Converting Genomic Protein Sequences into Music

Tech ID: 20143 / UC Case 2006-558-0

BACKGROUND

In an effort to make science appealing to a wider audience, interdisciplinary groups have combined their efforts to initiate novel approaches toward reforming the presentation and perspective of familiar scientific material. Such interdisciplinary projects stimulate ground-breaking thought that allows one to incorporate non-specialists into a particular field of study.With respect to basic science research, a conversion from genomic sequences to music could be used as a unique presentation to encourage independent and creative thought without conventional restraints that tend to compartmentalize seemingly different subjects such as the arts and sciences. Past efforts to convert genomic sequences into music have involved a 20 note scale that generates music with large jumps between two consecutive notes, sometimes referred to as Alien music.

INNOVATION

Researchers at UCLA have developed a method of converting amino acid sequences into musical notes in a way that avoids the awkward sounds resulting from a simple 20 note scale in which each amino acid is assigned to one of 20 notes. This new method involves a reduced 13 note scale based on hydrophobicity and pairing of like amino acids, and using three-note chords to differentiate between members of amino acid pairs. Rhythm was added according to the codon distribution used in the genome-encoded protein sequence, allowing each amino acid to be represented by different note durations. The resulting music based completely on the actual protein sequence provides a new piece of music that is easy to listen to and retain.

APPLICATIONS

With respect to basic science research, a conversion from genomic sequence to music would open a door for the blind to understand the intricacies of patterns in genomic storage information that they would otherwise not be able to study or contextualize. An auditory presentation could also be used as a means to expose students to the concepts of DNA sequences and protein sequences at an earlier age through the auditory differences and similarities in complexity, length, tempo, and loudness of melodies pertaining to various sequences. In such a way, students could pursue their interest in basic biology at an earlier age before entering high school. The unique presentation would also encourage independent and creative thought without conventional restraints that tend to compartmentalize seemingly different subjects such as art and science.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

KEYWORDS

research tools

CATEGORIZED AS

- **Research Tools**
  - Bioinformatics
  - Other

RELATED CASES

2006-558-0

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