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| Multiple Sequence Alignment |  | Week 5 - Tuesday  **Activity A (portal tool for MSA)**  **Activity B (web or desktop tool for alignment editing)** |
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| Overview Using multiple alignments to provide a more reliable assessment of similarity as well as additional information about the function of individual residues and evolutionary relationships among members of a gene family. Learning Objectives  * Create multiple alignments for 3 to many sequences * Improving alignments by manual inspection and by incorporating additional information * Representing meaning through alignment editors  Activity & Description (A) Students will use two datasets (highly similar, more divergent) to become familiar with the clustal program.  Student groups will upload a set of highly related sequences into the portal tool, conduct the analysis and study the various components in the output. In a second round, groups will repeat the analysis with a more divergent set of sequences and asked to record the questions that come up in their groups about the alignment process or about the results. Activity & Description (B) Students will move the alignment into an alignment editor and annotate it using editor capabilities.  Students groups will watch a short videotape illustrating the functionality of a alignment editor (GeneDoc?) and then utilize the editor to change labels on their sequences, focus the alignment on a highly conserved domain, add secondary structure information, and color residues in some meaningful way. Feedback & Discussion  1. Using lists of problems or questions noted by student groups during their analysis, lead a discussion centered around the problems that emerge when sequences are heterogeneous in length, too dissimilar or too similar. 2. Project one or more alignments from group volunteers. Have the class contribute to a discussion of the ways in which the alignment is informative and/or could be made more so. | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Logistics  |  |  |  | | --- | --- | --- | |  | A | B | | Group Size | 2 | 2 | | Group Formulation | Any | Any | | Group Structure | -- | -- | | Seating/Computers | 2 | 2 | | Challenge/Room | 5 | 5 | | Presentation | WB. | Proj. |  Student Assessment  |  | | --- | |  |  Workshop Assessment  |  | | --- | |  | |   Links: |