

Horizontaler Gentransfer

Bei Prokaryonten (Bakterien und Archäen) ist der horizontale Gentransfer die Regel, sozusagen das Tagesgeschäft.

Bei Eukaryonten (den zellkernhaltigen Lebewesen; Pflanzen, Tieren, Pilzen) ist der horizontale Gentransfer in der Regel nur unter erschwerten Bedingungen (z.B. Genbeschuss) möglich. Die dadurch entstandenen Chimären sind in der Regel weniger stabil. Sie sind weniger lebensfähig als das Original. Mehrere Ausnahmen aber sind bekannt: der horizontale Gentransfer bei Fadenwürmern, bei Tauflieden und bei einer Art von Rädertieren. Im Medizinbetrieb werden entsprechende Ereignisse umschrieben mit: Memory Zellen, Autoimmun-Krankheiten, Tumore und Krebsstammzellen.

Makroskopisch führt ein horizontaler Gentransfer bei Eukaryonten in der Regel zu einer Störung des Zusammenhalts, zu Kohärenz-Problemen, zu Entzündungsreaktionen, zu Krankheit und zur Aktivierung von Reparaturmechanismen, im günstigsten Fall zu einem neuen Gleichgewicht (einer neuen Insel der Ruhe), zu Veränderungen im physischen und psychischen Gleichgewicht, im günstigsten Fall z.B. in dem erhofften Effekt bei aktiven Impfungen zu einer neuen Immunitätslage.

Einer der zahlreichen Ordnungsmechanismen ist der Methylzyklus. Der Methylzyklus schaltet Fremd-Gene stumm.

In prokaryotes (bacteria and archaea) horizontal gene transfer is the rule, so to speak, the daily business.

In eukaryotes (the nucleated beings; plants, animals, fungi) horizontal gene transfer regularly is possible usually under difficult conditions only (e.g. gene-bombardment). The resulting chimeras are in generally less stable. They are less viable than their original. At least three suspected exceptions are still known: the horizontal gene transfer in nematodes, fruit flies and in a species of rotifers. Medically such events are denoted by the following transcriptions: memory cells, autoimmune diseases, tumors, cancer stem cells.

Macroscopically, horizontal gene transfer usually leads in eukaryotes to a disruption of cohesion, coherence problems, inflammatory reactions, resulting to disease and activation of repair mechanisms and, at best, to a new equilibrium („island of calm”) with changes in the physical and mental behaviors, to immunity, for example in an active vaccination to the hoped immunization.

One of the numerous mechanisms of discipline is the methyl cycle. The methyl cycle switches foreign genes silent.

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degraded DNA may be a previous unrecognized driver of bacterial evolution with implications for evolutionary theory.”

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„It seems that the entire history of life is an incessant game of tug-of-war between such mobile genetic elements (MGEs) and their cellular hosts. MGEs pervade the biosphere. In all studied habitats, from the oceans to soil to the human intestine, the number of detectable virus particles, primarily bacteriophages,

exceeds the number of cells at least tenfold, and maybe much more. Furthermore, MGEs and their remnants constitute large portions of many organisms' genomes—as much as two-thirds of the human genome and up to 90 percent in plants such as corn ».

Crisp A et al. (2015) **Expression of multiple horizontally acquired genes is a hallmark of both vertebrate and invertebrate genomes.** doi:10.1186/s13059-015-0607-3, Genome Biology. 16, 50 <http://genomebiology.com/2015/16/1/50>

„We argue that HGT has occurred, and continues to occur, on a previously unsuspected scale in metazoans and is likely to have contributed to biochemical diversification during animal evolution.“

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