### Robustness of central metabolic fluxes during glucose growth to salt stress

Given the many cellular changes observed in mRNA and protein levels, we turned to 13C labeling techniques (Zamboni et al. 2009; Houser et al. 2015) to examine the extent to which these changes effected the relative flow of metabolism through central metabolic pathways during exponential growth. For this work we concentrated upon growth on glucose during NaCl and MgCl2 stresses. Across the salt concentrations utilized growth changed over nearly a two-fold range, with the doubling time changing from approximately 50 to 95 minutes. NaCl levels decreased growth by a third, getting monotonically worse with higher levels, yet there were no significant changes observed in central metabolism. Intermediate MgCl2 levels permitted the fastest growth, with ~10% slower growth at 8 mM and below, and ~50% slower growth at 400 mM. Although the relative flux at several key splits in metabolism was unchanged across this range, several changed significantly. The proportion of oxaloacetate generated from phospoenolpyruvate and pentose-5-phosphate from glucose-6-phosphate both decreased (and thus pentose-5-phosphate from glyceraldehyde-3-phosphate decreased) when growth was slow at either high or low concentrations. As these changes were not observed during NaCl stress that led to similar growth defects, they do not simply arise as a consequence of slowed growth and we speculate that they may be specific to MgCl2 stress. With the exception of those changes, however, the general picture was that homeostasis in central metabolism was sufficient to ward off significant changes in relative pathway use despite large effects upon overall growth rate and the pools of mRNA and proteins.