Vaccines and the Thermophilic Gene

Jella, Satya

To help vaccinate the rural population of Africa, who do not have easy access to electricity and refrigeration, the thermophilic gene could be added to common vaccines to help them remain potent. For this project, genomes of both mesophiles and thermophiles (ambient temperature and heat- loving, respectively) were analyzed. First, three thermophilic genomes were compared. The goal of this comparison was to find the longest common substring in all genomes, which would represent the thermophilic gene. To make sure that this sequence is coding for thermophilic qualities, rather than replication or shape etc, the genomes of one archaea and one bacteria were used. After this comparison, the resultant sequence was searched for in 3 mesophilic genomes that commonly affect humans. Since the string was not present in any of these three genomes, it was concluded that this string is a strong candidate to be the key identifier of the thermophilic gene. The resultant string was AAATGGCCG. The next step in this experiment is to use DNA splicing to insert the gene to disease causing mesophiles, which can then be weakened. The resultant vaccines will be heat-resistant, and able to survive the trip from metropolitan areas to rural Africa. This can help improve the standards of living and life expectancies in these regions.

Awards Won: