Preface

Retrotransposable elements are mobile DNA sequences that can – among others – disrupt genes, induce the formation of diverse genomic rearrangements, influence gene expression and mobilize and duplicate various other types of sequences. They represent major components of eukaryotic genomes and make up at least 40% of human DNA. The genomic status of retrotransposable elements is still controversial and the object of intense debate in the scientific community. On the one hand, retrotransposable elements are frequently considered as genome parasites or even as “junk DNA”. Occasionally, they can cause genetic diseases or evolve as retroviruses. On the other hand, the contributions to this special issue demonstrate that retroelements and retrotransposition are without any doubt driving forces of gene and genome evolution. For example, an important proportion of regulatory and coding sequences contain parts of transposable elements that are required for proper expression and function of resident genes and proteins. Some retrotransposon sequences have been domesticated by the host and now play important roles in DNA replication, immunity and other important processes.

Research on mobile DNA is a fast-moving science. This is particularly due to the exponentially increasing amount of genomic data generated by multiple sequencing projects. The large collection of articles in this special issue of *Cytogenetic and Genome Research* perfectly reflects the most recent progress in understanding how retrotransposable elements transpose and evolve, and how they influence genome structure and gene function in living organisms. I am convinced that we are still only looking at the tip of the evolutionary iceberg, and that future studies will reveal major surprises concerning the role of transposable elements in the evolution of life.

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