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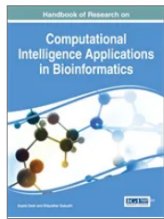
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Development of Novel Multi-Objective Based Model for Protein Structural Class Prediction

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Abstract

Protein folding has played a vital role in rational drug design, pharmacology and many other applications. The knowledge of protein structural class provides useful information towards the determination of protein structure. The exponential growth of newly discovered protein sequences by different scientific communities has made a large gap between the number of sequence-known and the number of structure-known proteins. Accurate determination of protein structural class using a suitable computational method has been a challenging problem in protein science. This chapter is based on the concept of Chou's pseudo amino acid composition feature representation method. Thus the sample of a protein is represented by a set of discrete components which incorporate both the sequence order and the length effect. On the basis of such a statistical framework a low complexity functional link artificial neural network and a complex novel hybrid model using radial basis function neural network and multi-objective algorithm based classifier are introduced to predict protein structural class.

Chapter Preview

Significance Of Protein Secondary Structure

The function of a protein is based on its structure. Knowledge of protein structure plays a significant role in molecular biology, cell biology, pharmacology and medical science. However, despite years of both experimental and theoretical study, the determination of protein structure remains one of the most difficult problems.

Protein secondary structure prediction plays a vital role due to following reasons:

1. Experimental determination of structure is not cost effective.
2. It helps in predicting the 3D structure.

Key Terms in this Chapter

- Amino Acid:** Basic building block of protein molecules.
- Hydrophobicity:** Water repelling property of molecules.
- Hydrophilicity:** Water loving property of molecules.
- Amphiphilicity:** Molecules having both water loving and repelling property.
- Elitism:** Taking the best attributes of previous generation to next generation without applying any genetic operators.
- Crossover:** Genetic procedure for generation of new population.

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