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Recent advances in biotechnology as a biochemist

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Ediorial Note

Caspases are critical for a cell functioning. To understand the functioning of human caspases different model organisms could be Considered [1]. Our study suggests that human executioner caspases, initiator caspases and inflammatory caspases shows different level of association with the model organisms under study. This study suggests that for human caspases related studies either Pan troglodytes or Felis catus should be considered based on the extent of sequence similarity [2]. This clearly indicates that we should rethink while performing experiments on Mus musculus, as it may not show the same level of association, thereby may lead to decrease in the efficacy of drug designed for humans and tested on mouse [3].

DNA Cloning

Caspases which have long prodomain are believed to be upstream initiator caspases. Casp 8 and 10 contain two DED domains within their prodomain [4]. Homotypic interactions occur between DEDs of Casp 8 and 10 and DEDs of adapter molecule, FAS-Associating Protein with Death Domain (FADD), induce the recruitment of caspases to death receptors and lead to caspase activation. Casp 1,4,9,2 consists of CARD domain. CARDs of these caspases interact with CARD-containing adapter molecules [5]. These caspases activate the effector caspases. Initiator apoptotic caspases and inflammatory caspases contain prodomains of over 100 amino acids, while the prodomains in effector caspases are usually less than 30 amino acids. The short prodomains of executioner caspases are unlikely to mediate protein-protein interactions. Rather, they seem to inhibit caspase activation [6]. Initiator caspases: casp2, casp8, casp9, casp10. These caspases activate the effector caspases.

Human disease gene homologs with Drosophila and show 75% of human disease genes are structurally related with the gene present in Drosophila and more than third of human gene are highly related to fruit fly [7]. Model organisms such as mouse, zebrafish, frog, and chicken seem to show some extent of relativity with the human system. Thus, they can be used to perform experimentation to understand the diseased state and thereby relevant treatment for the same. Humans and chimpanzees share 98% of significant matches at the nucleotide level. It has been found that the protein-coding genes are showing high correlation. The genetic comparison is not simple due to the nature of gene repeats and mutations (Chimpanzee sequencing consortium) [8]. Chimpanzees have 48 chromosomes, two more than humans. It is thought that this is because, in a human ancestor, two pairs of chromosomes fused into a single pair.

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