts to explain it, the underlying basis for age-related memory impairment remains poorly understood. Both normal and “pathological” ageing (as in age-related neurodegenerative disorders such as Alzheimer’s disease) may be associated with overlapping and increased levels of “abnormal” pathology, and this may be a potential mediator of cognitive decline in both populations. An emerging hypothesis in this field is that metal ion dys/homeostasis may represent a primary unifying mechanism to explain age- and disease-associated memory impairment – either indirectly via an effect on disease pathogenesis, or by a direct effect on signaling pathways relevant to learning and memory. There remains a concerted worldwide effort to deliver an effective therapeutic treatment for cognitive decline associated with ageing and/or disease, which is currently an unmet need. There have been numerous clinical trials conducted specifically testing drugs to prevent cognitive decline and progression to dementia, but to date the results have been less than impressive, highlighting the urgent need for a greater understanding of

the neurobiological basis of memory impairment in ageing and disease which can then drive the search for effective therapeutics.