Robust embryonic scaling is critical to early development and faithful reproduction of an organism. Interestingly, scaling can be achieved in different ways; here we investigate early embryos of *Drosophila melanogaster* in order to elucidate alternative mechanisms that allow Anterior-Posterior (A-P) scaling to be achieved. In embryos from flies which have been selected on the sole basis of their egg size, we show that scaling can be achieved by means other than those previously reported. Here we observe that the level of Bicoid (Bcd) protein in the anterior tip is dramatically lower than we would have expected in a large embryo; this coupled with our subsequent observation that the length constant lambda (λ) demonstrates a dramatic increase over wildtype. Here, we also show that downstream patterning has not been significantly changed when evaluated on a relative scale, this is supported by the similarity of relative lambda (normalized by egg length) to be similar to wildtype. We suspect that the phenomena that we have observed here, an increase in absolute lambda coupled with a decrease in B0, can be most easily be explained by a decrease in the production rate *J* and an increase in diffusion, D. Further, we attempt to asses differences *J* via fluorescent *in situ* hybridization of Bcd mRNA in these embryos and found that mRNA levels are similar to those of wildtype embryos despite a dramatic difference in egg size. This suggests that the scaling feature is evolutionarily robust and that the mechanisms which cooperate to achieve scaling can function redundantly.

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The premise of the argument is that the process of scaling is evolutionarily required for successful propgagation of the species. If scaling is considered the problem, then it follows that there can possibly exist multiple solutions. As we have shown previously, scaling between embryos of large and small size can be achieved or explained by merely changing the amount of Bcd mRNA maternally deposited by the nurse cells during oogenesis. Characteristics exhibited by increased Bcd mRNA deposition include increased B0 of the protein gradient at the anterior tip and the length constant lambda (λ) remains similar to wildtype (~100um).

Interestingly, one of the lines we examined, which have been selected on the basis of increased egg size (ref C.Miles) exhibited scaling but lacks the characteristic increased B0 and wt λ (~100um). Instead, the eggs exhibit much lower B0 than expected, coupled with a dramatically increased length constant (~133 um). To investigate whether an increased amount of Bcd mRNA was responsible for the egg scaling, but is contraindicated by the B0 measurement below expectation. As predicted, we show that the amount of Bcd mRNA is not significantly increased over wildtype (2x Bcd).

Preliminary findings from C. Miles show that there is not a significant shift in the Eve stripe boundaries in terms of relative egg length in these large lines when compared to wildtype. This indicates that scaling has indeed been achieved; although through an apparently different mechanism. We show that this line of embryos has achieved scaling through an alternative mechanism, instead of increasing J via increased Bcd mRNA deposition, and rather an increase in diffusion (D).