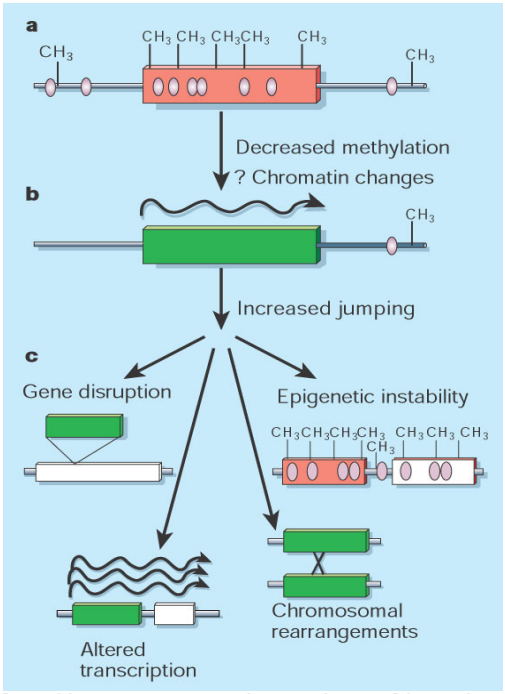
Master Project:

What happens with the jumping genes?

Studying the role of the L1 retrotransposon in brain development and function.



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Background: The L1 (long interspersed nuclear element 1) is a mobile genetic element within mammalian cells. L1 elements are retrotransposons that are the most widespread class of transposons in mammals and constitute almost ≈20% of mammalian genomic DNA content. Most of the L1 sequences in the genome are retrotransposition incompetent. Only ≈150 full-length L1 elements in the human genome and ≈3000 in the mouse genome are potentially mobile.
It is known that L1 elements are highly active in brain tissue. The activity of L1 retrotransposition during brain development can have an impact on gene expression and neuronal function, thereby increasing brain-specific genetic mosaicism. It is also known that the L1 retrotransposition is involved in the development of the neuronal diversity.

Rationale: We have a novel L1 transgenic mouse model, in which we now can investigate the effects of L1 retrotransposition in the brain.
The following questions will be addressed:

- Which brain regions and cell types support L1 retrotransposition?
- Does L1 retrotransposition take place in certain brain regions and in specific cell types?
- What happens with L1 retrotransposition during brain development?
- Does L1 retrotransposition lead to characteristic phenotypes?
- Do these characteristic phenotypes occur during brain development or later in life?

Methodological approach and work plan: The project combines different methodologies, including behavioural analyses (tests for learning and memory formation, emotionality) to investigate the effect of L1 retrotransposition on cognitive and emotional functions. Immunocytochemical analyses combined with confocal laser microscopy will give insights about the the mechanism of the L1 retrotransposition in the brain.

For further information and application please contact

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