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# An ultra-conserved retrovirus produces a new class of small RNA and defines genetic and epigenetic components of the vertebrate centromere

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Little is known about the function of centromere satellite RNAs in vertebrate cells or the elements controlling their transcription. Nonetheless, evidence suggests that they play a role in centromere identity and in the recruitment of kinetochore proteins. Our investigation of centromeres of vertebrate species spanning over 300 million years of evolution, encompassing mammals and birds, has uncovered a previously unidentified conserved sequence element, a retrovirus. We have determined that this novel retrovirus is composed of ultra-conserved sequence elements, that it is transcribed bi-directionally and produces small non-coding RNAs of a novel class size. Deep sequencing of these small RNAs shows that they are enriched for this retroviral sequence and their contiguous genomic neighbors within the centromere. Targeted disruption of the processing of these small RNAs results in severe cell division defects. Taken together, these data indicate that this virus plays an apparently domesticated role in centromere function and cytokinesis.