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Cellular self-destruct program has deep roots throughout evolution

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In what seems like a counter-intuitive move against survival, within animals, some cells are fated to die from the triggering of an elaborate cell death program, known as apoptosis. Now, Sakamaki et. al., have honed in on understanding the evolution of caspase-8, a key cell death initiator molecule that was first identified in humans.

By performing the most extensive evolutionary analysis of the Casp8 protein to date, they found that Casp8 activity arose very early (more than 500 MYA), and is universally conserved throughout evolution, demonstrating its functional significance throughout the animal kingdom.

"It is of great significance that the programmed cell death system is established in more simpler animals," said professor Sakamaki.

In addition, they were able to substitute Casp8 proteins from non-mammalian examples and trigger the same cell death pathways when placed into cultured mammalian cell experiments using a killing assay, demonstrating its universal functionality in evolution. They also demonstrate that key protein interactions between Casp8 and another called FADD are also observed across the animal kingdom.

Thus, the cell death toolkit is of core importance to animal evolution, with cell death occurring to eliminate unnecessary, non-functional, unhealthy, or dangerous cells from the body. "In mammals, the cells producing a death ligand and expressing death receptor (and

FADD/casp8) are different, suggesting that cell-cell communication is required for this vital phenomenon," said Sakamaki.

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