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Abstract:

Transfection “Junk” DNA – A link to the Pathogenesis of Alzheimer’s disease?

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None

Abstract:

A transfection product incorporates in one molecule of human DNA , an inserted segment of DNA from another species. This communication addresses the hypothesis that a novel variation of the theme of transfection, namely “junk transfection” for which no protein product and no RNA is transcribed, might offer insights into the pathogenesis of Alzheimer’s disease. It is hypothesized that spirochetal DNA gains access to the intracellular compartment of nerve cells during the subclinical latency phase of neuroborreliosis and chemically combines with human DNA. A previously reported Molecular interrogation of Alzheimer’s disease autopsy tissues has yielded novel DNA sequences containing the 11 q human chromosome and a short piece of the *Borrelia burgdorferi* Flagellin B DNA. Although the usually encountered transfection product bundles an entire nonhuman gene within it, this model proposes that shorter inserts into the human genome constitute “junk transfection” because no protein is derived from them. Junk transfections would offer an important new cognitive model for the detection of occult infections as the root causes for the Tauopathies, which are degenerative neurological disorders, including Alzheimer’s disease.

Introduction:

Transfection is the human subset of Lateral Transfer of DNA. Horizontal (or Lateral) DNA transfers occur in many prokaryotic to eukaryotic cell systems, and may be transient or permanent events in the life of the organism.(1.)

Lateral DNA transfer is epitomized by the transfection events in human retroviral infections (HIV/AIDS).(2.) Bacterial to human transfection has been benchmarked in the *Agrobacterium tumefaciens* to HeLa tissue culture model of Citovsky and colleagues. (3.) Structural similarities of the vector plasmid of *A. tumefaciens* with the linear plasmids of *Borrelia burgdorferi* offer a conceptual bridge to allow for consideration of *Borrelia* to human transfection to occur.(4.)

Hypothesis/theory:

Transfection of the ordinary type in controlled circumstances in the research laboratory is facilitated by commercially available kits. Various methods (viral vectors, electroporation, chemical catalysts) intrude foreign DNA into the human cytoplasmic/nuclear compartment. Chemical linkage of human DNA with the non human DNA may occur as random events , or , with the participation of specific restriction endonucleases, may show a site specific integration within the human genome.

A molecular interrogation of Alzheimer's disease brain tissues was undertaken based on the model of primate experimental neuroborreliosis, using the polymerase chain reaction method. Flagellin B transcriptome sites were designed for the nested primer oligonucleotides, based on the success of these molecular probes in the primate model. Seven of ten Alzheimer's disease cases produced sharp bands of the intended target size of 500 base pairs. Nucleotide sequences analysis demonstrated a fusion of Borrelia flagellin B DNA with a short piece of human Chromosome 11q. In a supercomputer search of all known DNA sequences, matches were identified for human chromosome 11q (241 out of 137 million bases for chromosome 11) and Borrelia flagellin DNA (22 out of 1011 bases). These seven novel sequences are now deposited in the national Gene Banks for the USA, Europe, and Japan.(Sequences identifiers = gi 73427170, gi75914674 to gi 75914679) BLASTn searches disclose remarkable structural homologies in this group of seven (RID:1131018016-21957-186797320278.BLASTQ3) , for which the term "Junk Transfection" is proposed. It is hoped that these novel sequences will eventually be useful as a molecular signature for Alzheimer's disease.

Evaluation of the Hypothesis:

A larger scale study with the identical experimental methodology is needed to corroborate the detection of “junk transfection” DNA . There are no previous publications known to exist for which no measurable product occurs following the insertion of foreign DNA to produce a Transfection product . If “silent transfection” is occurring in the laboratory, or in nature, then only DNA sequence analysis will verify it. It is hoped by way of predictive speculation, that the “Junk transfection” DNA will find a niche in molecular biology lexicons and and practice. Many examples exist in nature for “noncultivable” microbes, which are so fastidious that they refuse to grow in liquid culture media in the microbiology laboratory. *Treponema pallidum*, the spirochetal agent of syphilis will not grow in the microbiology laboratory. By analogy, the ‘Junk transfection DNA’ concept is a model to establish a conceptual link between a pathogenic microbe in diseased tissue, which is recalcitrant of in vitro culture attempts and is also “inert” in the usual transfection scenario, in which DNA via RNA produces a measurable protein product in the transfected cells.

Word Count = 826 words

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