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Single-Point Mutations and Protein Structure Deviations ROY CAMPBELL, Walla Walla University — The V4 proteins, LmcA and LmcB, in the social amoeba Dictyostelium are believed to play an important role in the growth to development transition of the organism. Whether or not a normal transition occurs depends on whether one or the other or both of the proteins is expressed. The proteins only differ by one non-conserved residue. In order to understand the possible differences in protein structure and function we performed an ab initio structure calculation for each protein using the Monte Carlo fragment insertion method implemented by Rosetta. The predicted structures were found to be dramatically different. This result inspired a comprehensive survey of all the Protein Data Bank structures related by a single-point mutation. The distribution of mutations with respect to the resulting rms deviation in atomic coordinates was found to have a simple exponential behavior.

Roy Campbell
Walla Walla University

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