

Life at the extremes: What cold-loving organisms can tell us about adaptation in the face of climate

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In Antarctic waters that would kill a person within minutes happily dwells a tiny, single-celled organism known as *Euplotes focardii*. In a new study, researchers from Italy's University of Camerino examine the genes and proteins behind this organism's remarkable ability to cope with its extreme environment, which is not only unthinkably cold, but also saturated with oxygen at a level that would be very stressful for most organisms. The team's findings reveal new insights about how—and how quickly—life can adapt to a changing climate.

The researchers compared the genes expressed by *Euplotes focardii* to those expressed by a cousin species that thrives in moderate temperatures. A majority of the genes expressed only by *Euplotes focardii* coded for proteins that help to defend the organism against [oxidative stress](#), a toxic buildup that results when cells interact with oxygen. The organism also was found to produce proteins that protect other proteins from oxidative and cold stress.

These protective proteins are likely an important feature the organisms evolved to adapt to the Antarctic oxygen-rich environment, and will likely serve them well as climate change alters ocean chemistry, the researchers said. The study also revealed that *Euplotes focardii* uses an unusually flexible process when decoding RNA, possibly indicating an ability to evolve more quickly than other organisms.

Cristina Miceli will present this research on Thursday, July 14 from 5:00-5:30 p.m. during the Evolution and Population Biology session in Palms Ballroom Canary 2 as part of The Allied Genetics Conference, Orlando World Center Marriott, Orlando, Florida.

Provided by Genetics Society of America

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