

Poster presentation

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## Modelling Lipid Metabolism to Improve Healthy Ageing

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from BioSysBio: Bioinformatics and Systems Biology Conference  
Edinburgh, UK, 14–15 July 2005

Published: 21 September 2005

BMC Bioinformatics 2005, 6(Suppl 3):P21

Lipid metabolism has a key role in human longevity and healthy ageing. This has been demonstrated by a recent genetic study examining the lipoprotein phenotype in individuals with exceptional longevity, in a population of Ashkenazi Jews [1]. It is highly probable such subjects with exceptional longevity, have avoided cardiovascular disease (CVD). CVD is the primary cause of mortality in developed countries. Among the risk factors for CVD, elevated plasma cholesterol has consistently stood out. In response, the pharmaceutical industry has produced a wide range of agents for lowering plasma cholesterol. These work well, but are generally expensive and may pose further health problems. It is therefore important that novel, effective and risk-free ways are developed to control elevated plasma cholesterol. The goal of our work, is to use mathematical modelling to infer nutrition-based interventions, which may help to prevent the dysregulation of lipid metabolism that leads to CVD. Furthermore we are aiming to gain a better understanding of how disease-free ageing can be extended. To do this we are developing a model of cholesterol homeostasis. With the model we can monitor changes in the state of key variables, such as LDL-cholesterol. The model definition is being developed using Systems Biology Markup Language (SBML).

### References

1. Barzilai N, Atzmon G, Schechter C, Schaefer EJ, Cupples AL, Lipton R, Cheng S, Shuldiner AR: **Unique lipoprotein phenotype and genotype associated with exceptional longevity.** *Jama-Journal of the American Medical Association* 2003, **290(15)**:2030-2040.