

Evolution of gene family in eukaryotes: the BCL-2 gene family - (session: Comparative Genomics and Molecular Evolution)

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The members of the Bcl-2 family can be subdivided into anti-apoptotic and pro-apoptotic proteins. A delicate balance between these members exists in each cell and the regulations of these two groups of proteins determines whether the cell survives or undergoes apoptosis. In mammals 15 Bcl-2 family members have been identified to date and other similar members have been found in various eukaryotic organisms. All members possess at least one of the four motifs known as Bcl-2 homology domains (BH1 to BH4). Most pro-survival members of Bcl-2 family, which can inhibit apoptosis in the face of a wide variety of cytotoxic insults, contain at least BH1 and BH2 domains; those most similar to Bcl-2 have all four BH domains. All the Pro-apoptosis family members possess BH3 domain which is the central domain.

Our interest in the studies of gene family evolution has focused on the cladistic analyses of Bcl-2 gene family members. These proteins show a different composition with regard to the functional domains BH1, BH2, BH3 and BH4. The analyses were performed both on complete sequences (140 sites analysed) and on single domains. We present the results obtained using both approaches.