

# GDCB SEMINAR

Tuesday, March 22, 2022 — 4:10 p.m.

1414 Molecular Biology Building

## 'RNA-directed DNA Methylation: a maternal influence during seed development'

**Abstract:** 24-nt small interfering (si)RNAs establish DNA methylation at thousands of genomic loci in a process called RNA-directed DNA Methylation (RdDM). RdDM is dispensable for growth and development in Arabidopsis, but is required for reproduction in many other plant species. For example, in *Brassica rapa*, development of the embryo and endosperm aborts if RdDM is disrupted in the maternal sporophyte, implying communication between maternal and filial tissues. During reproduction, 24-nt siRNAs are particularly abundant in maternal sporophytic tissue such as the seed coat, largely due to overwhelming expression from a small number of "siren" loci. Siren loci account for over 90% of siRNAs in ovules and early seeds, and many siRNAs are produced from gene fragments embedded in these loci. We have recently shown that these siRNAs trigger methylation at homologous protein-coding genes, and in some cases this trans-methylation impacts expression of the target gene. In the endosperm, siren siRNAs are maternally biased, suggesting that siRNAs might be transported to, and function in, filial tissues. Together, these observations suggest that maternally-derived siren siRNAs might methylate protein-coding genes in filial tissues to influence seed development

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