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Abstract

Bombyx mori ATG6 Protein Comparison with Other Model Species by Bioinformatic Analysis

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Abstract

Background and Aim: Beclin-1, also known as ATG6, is a critical protein in autophagy regulation. It forms the Beclin-1/Vps34/ATG14L complex, crucial for starting autophagy. Our study aims to understand how Beclin-1 interacts with other proteins and its role in autophagy, contributing to our knowledge of cellular processes and potential therapeutic applications.

Method: To gain a better understanding of the conservation of ATG6 in different organisms, bioinformatic analyses were performed to compare the ATG6 protein sequence of *Bombyx mori* with those of other model organisms.

Results: The analyses revealed that the ATG6 protein sequence is highly conserved across different organisms, particularly in the N-terminal region and coiled-coil domain. In addition, conserved amino acid motifs were detected in these functional regions, suggesting that they have critical roles in the regulation of autophagy. Specifically, the N-terminal region contains a BH3 domain that interacts with BCL-2 family proteins, and the coiled-coil domain is involved in the formation of the Beclin-1/Vps34/ATG14L complex. Comparison of the ATG6 protein sequence of *Bombyx mori* with those of other model organisms revealed that the protein is highly conserved among different species, with similarities ranging from 70% to 99%. This high level of conservation suggests that the regulation of autophagy by ATG6 is a critical and evolutionarily conserved process. This information can be used to design experiments to study specific regions of the protein and identify potential drug targets for modulating protein activity. Inhibition of ATG6 protein formation may also be a potential therapeutic strategy for cancer treatment. Additionally, it can be used for biological processes such as autophagy and apoptosis.

Conclusion: In conclusion, the high conservation rate of the ATG6 protein in *Bombyx mori* demonstrates its critical role in the autophagy process and suggests that this process is evolutionarily conserved. Therefore, structural and functional analyses of the ATG6 protein in *Bombyx mori* can provide similar results in other organisms and contribute to a better understanding of the autophagy process and expanding its applications.

Keywords: *ATG6 protein, Autophagy, Evolutionarily conserved process, Bombyx mori, Bioinformatic analysis.*

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