

P008 Biology of Ageing e-Science Integration and Simulation (BASIS) System

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Although rapid progress is being made in understanding individual components of the ageing process, knowledge is currently fragmented. We have developed a biology of ageing e-science integration and simulation (BASIS) system, an innovative biomathematical and bioinformatics modelling tool, to allow integration of data and hypotheses from diverse biological sources. The BASIS system initially considers a 'virtual' ageing cell, but will also investigate a variety of virtual ageing tissues and a virtual ageing organism (*C. elegans*). The virtual ageing cell is developed using a set of interacting modules to represent key variables and reaction pathways within the cell. Examples of key features that are in development are accumulation of damage to nuclear, telomeric and mitochondrial DNA, free radical generation, the antioxidant defense system, heat shock proteins and protein turnover, and the function of genes affecting longevity such as Sir2. The system has been used to investigate the contribution of these mechanisms to cellular ageing. BASIS is designed to allow the user not only to alter existing modules but also to construct their own model components and is available to external users through a web interface at www.basis.ncl.ac.uk.