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PROTEIN FROM BUDGETT'S FROG CAN BLOCK ENZYMES OF DISEASE-CAUSING PATHOGENS: STUDY

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According to researchers, frogs have developed a defensive mechanism through their skin, which helps to combat microorganisms.

Researchers from the Indian Institute of Science's (IISc.) molecular biophysics unit in a study have identified that peptides (short protein) produced from Budgett's frog can combat enzymes of disease causing pathogens

According to IISc., peptides (short proteins) produced from the skin of amphibians have long been studied because of their ability to counter unfavourable conditions in the environment, including harmful pathogens.

Mihir Rami, Mohd. Shafique, and Siddhartha Sarma at the unit have studied LL-TIL, one such peptide found in skin secretions of Budgett's frog.

According to Mr. Rami, Budgett's frog found in South America is kept as a pet in many countries because of their intelligent behaviour.

"Frogs are the first vertebrates to conquer the land and all other vertebrates like reptiles, mammals, and birds came after the amphibians. Because of this the frogs have developed a defensive mechanism through their skin. They generally combat the microorganisms and other harmful things through their skins," said Mr. Rami.

The IISc. said that the researchers found that the frog-secreted peptide inhibited two key enzymes called subtilisin carlsberg and proteinase K., produced by pathogens.

"These enzymes play a pivotal role in promoting infections by degrading specific protective proteins of the infected person. The team used various spectroscopic techniques and protein assays to study the binding of the amphibian peptide to the pathogenic enzymes. The peptide was shown to act through a slow-tight binding pathway, and was found to be as effective as SSI, a well-known subtilisin inhibitor," said IISc.

The study further revealed an in-depth mechanism of this inhibitory action, using structural and

dynamic models. The researchers show the formation of a Michaelis complex – a tight, noncovalent complex with the intact inhibitor – during the process. They also studied the effects of modifications to the original sequence of the peptide.

“This provides a framework to engineer more specific and potent TIL-type inhibitors, which can be used against other pathogenic enzymes as well,” IISc. said.

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