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Using the E. coli RuBisCO assembly system, it may be possible to enhance the effectiveness of plant RuBisCo to increase crop yields. Simply increasing the total amount of plant RuBisCO would greatly impact total atmospheric CO2 fixation as well as plant growth.

It has been calculated that even marginal increases in total enzyme quantity would have a substantial effect on total carbon fixation (Zhu et al., 2014). However, the most pronounced effects with be seen through selective mutagenesis, and the development of more efficient RuBisCo. This could be accomplished by site directed mutagenesis to increase RuBisCos affinity for CO2 and prevent the unfavorable oxygenation reaction (Furbank etal., 2017). This increased efficient in Rubisco carboxylation decreases the overall amount of nitrogen needed to support photosynthesis and plant growth (Carmo-Silvaet al., 2017)While the methods established by Aigner et al. were aimed specifically at the expression of RuBisCo, there may be potential to use the concepts in order to modify RuBisCo Activase (RcA).

RcA serves to reactivate RuBisCo after product inhibition. RcA is intolerant to high levels of heat, low amounts of light, as well as under the supervision of a specific chaperone. If the chaperone of RcA can be characterized and expressed in in E. coli then it could be possible to optimize the enzyme (Parry et al., 2012).

RcA’s heat tolerance could also be modulated through a mutagenic analysis similar to those proposed for RuBisCo. The reduction of RcA’s susceptibility to heat stress, increases RuBisCos productivity in warmer climates. This increases overall net atmospheric CO2 fixation, and may hopefully contribute

to efforts to modify climate change(Mueller-Cajar et al., 2014) Therefore the E. coli RuBisCO assembly system, developed by Aigner et al provides an invaluable tool which will have an immeasurable impact on the world.

As the human population continues to increase, and with the danger of climate control lurking closer, the ability to increase RuBisCos CO2 fixation comes right on time. Increasing the enzymes quantity and catalytic efficiency should lead to the development of larger and more robust crops crops. The knowledge gained by working with RuBisCo may also provide insight on developing a plant RuBisCo Activase which is more stable. This development would act as a multiplier to the benefits already seen in RuBisCo engineering.