ALTERNET: Using Splice factors in Alternative splicing aware GRNs

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In a previous project, we have successfully employed transcription factor isoform data to obtain GRNS accounting for the possibility to obtain multiple protein versions though alternative splicing.

In this project, this framework is to be extended. The goal is to use Transcription factors (Transcription factor isoforms) and Splice Factor expression to predict the expression of a target gene. This is done using an existing framework, GRNboost2, which employs random forests for the prediction.

The goal of this project is to:

    A. Use GRNboost with TFs and SFs as predictors and gene isoforms as targets
    B. Incorporate these changes into the existing project, Alternet
    C. Validate these findings using plausibility filtering and case studies.
    D. Write a python module which streamlines this analysis

Requirements:

    – Python
    – Strong interest in Molecular biology

Project may be extended to a Master's Thesis