Guoxing Quan, J Biotechnol Biomater 2017, 7:3(Suppl)
DOI: 10.4172/2155-952X-C1-076

Molecular cloning and characterization of the small heat shock protein family in the spruce budworm, *Choristoneura fumiferana*

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Small heat shock proteins are a superfamily of molecular chaperones and are characterized by the presence of a conserved α-crystallin domain. They exhibit ATP-independent chaperone-like activity by assisting in the correct folding of nascent and stress-accumulated misfolded protein to prevent irreversible protein aggregation. Unlike HSPs of large molecular weight, the sHSPs display structural and functional diversity among different insect species. Some sHSPs may contribute to stress tolerance, enhancing insect survival in severe environmental conditions. As such, studying SHSPs may lead to a better understanding of how pest insect survives in unfavorable environments and how the changing climate affects their distribution and outbreaks. The spruce budworm, *C. fumiferana* is a destructive native forest defoliator in North America. In the past few hundred years, periodic outbreaks are known to have occurred across tens of millions of square kilometers of forest. Here, we report the identification of 15 sHSP genes from the spruce budworm transcriptome. Examination of the mRNA expression profiles of the sHSPs revealed that the levels varied according to the developmental stage and tissue as well as whether the insects were reared under normal and stress conditions. Nine sHSP genes were sensitive to heat shock stress. Some, but not all, sHSPs may play a vital role during diapause.

Biography

Guoxing Quan received his PhD degree in 1998 from Tokyo University of Agriculture and Technology, Japan. He worked as a Postdoctoral Fellow in Japan and Canada for several years. Currently, he is a Research Scientist working at Great Lakes Forestry Centre, Sault Ste. Marie, Ontario. He has published more than 20 papers and been a reviewer for many scientific journals. He has worked on transgenic silkworm, RNAi and owns three patents. His current research focuses on the identification of genes involved in adapting to unfavorable environmental conditions and how the changing climate affects insect distribution and outbreaks.

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