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Utilization of yeast to find compounds that promotes cell health

Poor diets can greatly reduce our lifespan but there is less evidence on what drugs and dietary components can increase our lifespan and reduce or ameliorate age-related diseases. Decreased protein turnover is related to age-associated diseases including the major age-related neurodegenerative diseases. I have developed a convenient yeast-based assay that can be used to “report” products that improve protein turnover in aged cells. Yeast has been engineered to produce the deleterious Alzheimer’s disease protein (amyloid β) fused to green fluorescent protein. Young cells readily remove the amyloid β while older cells don’t do it well. This is an innovative approach to screen for compounds that are bioavailable and restore youthful characteristics of cells. Compounds that restore youthfulness to older yeast, lead to increased amyloid β turnover. Such compounds may be useful in restoring cell health to people. Is yeast an appropriate model? At the cellular level yeast provide an accurate model of human cells. Like us they are eukaryotes and our knowledge about human biology and the knowledge of our genome has been greatly assisted by yeast studies. Budding yeast are also excellent models for ageing. For example, approximately half of the population will be newly budded, one quarter will be first-time mothers and one eighth will be second time mothers, etc. In a yeast culture all cells have the same genes but there are many differences due to age. The engineered yeast offer a new way forward to rapidly screen for new classes of compounds to remove deleterious proteins like amyloid β .

Biography

Ian Macreadie has completed his PhD at Monash University in 1983 and then embarked on Postdoctoral studies at The University of Texas Health Science Center at Dallas, Texas. He has returned to Australia to be a Project Leader at CSIRO for 24 years, earlier worked as Chief Scientific Officer of Sienna Cancer Diagnostics. He is currently involved in Teaching and Research into Alzheimer Disease at RMIT University, Australia. He has published more than 140 peer-reviewed papers. He serves on the Editorial Boards of a number of scientific journals and he is an Editor in *Microbiology Australia*.

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