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### **Thermal plasticity across environmental gradients: exploring intraspecific variation in a temperate butterfly**

Due to climate change, not only average temperature, but also climate variability, and the frequency of extreme climatic events such as heat waves are increasing. In response to such changing conditions, organisms can adjust through phenotypic plasticity or evolve. Both processes can occur simultaneously, and evolution can also on plasticity itself. Being ectotherms that rely on environmental temperatures to maintain function, insects might be especially vulnerable to such change. Yet, they can occupy large geographic ranges with highly different climates that vary across latitude or altitude. Such environmental gradients are valuable tools to study the interplay between adaptation and phenotypic plasticity. This is important to better understand and predict how species will respond to a changing climate. In this talk, I will describe some common garden experiments using Glanville fritillary butterflies originating across altitudinal and latitudinal gradients. I measured how traits ranging from gene expression to development and stress response respond differently to temperature, depending on the location of origin within the gradient. Temperature clearly affected the expression of all measured traits, and while latitudinal patterns were present, they depended heavily on the trait and life-stage in question. This highlights the necessity to consider intraspecific differences and the species ecological background when predicting responses to environmental change.

