Lipid analysis in long-living bivalves supports the membrane-pacemaker theory of aging.

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Membrane lipids of cells and organelles differ from other targets of reactive oxygen species in contributing themselves to pro-oxidants mechanisms by undergoing a chain reaction that release reactive aldehydes. The propensity of membranes to chain reaction following attack by ROS is a function of the degree of unsaturation of its fatty acids and these two traits are inversely correlated to longevity in mammals and birds. In order to determine if these correlations are found in other metazoan taxa, we investigated the lipid composition of gills mitochondrial membranes of four species of clams of the veneroidae order: *Mya arenaria*, *Spisula solidissima*, *Mactromeris polynyma*, and *Arctica islandica*. These bivalve molluscs differ in reported longevity with respective maximums of 13, 40, 61 and 405 years old and *A. islandica* is currently known as the longest living metazoan animal species.

Clams were kept at a common temperature and food regime during 3 months before lipid analysis. Mitochondrial polar lipids carbon chain were trans-methylated in acidic condition to produced fatty acids methyl esters and dimethyl acetals that were analyzed together using GC-MS. Preliminary results indicate that *A. islandica* have lower level of membrane lipids unsaturation compared to the other species.