

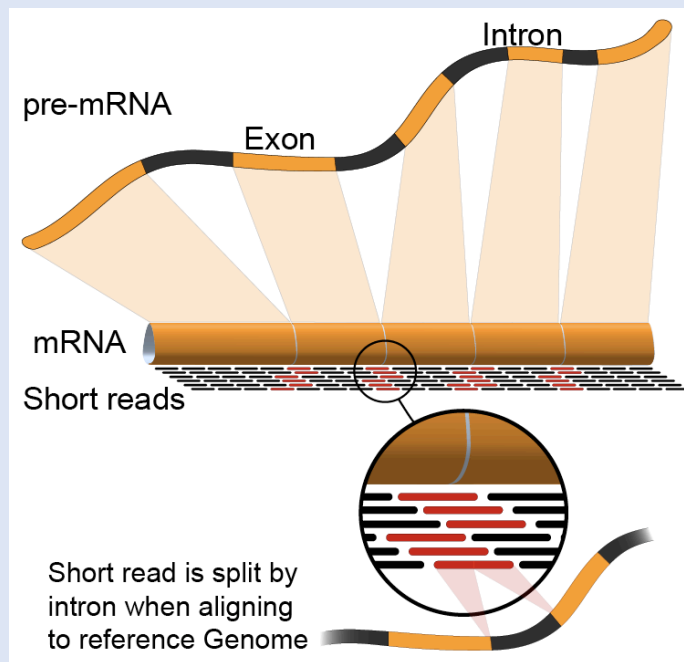
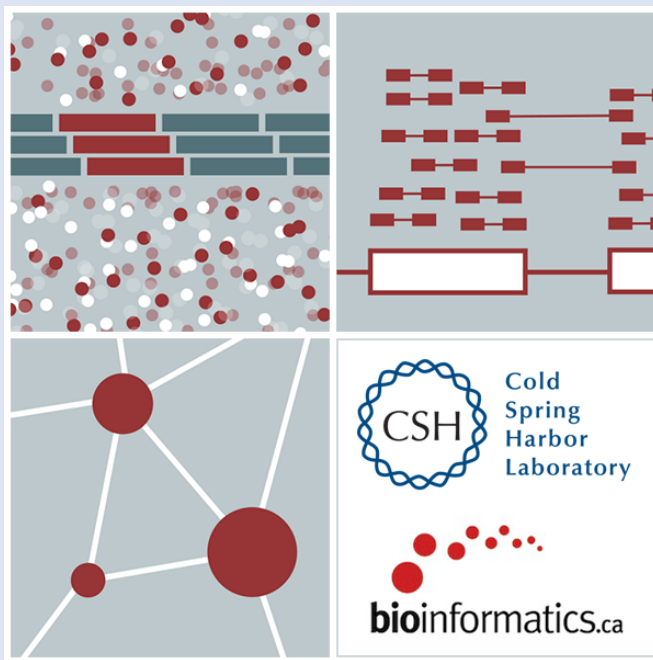


Cold
Spring
Harbor
Laboratory

RNA-Seq Module 5

Alternative Splicing Analysis

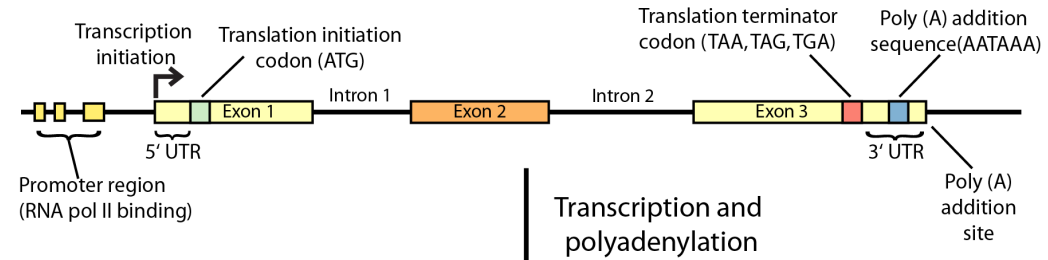
John Chamberlin, Kelsy Cotto, Felicia Gomez, Obi Griffith, Malachi Griffith, Simone Longo, Allegra Petti, Aaron Quinlan, Megan Richters, Huiming Xia
Advanced Sequencing Technologies & Bioinformatics Analysis November 16-20, 2020



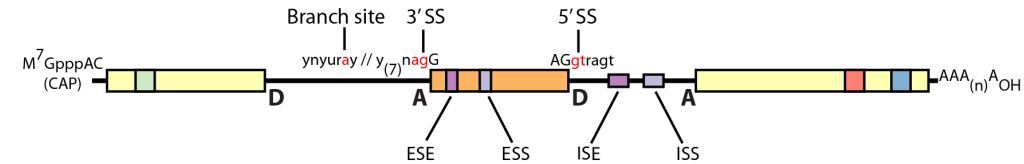
 Washington University in St. Louis
SCHOOL OF MEDICINE

Review of gene expression

Double-stranded genomic DNA template

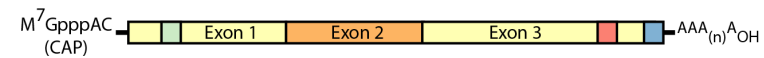


Single-stranded pre-mRNA (nuclear RNA)



RNA processing

Mature mRNA

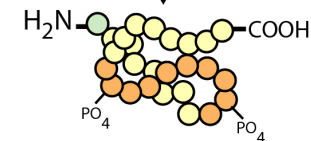


Export to cytoplasm and translation

Protein (amino acid sequence)

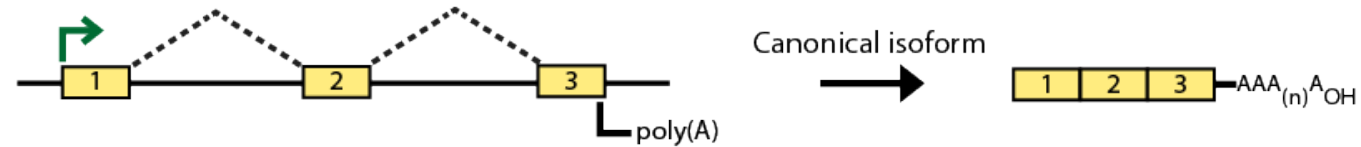


Folding, posttranslational modification, subcellular localization, etc.

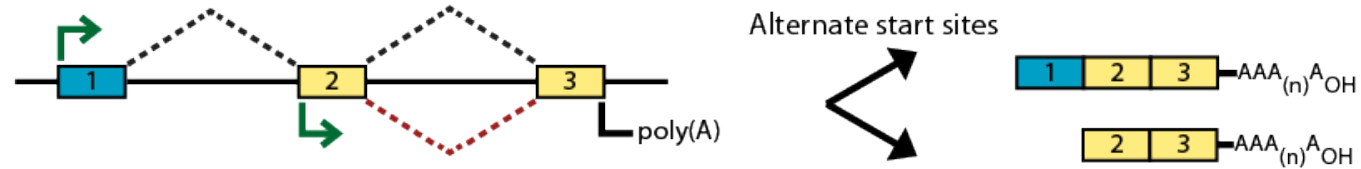


Types of alternative expression - part 1

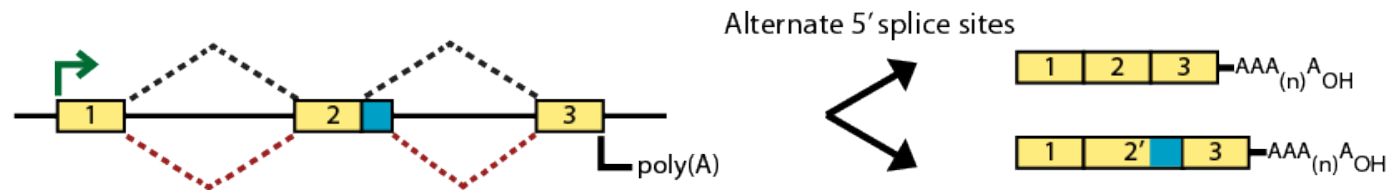
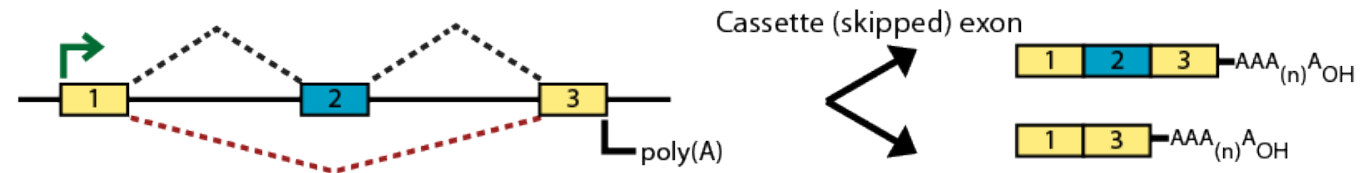
Simple transcription



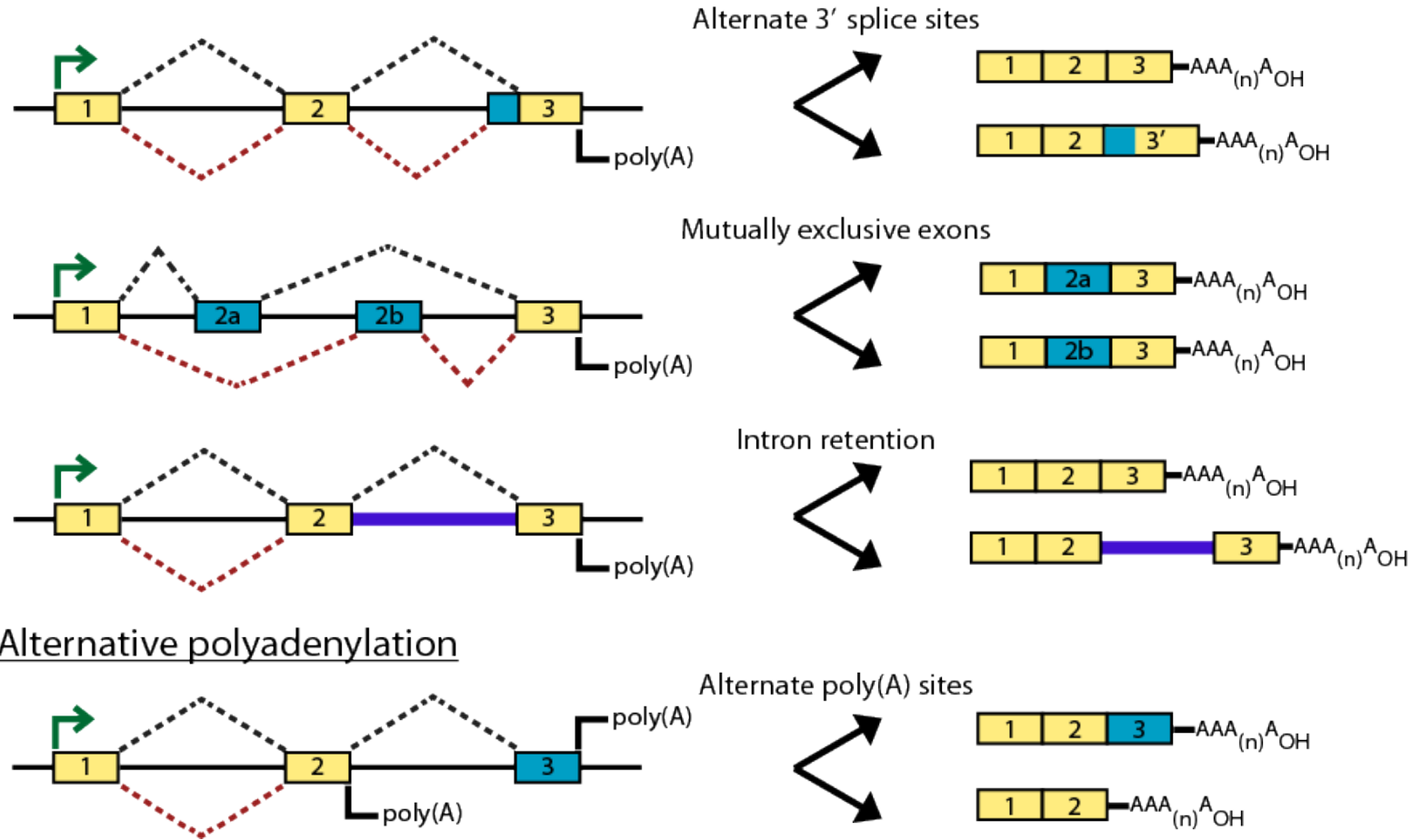
Alternative transcript initiation



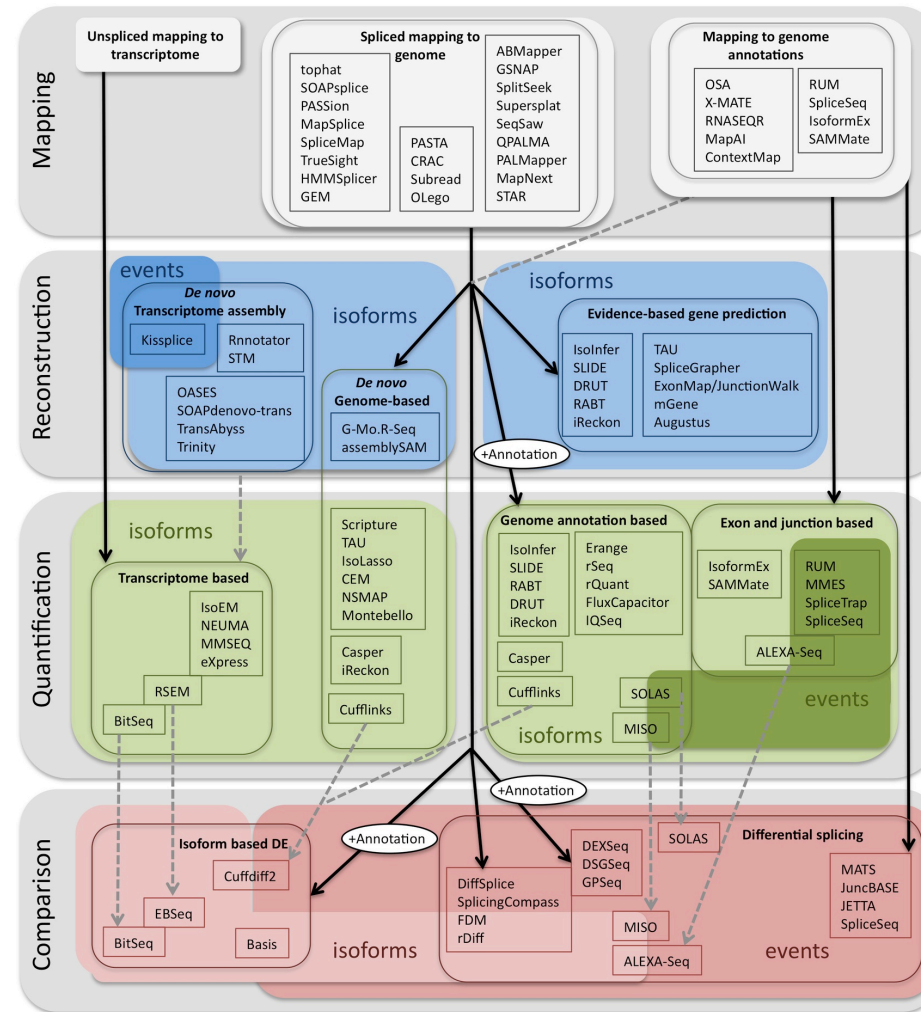
Alternative splicing



Types of alternative expression – part 2

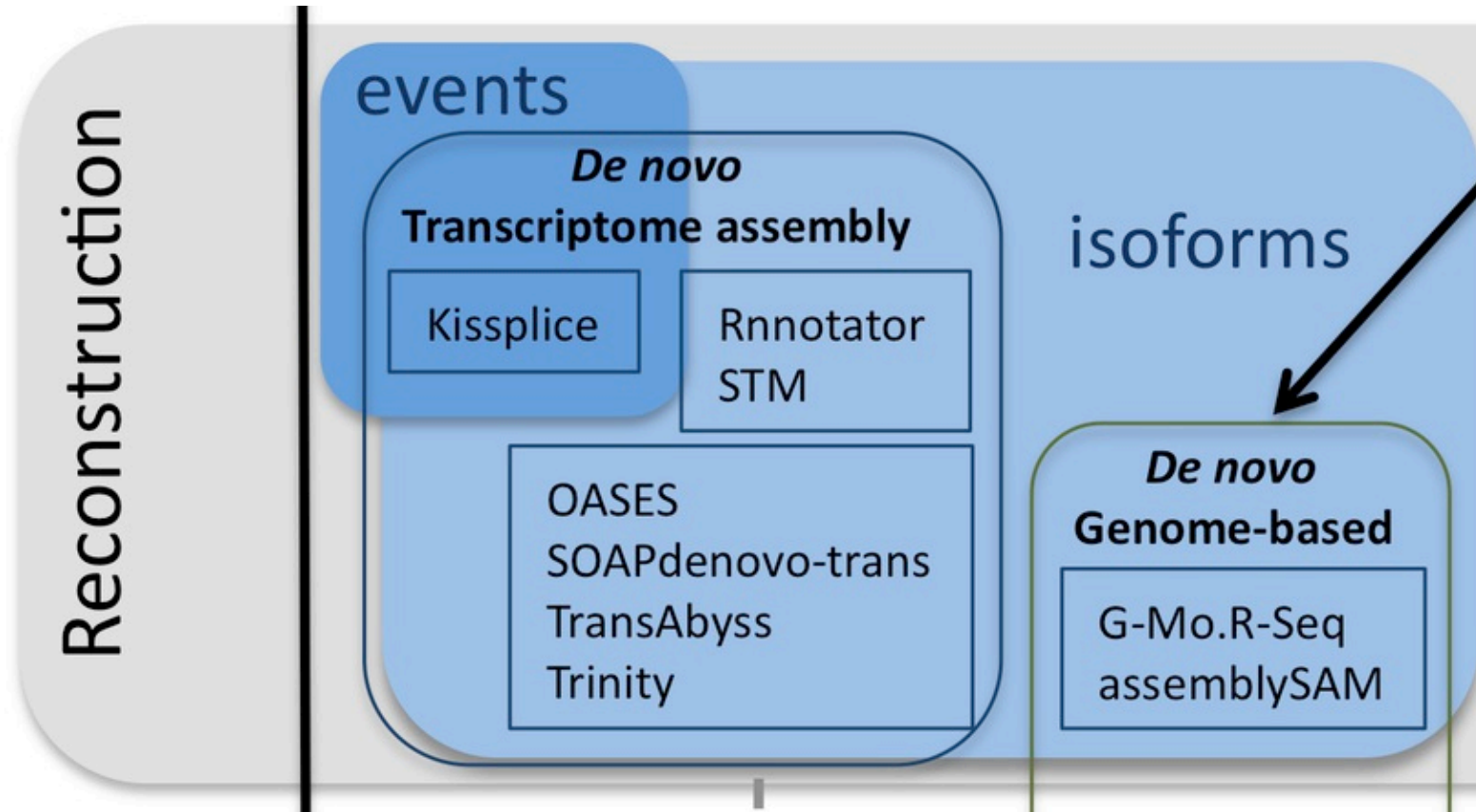


Methods to study splicing by RNA-seq



<http://www.rna-seqblog.com/data-analysis/splicing-junction/methods-to-study-splicing-from-rna-seq/>
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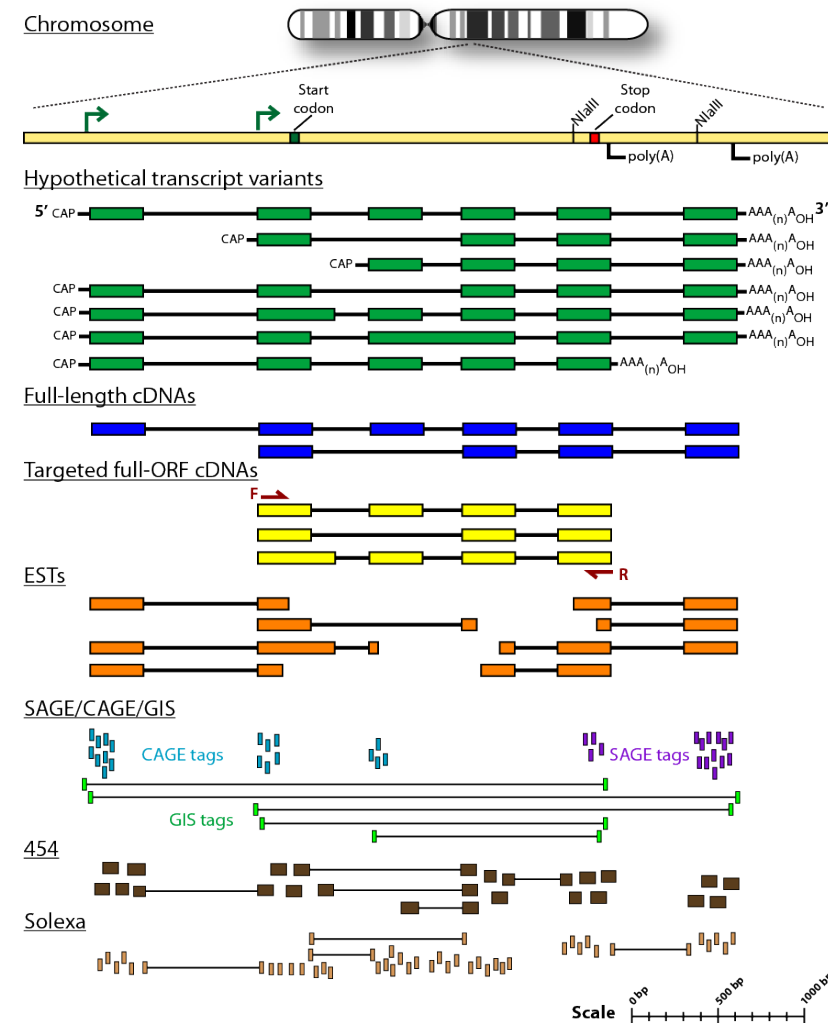


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Useful resources and discussion

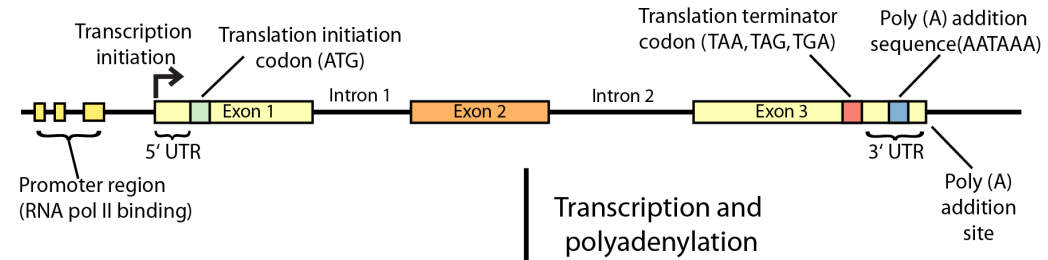
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- Identifying genes that express different isoforms in cancer vs normal RNA-seq data
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- Cufflinks / Cuffdiff Output - How are tests different?
 - <http://www.biostars.org/p/13525/>
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Sequencing methods for studying alternative isoforms

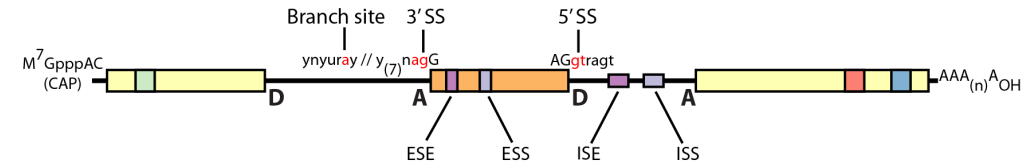


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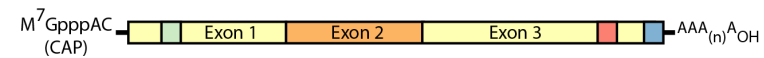


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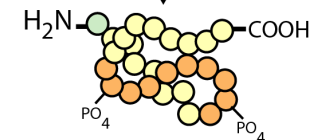


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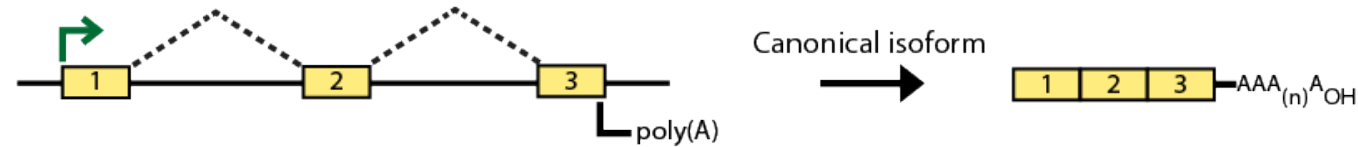


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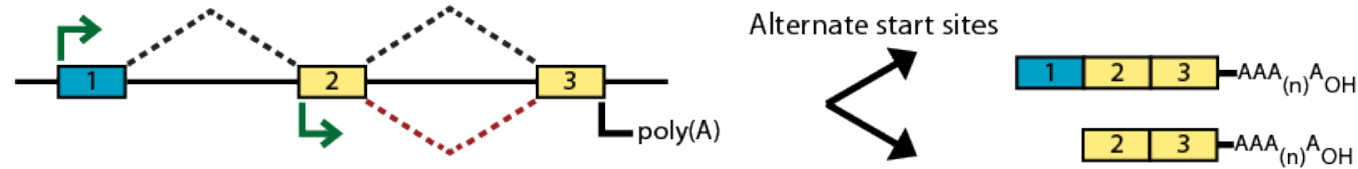


Types of alternative expression - part 1

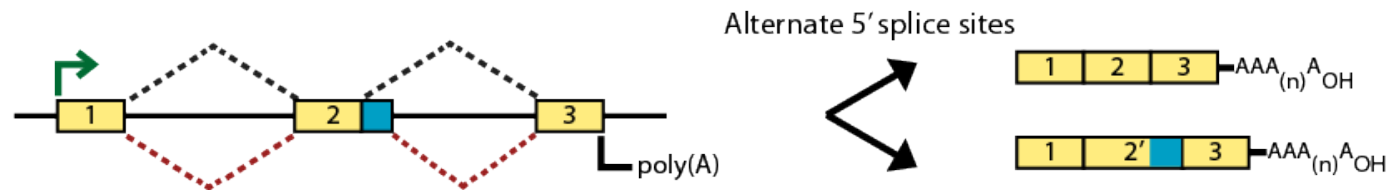
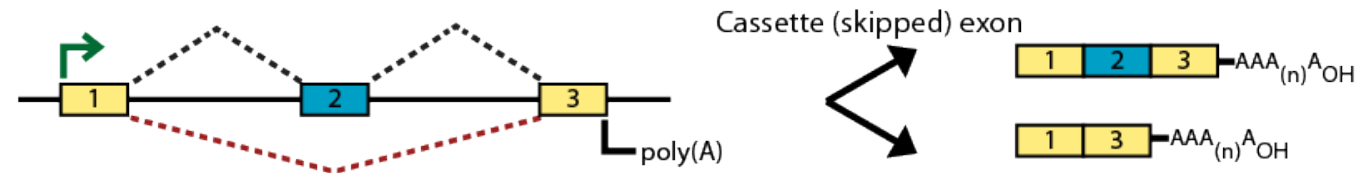
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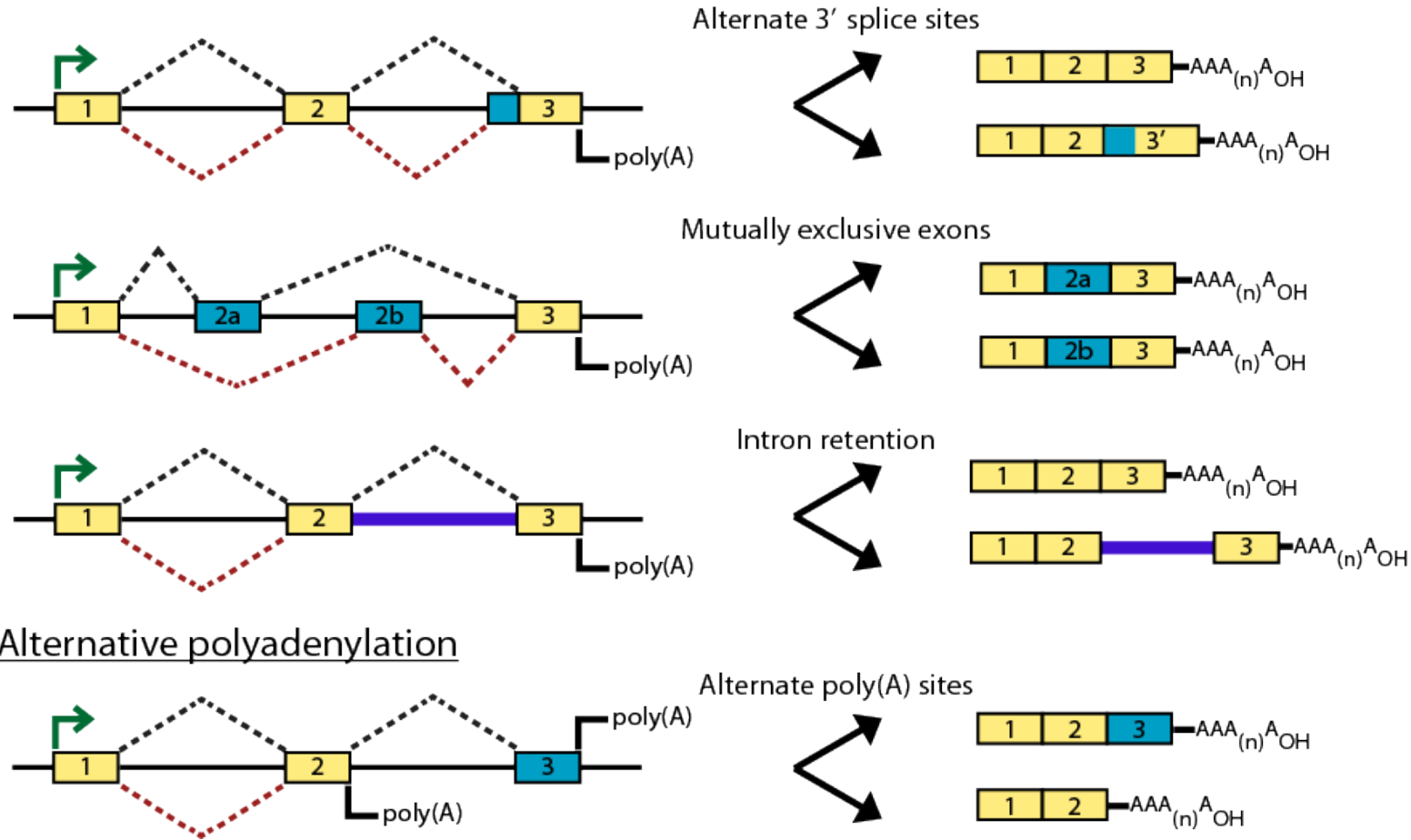
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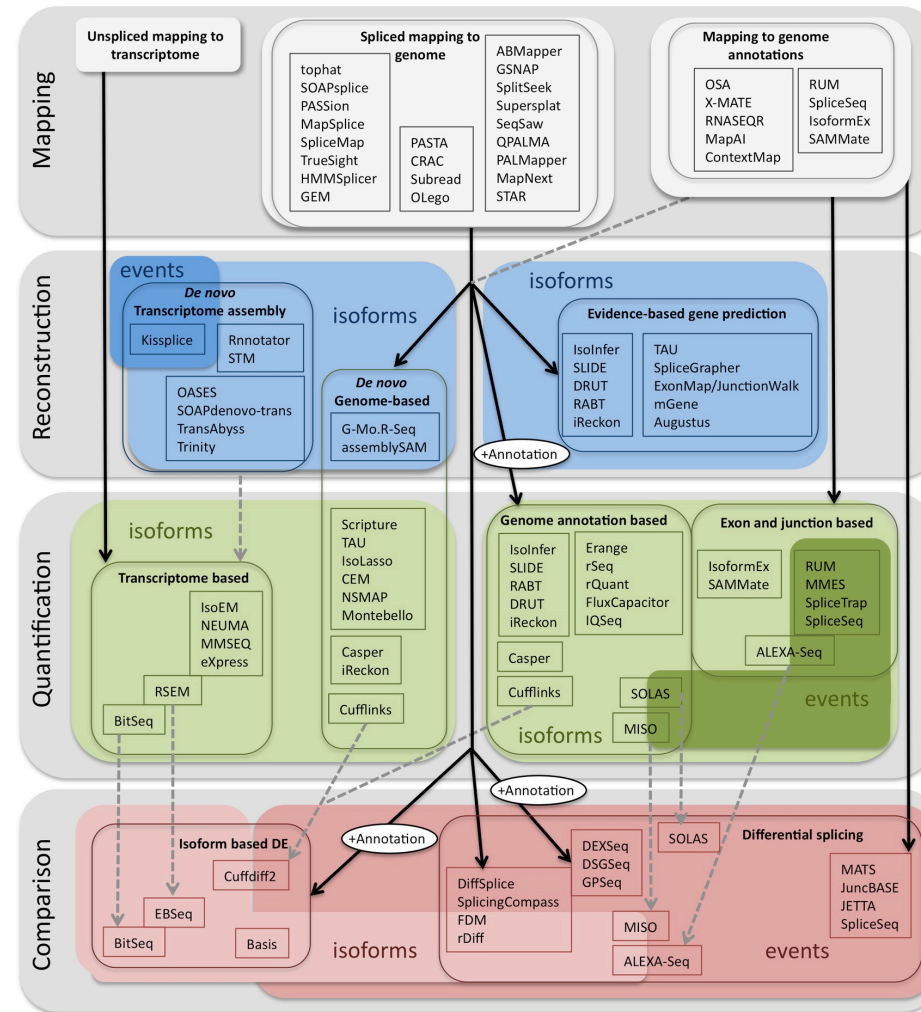
Alternative splicing



Types of alternative expression – part 2

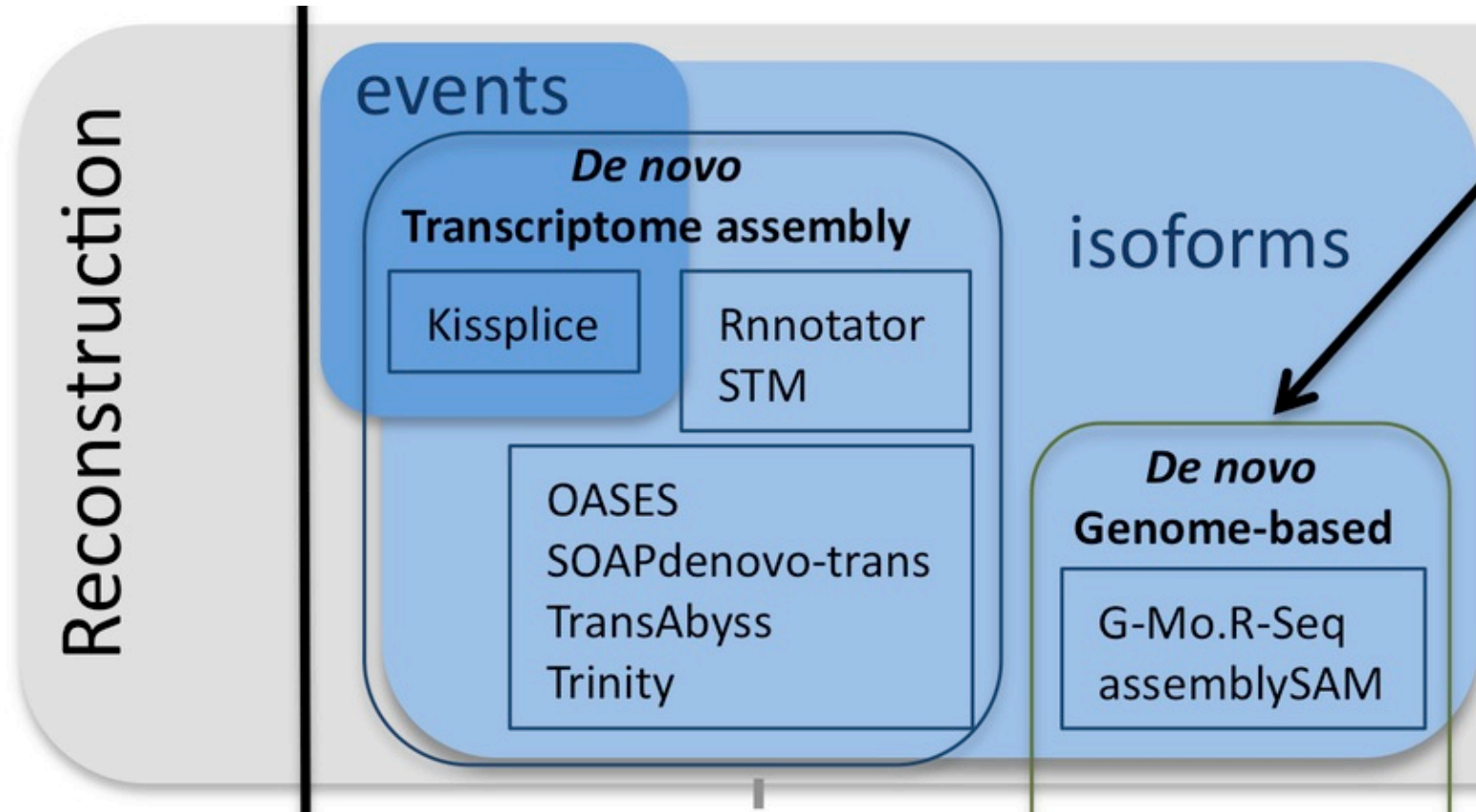


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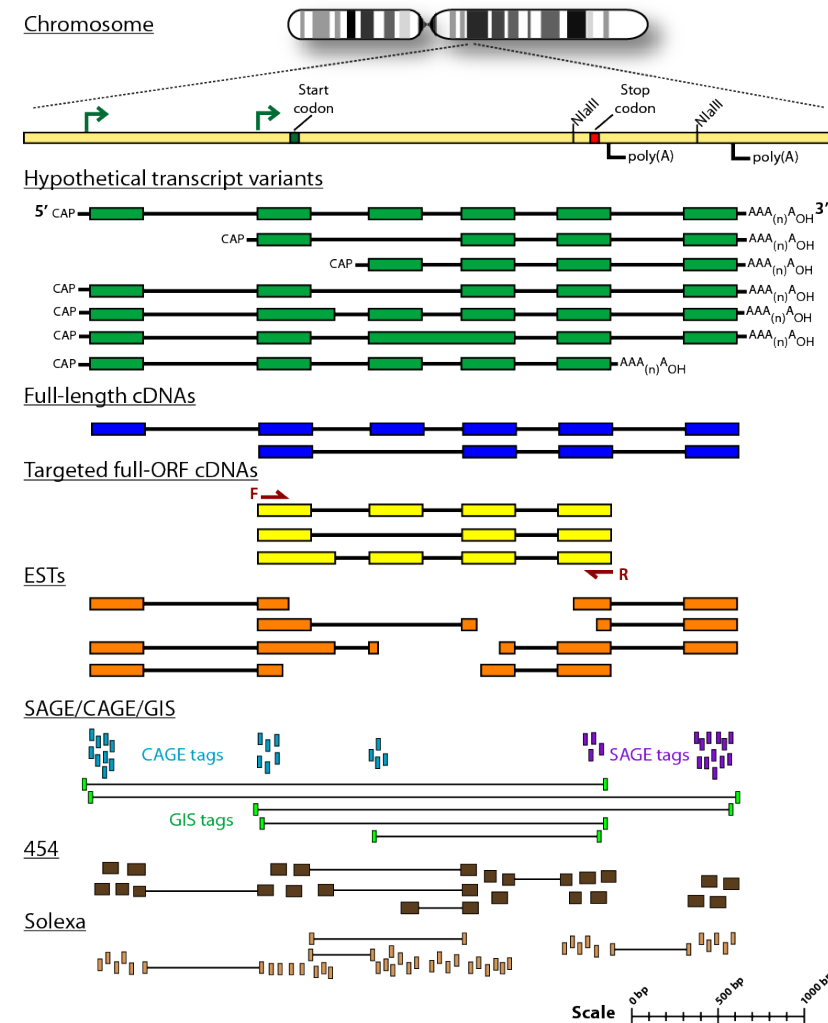


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Sequencing methods for studying alternative isoforms



We are on a Coffee Break &
Networking Session