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基于DNA序列混沌游戏表示的相似性分析

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Similarity Analysis Based on Chaos Game Representation of DNA Sequence

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摘要 基于DNA序列的混沌游戏表示，利用对应测度矩阵的最大特征值组成的6维向量来刻画DNA序列，并利用向量间的相关距离对11种物种的beta球蛋白基因的第1个外显子编码序列进行相似性分析，所得结果与生物学中的进化关系基本一致.

关键词: DNA序列 混沌游戏表示 测度 相关距离 相似性分析

Abstract: Based on chaos game representation of DNA sequence,the authors obtain a 6-component vector whose elements are the leading eigenvalues of corresponding measure matrices to represent the DNA sequence.The correlation distances among introduced vectors are applied to compare the similarities of the coding sequences of the first exon of beta globin gene of 11 different species.The results are basically coincident with their evolutionary relationship.

Key words: DNA sequence chaos game representation measure correlation distance similarity analysis

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[1] RANDIC M,VROCKO M,LERS N,et al.Analysis of Similarity/Dissimilarity of DNA Sequences Based on Novel 2-D Graphical Representation [J].Chem. Phys. Lett.,2003,371:202-207.

[2] LIAO Bo,WANG Tian-ming.Analysis of Similarity/Dissimilarity of DNA Sequences Based on 3-D Graphical Representation [J].Chem. Phys. Lett.,2004,388:195-200.

[3] YAO Yu-hua,NAN Xu-ying,WANG Tian-ming.Analysis of Similarity/Dissimilarity of DNA Sequences Based on a 3-D Graphical Representation [J].Chem. Phys. Lett.,2005,411:248-255.

[4] CHI Rui,DING Ke-qing.Novel 4D Numerical Representation of DNA Sequences [J].Chem. Phys. Lett.,2005,407:63-67.

[5] YAO Yu-hua,NAN Xu-ying,WANG Tian-ming.A New 2D Graphical Representation—Classification Curve and the Analysis of

Similarity/Dissimilarity of DNA Sequences [J].J. Mol. Struct. Theochem.,2006,764:101-108.

[6] WANG Jun,ZHANG Yi.Characterization and Similarity Analysis of DNA Sequences Grounded on a 2-D Graphical Representation [J].Chem. Phys. Lett.,2006,423:50-53.

[7] LIU Xiao-qing,DAI Qi,XIU Zhi-long,et al.PNN-Curve:A New 2D Graphical Representation of DNA Sequences and Its Application [J].J. Theor. Biol.,2006,243:555-561.

[8] QI Zhao-hui,QI Xiao-qin.Novel 2D Graphical Representation of DNA Sequence Based on Dual Nucleotides [J].Chem. Phys. Lett.,2007,440:139-144.

[9] 张玉森,廖波.基于3-D图形表示的DNA序列的相似性分析 [J].生物数学学报,2007,22(4):583-590.

[10] 迟锐,高随祥.DNA序列的3D图形表示 [J].中国科学院研究生院学报，2007,24(3):280-286.

[11] GUO Ying,WANG Tian-ming.A New Method to Analyze the Similarity of the DNA Sequences [J].J. of Molecular Structure:Theochem,2008,853:62-67.

[12] 赵熙强,牟敬君.基于DNA序列四位图形表示的相似性分析 [J].中国海洋大学学报，2008,38(2):340-344.

[13] JEFFREY H J.Chaos Game Representation of Gene Structure [J].Nucleic Acids Research,1990,18:2 163-2 170.

[14] YU Zu-guo,ANH V V,LAU K S.Chaos Game Representation of Protein Sequences Based on the Detailed HP Model and Their Multifractal and Correlation Analysis [J].J. Theor. Biol.,2004,226:341-348.

[1] 许绍元, **s-集的H^s-几乎处处闭集覆盖与Hausdorff测度**[J]. 吉首大学学报自然科学版, 2009, 30(6): 18-20.