# Regulation of transposable elements in the absence of piRNAs in a clade IV nematode during a parasitic infection

Small RNAs (sRNAs) are short non-coding RNAs that regulate more than 30% of gene expression associated with chromatin structure, mRNA translation and transposable element activity via post-transcriptional gene silencing. Although sRNAs were first discovered in the free-living nematode *Caenorhabditis elegans*, little is known about their role in parasitic nematodes. The gastrointestinal parasitic nematode *Strongyloides*, like most other nematode species outside of clade V, have lost the PIWI pathway involved in piRNA production and suppression of transposable element activity. Here, we investigated the role of endogenous sRNAs in the gastrointestinal parasitic nematode *Strongyloides ratti* and compared sRNAs expressed in genetically identical adult parasitic and free-living life cycle stages. We identified two different classes of small-interfering RNAs (siRNAs); a class of 21-22 nucleotide-long siRNAs with a 5' uracil (21-22Us) and a 5' monophosphate modification, as well as a class of 27 nucleotide-long siRNAs with either guanine or adenine at the 5' end (27GAs), and a polyphosphate 5' modification. We found that unlike the 27GAs that were associated with both the parasitic and free-living stages, 21-22Us were specifically expressed in the parasitic stage. Both 21-22Us and 27GAs were largely targeting a diverse set of transposable element sequences within the X-chromosome. Our results suggest that distinct classes of sRNAs are associated with parasitism or features associated with the parasitic life cycle and that these sRNAs are involved in regulating the activity of transposable elements.