

Uncovering the sex determining locus in diatom *Seminavis robusta*

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The life cycle of most diatoms involves a cell size reduction during mitotic cell divisions and cell size restoration through sexual reproduction. Vegetative diploid diatom cells divide mitotically and due to the constraints of their silica cell walls, one of the daughter cells is smaller than the mother cell during each mitotic cell division. As a result, the average size of a proliferating diatom population decreases. Cell size restoration typically occurs through sexual reproduction. The capability to enter into generative reproduction is strictly size-dependent: only cells under a particular size threshold can become sexualized.

In our work, we focus on the elucidation of the mechanisms underlying sex determination and the regulation of sexual reproduction in the pennate diatom *Seminavis robusta*. The life cycle of this specie displays characteristics typical for pennate diatoms: size reduction during mitotic cell divisions, strict dependence of sexual reproduction capability on cell size and the presence of two mating types (heterothallism). An advantage of using *S. robusta* for sexual studies in diatoms is that under laboratory conditions, cells below the sexual size threshold can be easily induced to sexual reproduction.

Recently, the *S. robusta* mating type locus (MTL) was identified using an AFLP-based sex specific linkage map [1]. It was determined that the MTL segregates as a single locus, with MT+ being the heterogametic sex and MT- the homogametic sex.

We are using a combination of sequence analysis of the *S. robusta* draft genome and the PCR-based genome walking technique to obtain the sequence of the MTL. Preliminary data suggest that the MTL of *S. robusta* spans several tens of kilobases and that repetitive sequences tend to accumulate on the sex determining allele specific for MT+. At the congress, I will present our latest progress on the characterization of the *S. robusta* mating locus and further steps planned for the identification and characterization of genes involved in mating type determination.

References:

[1] Vanstechelma, I., Sabbe, K., Vyverman, W., Vanormelingen, P., and Vuylsteke, M. (2013). Linkage mapping identifies the sex determining region as a single locus in the Pennate diatom *Seminavis robusta*. *PLoS one* 8, e60132.