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Retrotransposon-derived genes in mammalian development and evolution

Retrotransposons have been long thought as selfish DNAs, therefore, useless and harmful existence in our genomes. However, in evolutionary time scale, they might have played an important role in establishment of mammals. Recently we have demonstrated that two retrotransposon-derived genes, *Peg10* and *Peg11/Rtl1,* play essential roles in formation and maintenance of placenta, an essential organ for viviparity in mammals. Importantly, they are mammalian-specific genes, not present in non-mammalian vertebrate species. These facts strongly suggest that domestication of retrotransposons have huge impact on mammalian evolution via acquisition of viviparity and placentation. They are very good examples of the Darwinian theory of evolution, positively selected genes because of their developmental advantages. I would like to also discuss on the relationship between two major evolutionary mechanisms, neutral evolution, originally proposed by Motoo Kimura, and the Darwinian evolution by natural selection.

References

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CV

1983 – 1991	Assistant Professor, Institute for Applied Microbiology, The University of Tokyo.
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