ALPHA-L-FUCOSIDASE AND FUCOSYLTRANSFERASES FROM NEPHILENGYS CRUENTATA

Perrella, N.N.1,2; Fuzita, F.J.3; Pinkse, M.W.4; Verhaert, P.D.4; Lopes, A.R.1

1 Laboratório de Bioquímica e Biofísica do Instituto Butantan, São Paulo, Brasil
2 Programa de pós-graduação em Biotecnologia, ICB, USP, São Paulo, Brasil
3 Laboratório de Bioquímica de Insetos, IQ, USP, São Paulo, Brasil
4 Analytical Biotechnology, TUDelft, Delft, Netherlands

Introduction: Fucosylated glycans are involved in many physiological processes and pathological conditions as cancer, diabetes and cystic fibrosis and these processes are regulated by fucosidases and fucosyltransferases. Fucosidases are glycosyl hydrolases which cleave glycosidic bounds of fucosilated proteins, lipids, carbohydrates or sulfated polymer of fucose. Fucosyltransferases transfer fucose residues to glycans. Fucosidase activity was identified on the digestive tract of the spider Nephilengys cruentata. Previously, we have identified, characterized and sequenced by transcriptomic and proteomic techniques one alpha-L-fucosidase from this spider. New sources of these enzymes are interesting to the study of specificity, mechanism and possible application. Objectives: Check by quantitative PCR (qPCR) if alpha-L-fucosidase is an enzyme exclusively expressed in the digestive tract (MMG) of the spider N. cruentata and identify and correlate the sequences of fucosyltransferases sequenced by transcriptomic and proteomic techniques. Methods: N. cruentata females were immobilized on ice and their MMG, silk gland and carcass were isolated and used to RNA extraction and qPCR analysis. N.cruentata proteomic nano LC-MS/MS analysis used the soluble fraction from MMG homogenate as samples. Transcriptomic and proteomic data were used to identify fucosidases and fucosyltransferases. Results and discussion: qPCR data showed that alpha-L-fucosidase is not exclusively expressed in the MMG of N. cruentata which corroborate previous results which indicated that alpha-L-fucosidase is an intracellular enzyme. Human fucosyltransferases are separated into four families according to their structure and function/specificity. The different and completes fucosyltransferases sequences were identified by transcriptomic and proteomic analysis from N. cruentata MMG and correlated to human fucosyltransferases by alignments analysis. Conclusions: These data are contributing to understand fucose metabolism in Arachnida. Future immunolocalization assays will be performed to determine the exact location of alpha-L-fucosidase and this will allow the proposing of its role.

Key words: Arachnida, alpha-L-Fucosidase, Fucosyltransferase

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