論文要旨

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論文題目： Development of a novel mitochondrial cleavage site predictor

キーワード： Mitochondria, Targeting Signal, Cleavage, ミトコンドリア

論文概要： A large fraction of mitochondrial proteins are cleaved upon entry into the mitochondria, but pre- diction of this cleavage is still challenging. In chapter 1, I summarize necessary background to this important problem. In chapter 2, I demonstrate that my system, Mitochondrial matrix targeting Signal Predictor, MoiraiSP, which is based on data from recent proteomic studies can correctly identified the cleavage site of MPP with more than 75% accuracy in both plant and yeast dataset. In chapter 3, I introduce sequence divergence, LD(*i*), as a novel feature for sorting signal prediction, and show that prediction can be improved by LD(*i*) than random, especially with other famous features such as physico-chemical propensities. In chapter 4, I present that MoiraiSP can treat a related problem, predicting mitochondrial matrix targeting signal by using only N-terminal sequence information such as net-charge or LD(*i*). MoiraiSP discriminates between cleaved and non-cleaved mitochondrial proteins with a success rate of 97% (plant) or 91% (yeast) by cross validation. Finally, in chapter 5, I discuss some novel candidates of protease substrates, which came up during my work.