Formation of AT-AC A complex

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Introduction

Reactome is open-source, open access, manually curated and peer-reviewed pathway database. Pathway annotations are authored by expert biologists, in collaboration with Reactome editorial staff and cross-referenced to many bioinformatics databases. A system of evidence tracking ensures that all assertions are backed up by the primary literature. Reactome is used by clinicians, geneticists, genomics researchers, and molecular biologists to interpret the results of high-throughput experimental studies, by bioinformaticians seeking to develop novel algorithms for mining knowledge from genomic studies, and by systems biologists building predictive models of normal and disease variant pathways.

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Literature references

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Sidiropoulos, K., Viteri, G., Sevilla, C., Jupe, S., Webber, M., Orlic-Milacic, M. et al. (2017). Reactome enhanced pathway visualization. *Bioinformatics, 33*, 3461-3467. ↗

Fabregat, A., Jupe, S., Matthews, L., Sidiropoulos, K., Gillespie, M., Garapati, P. et al. (2018). The Reactome Pathway Knowledgebase. *Nucleic Acids Res, 46*, D649-D655. ↗

Fabregat, A., Korninger, F., Viteri, G., Sidiropoulos, K., Marin-Garcia, P., Ping, P. et al. (2018). Reactome graph database: Efficient access to complex pathway data. *PLoS computational biology, 14*, e1005968. ↗

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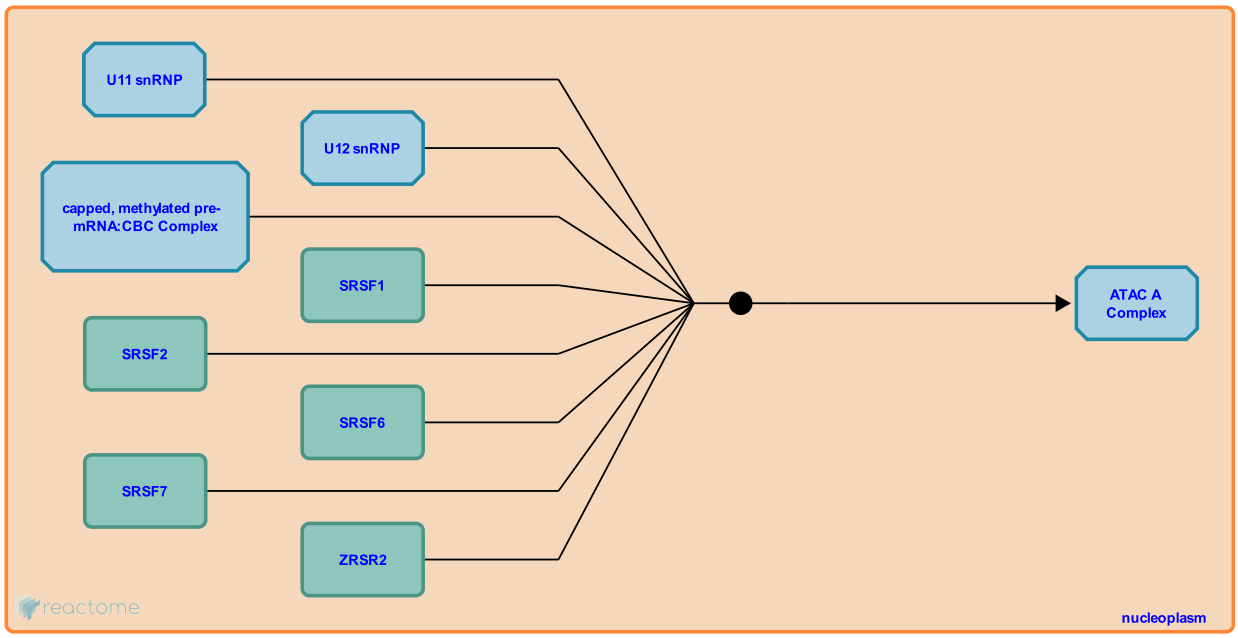
Stable identifier: R-HSA-75080

Type: binding

Compartments: nucleoplasm



U12-type AT-AC introns are distinguished from the major U2-type introns by the consensus sequences of their highly conserved splicing signals. U12 introns have the 5' ss consensus sequence (G/A)TATCCTTT, the branchpoint sequence TTTCCTTAACT and the 3' ss (C/T)AG. Initial recognition of AT-AC introns involves interaction of U12 snRNP with the branch-point sequence and U11 with the 5' ss. Unlike the major splicing pathway, U11 and U12 are in a complex and interact with the pre-mRNA simultaneously, binding in an ATP-dependent manner as a di-snRNP complex and likely bridging the 5' ss and 3' ss region.

Twenty proteins have been identified in the U11/U12 di-snRNP complex including the snRNP Sm proteins B', B, D3, D2, D1, E, F, and G which are identical to the major splicing pathway Sm proteins. A U2 snRNP core protein complex, SF3b is also found in the U11/U12 di-snRNP, including p14, a protein that interacts with the branchpoint adenosine.

SR proteins are required for formation of A complex in AT-AC splicing. The same SR proteins involved in splicing of the major introns are also active in splicing of AT-AC introns, though, as in the major pathway, there is substrate specificity.

Literature references

Hastings, ML., Krainer, AR. (2001). Functions of SR proteins in the U12-dependent AT-AC pre-mRNA splicing pathway. *RNA, 7*, 471-82. ↗

Editions

2003-10-28	Authored	Joshi-Tope, G.