

Chemical Engineering Thesis Defense

Metabolic Cross-Feeding in Engineered Co-Cultures of *Escherichia coli*

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Abstract

Single and double deletion strains of *Escherichia coli* were grown in paired co-cultures with an intent to identify examples of metabolite exchange and cooperative interactions between strains. The genes *pheA*, *argA*, *tyrA*, *trpC*, *pykF*, *pykA*, *mdh*, *ppc*, and *nuoN* were deleted from *Escherichia coli* strains BW25113 and ATCC 9637. Cultures were paired at three different initial ratios and grown at plate and flask scale. Optical density measurements were used to observe the performance of tested co-cultures, with changes in maximum optical density and growth rate used as indicators of interaction or lack thereof between tested pairs. Auxotrophic strains unable to produce essential amino acids were observed to grow in co-culture but not in monoculture, indicative of metabolite exchange facilitating growth. Some data for non-essential pairs with *pykF* was indicative of metabolite exchange. The initial frequency of paired mutants with non-essential deletions appeared to have an impact on growth performance, but whether this was indicative of any beneficial exchange was not able to be determined.



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Zoom Link: <https://asu.zoom.us/j/89511827462>