

# 蚂蚁群落优化算法在蛋白质折叠二维亲-疏水格点模型中的应用

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氨基酸的亲疏水格点模型是研究蛋白质折叠的一种重要的简化模型，其优化问题是一个非确定型的多项式问题。采用蚂蚁群落优化算法对这一问题进行了研究，对测试数据的计算结果表明，在一定规模下，此算法能够有效地获得亲-疏水格点模型的最优解，其效率优于传统的Monte Carlo仿真等方法。

## APPLICATION OF ANT COLONY OPTIMIZATION ALGORITHM FOR 2D HYDROPHOBIC-POLAR PROTEIN FOLDING MODEL

Protein folding problem is one of the most prominent problems in bioinformatics, and hydrophobic-polar model (HP model) is a wide abstractional model in study of this problem. A new algorithm of ant colony optimization (ACO) was proposed for the HP model's optimal problem, which was a non-deterministic polynomial problem (NP-hard problem). Two novel operations, clone and elimination, were added into the normal ACO algorithm, which improved the algorithm's computational efficiency greatly. Execution for standard benchmark instances indicated that the efficiency of this new algorithm is better than that of the existent algorithms, such as Monte Carlo algorithm and genetic algorithm.

关键词