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| Motifs,  Patterns & HMMs |  | Week 5 - Thursday  **Activity A ( de novo)**  **Activity B ( )** |
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| Overview Identification and utility of short conserved sequences as indicators of functional properties using alignment-dependent and alignment-independent methods. Learning Objectives  * Discovery and graphical representation of sequence patterns * Producing HMMs * profile:profile and profile:sequence alignments  Activity & Description (A) Invent a novel method for graphically representing a set of aligned sequences. Student groups will generate a new or use a multiple sequence alignment they generated earlier for the purpose of creating a representation of a section of the alignment that preserves as much information as possible. Activity & Description (B) Parameterizing an HMM and scoring a sequence against a profile HMM.  Using the same multiple alignment as in A, student groups will discuss and create and HMM model that accounts for all the data. Students will be given a couple of variations on a query sequence (different length, pattern repeats etc) and be asked to modify the model so that it will be useful in these situations as well. Students will calculate the probability that these and other provided sequences are members of the sequence family modeled by the HMM. Feedback & Discussion A-Have student groups present their MSA strategies and an example of output. Discuss consensus, regular expression, logo and HMM representations of multiple sequence alignments.  B-Student groups will present the HMM model and show how it can deal with outlying sequences. Volunteers will demonstrate how to calculate the probability that a query sequence belongs to the HMM. | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Logistics  |  |  |  | | --- | --- | --- | |  | A | B | | Group Size | 2-3 |  | | Group Formulation | any |  | | Group Structure | -- |  | | Seating/Computers | P&P |  | | Challenge/Room | 5 |  | | Presentation | Elmo |  |  Student Assessment  |  | | --- | |  |  Workshop Assessment  |  | | --- | |  | |   Links: |