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My thesis investigates the effect that modifying parental and grandparental diets has on the fitness of their offspring and grandoffspring, using the humble fruit fly, Drosophila melanogaster. I focus on non-genetic inheritance, which is everything that parents may pass to their offspring outside of simply passing on their genes alone (often these can be effects that modify the ways genes are expressed).

I focused mostly on measuring lifespan and reproductive success. I explored questions like whether there is an advantage for offspring to be reared in the same dietary environment as their parents or grandparents, and I found surprisingly there is not, and in fact the diet that it optimal for the fitness of parents is not always optimal for their offspring, meaning that there can be conflict between the requirements of generations. I also found that grandparental diet is very important to grandoffspring lifespan and reproductive success, for example, the higher the protein that grandfathers consume, the higher their granddaughter's reproductive output.

The significance of the work is that very few studies investigate the effects of both parents together, meaning my studies are among the first to capture the interactions between parental (and grandparental) diet effects. We use fruit flies as a model in evolutionary ecology (and other disciplines) because they have what we call conserved metabolic pathways and we share around 60% of disease related genes with them. What this means is that aspects of the fruit fly physiology are analogous to many other animals, including ourselves. This opens the possibility that my work could be relevant to humans, and my work is already being used to inform some cross generational obesity research.

See also Tara-Lyn's blog, which will carry blog posts for her authored papers (with audio accompaniment), at https://taralync.medium.com/
And her 3-minute thesis presentation, at https://vimeo.com/428376678