

## Faculti Summary

<https://faculti.net/plasticity-and-microevolution-of-diatoms/>

This video discusses the significance of diatoms, which are single-celled, photosynthetic organisms found in the ocean. Diatoms play a crucial role in the planet's ecology by producing about 20% of Earth's organic matter, which forms the basis of the oceanic food web and influences climate regulation through carbon dioxide absorption during photosynthesis. They possess unique glass-like cell walls that contribute to their role in organic matter production and carbon storage.

The research focuses on understanding how diatoms respond to unprecedented changes in ocean conditions due to climate change. There are approximately 200,000 diatom species, each with diverse genomes that may lead to varying responses to environmental changes. The study emphasizes diatoms' plasticity - their ability to adapt physically and functionally to different environments.

Using trait-based approaches, researchers aim to simplify the complex genetic diversity of diatoms into manageable traits that can help predict their future behavior in changing ocean conditions. These traits include growth rate, cell size, and pigment content. The research findings suggest that the relationship between phenotypes and genetic relatedness is not straightforward, indicating that phenotype cannot always be predicted from genotype alone.

The study also identifies constraints within the trait landscape, suggesting that while diatoms can adapt, their responses may be limited. The findings have implications for modeling oceanic primary production and understanding diatoms' future role within the changing marine ecosystem. Moving forward, the research will explore diatom responses in the context of environmental stressors and their potential for adaptive evolution in response to climate change.