

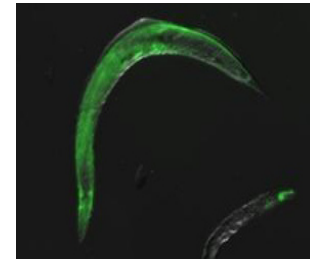
Virus discovery by assembly of virus-derived small silencing RNAs

Qingfa Wu Ph.D

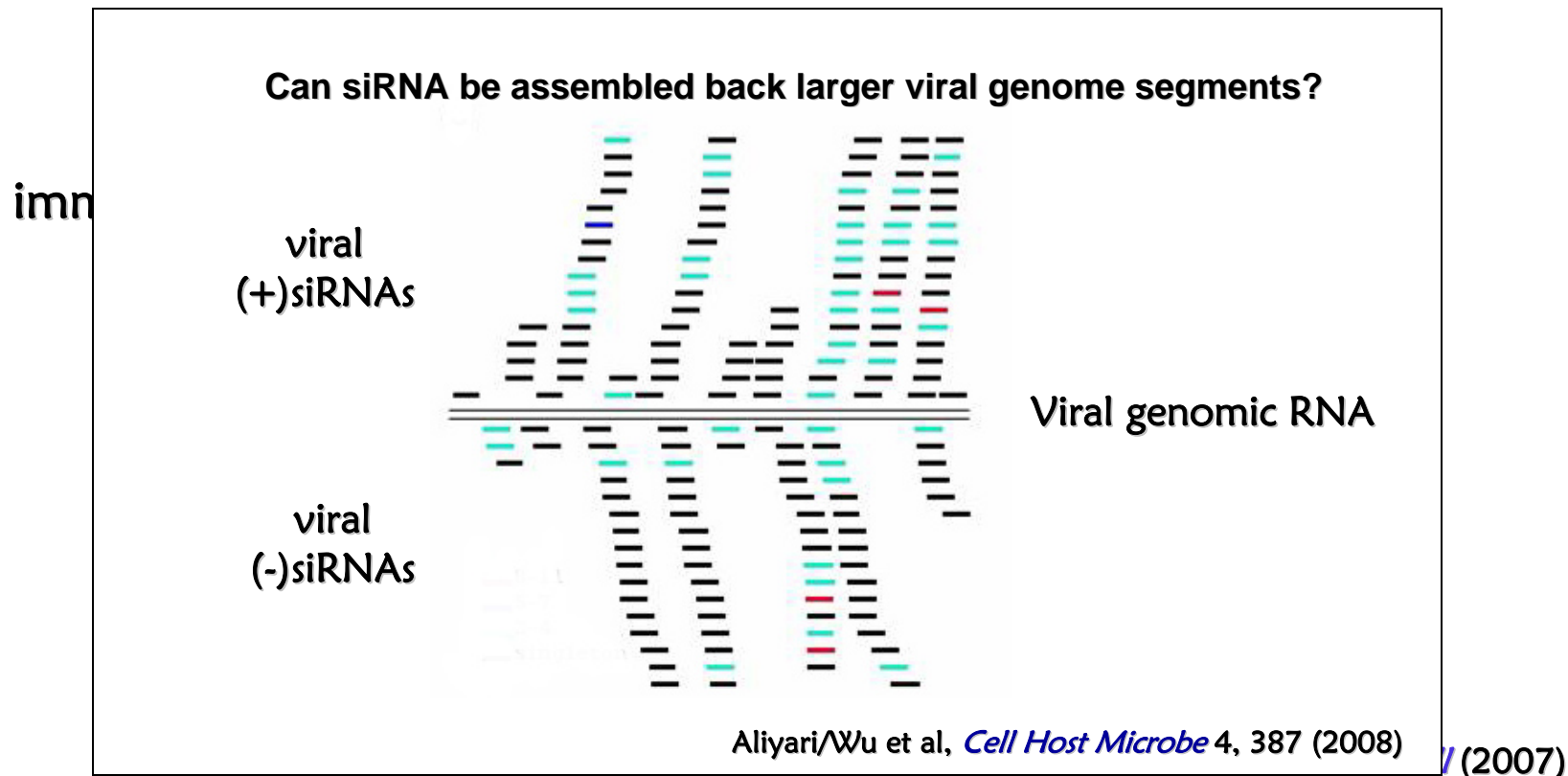
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RNA silencing - A natural immune response against viruses in plants, insects & nematodes



RNA/DNA viruses

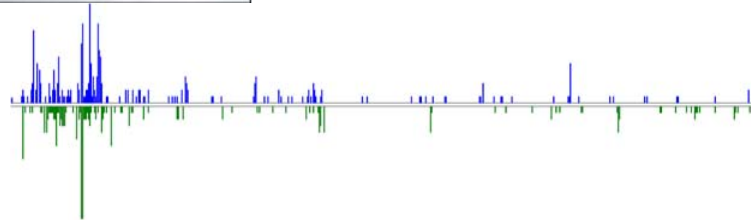


Assembly of virus-derived siRNAs from acute infection hosts



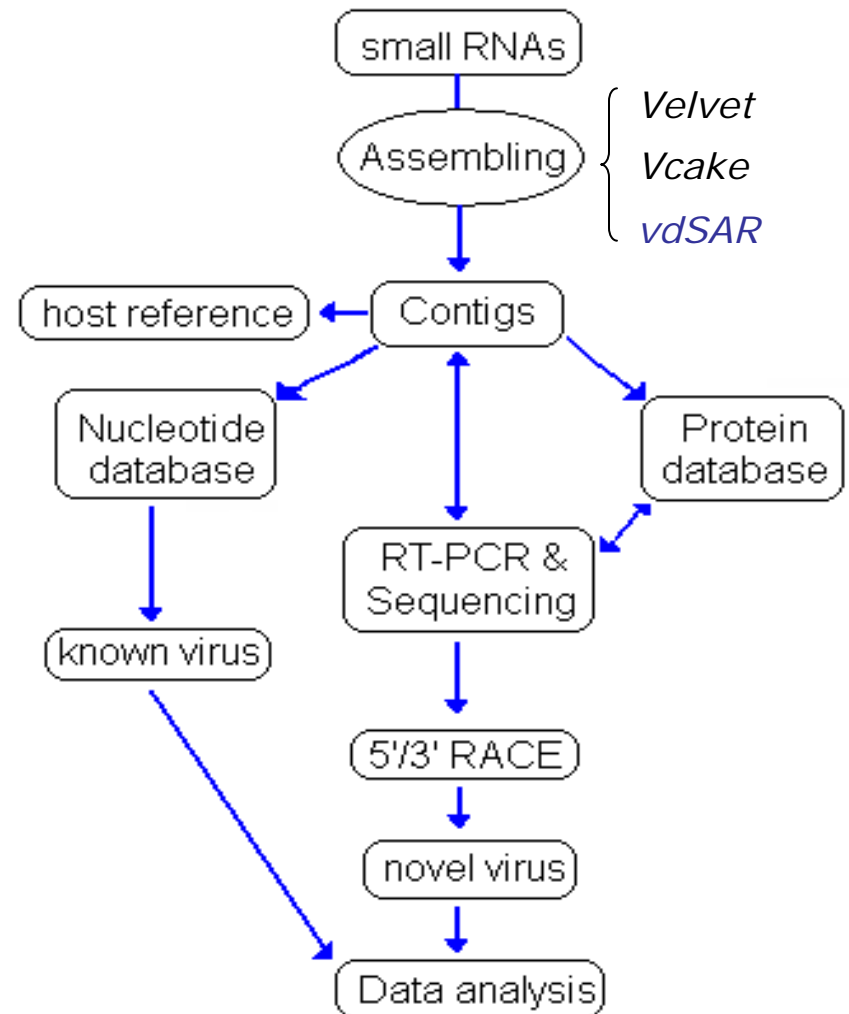
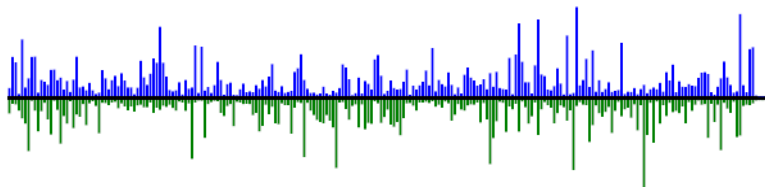
Flock House Virus (FHV)

4,371 reads



Sindbis virus

3,771,297 reads



Discovery of viruses from persistent infection *Drosophila* S2 cells

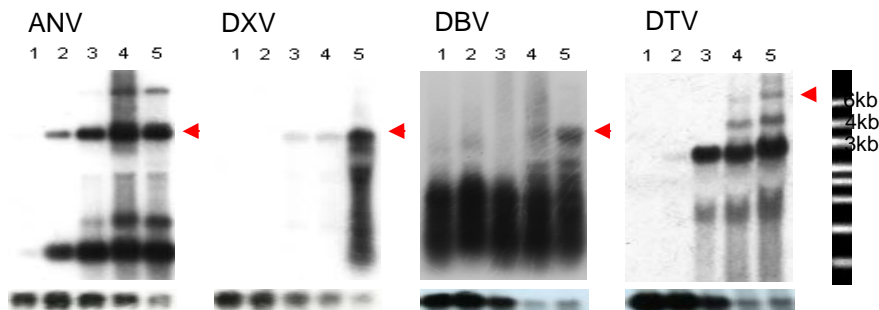
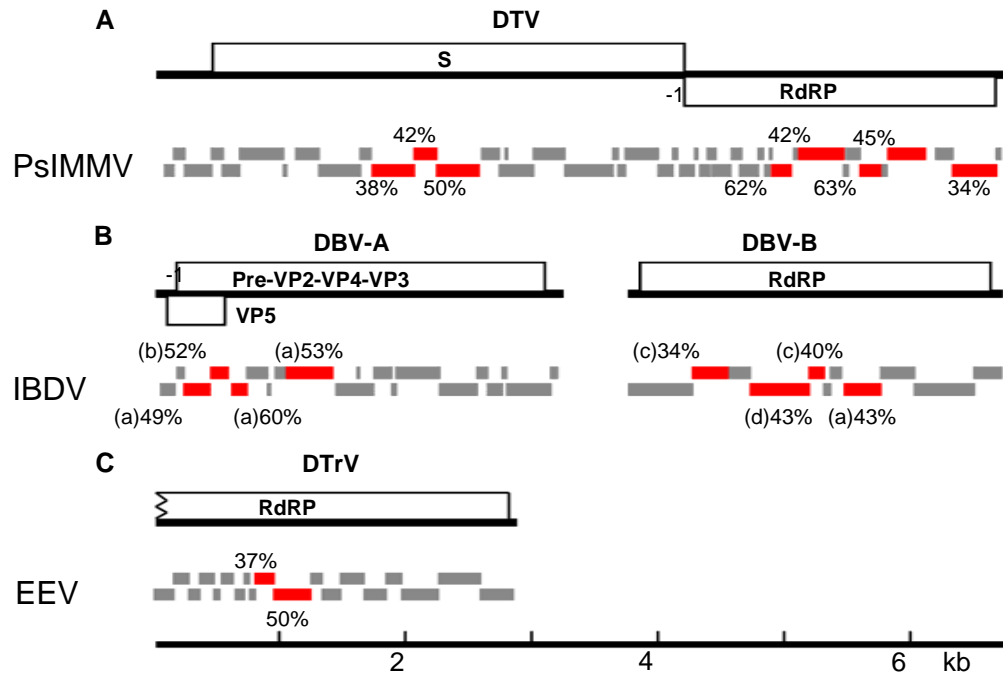
6,454,759 reads => 1639 contigs

Velvet, *k-mer*: 17

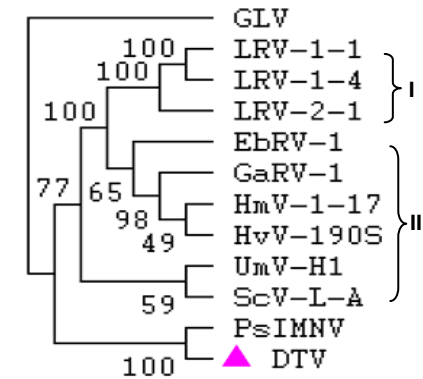
1032 contigs => host genome

57 contigs => DXV

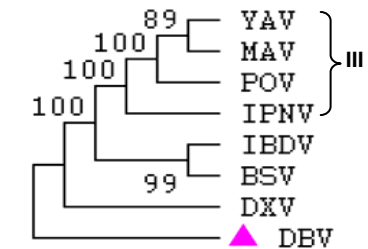
49 contigs => ANV



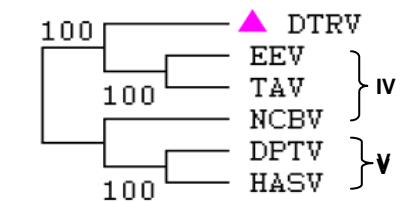
A



B

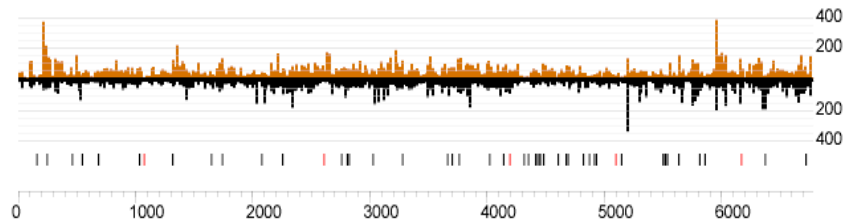


C

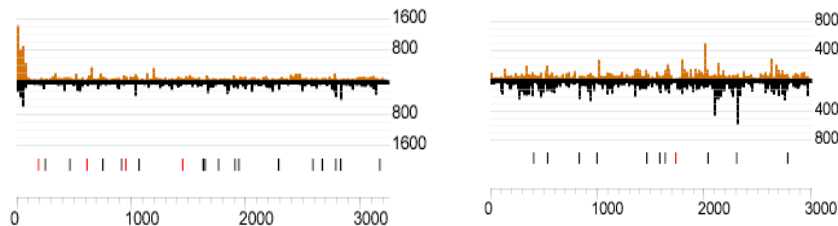


Profiles of viral siRNAs of viruses identified in *Drosophila* S2 cells

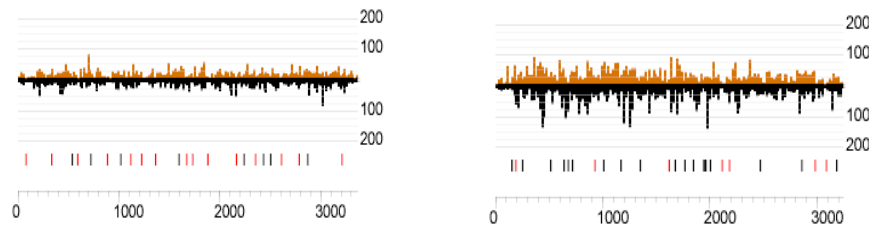
DTV
18%



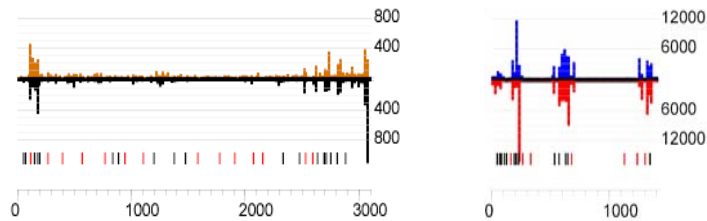
DBV
17%



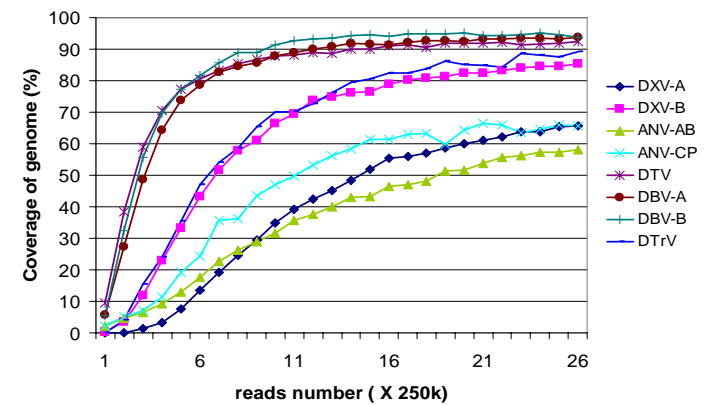
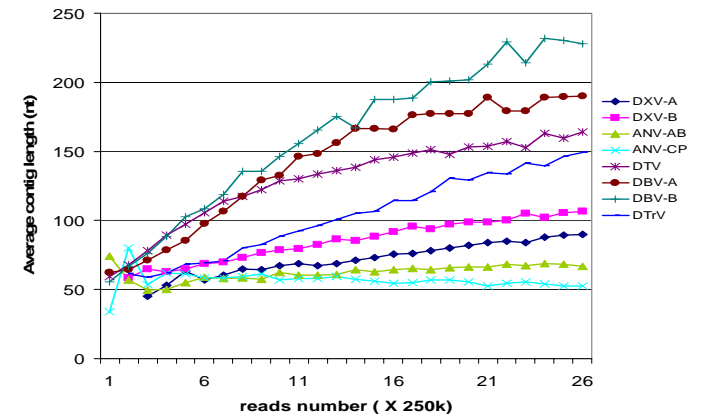
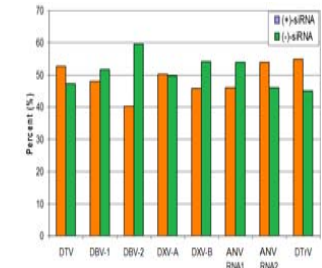
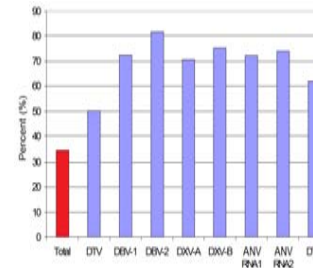
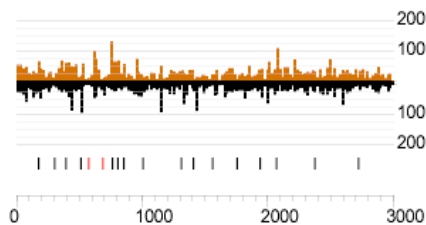
DXV
5.7%



ANV
56%



DTrV
3.4%



Virus discovery by deep sequencing & assembly of viral siRNAs produced by the host immune system

- **Requires no prior enrichment/purification**
- **Identifies all viruses in one sequencing run**
- **Detects live, replicating viruses**
- **The unique features of small RNAs profiles can be used to develop bioinformatics tools**

Acknowledgement

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