

Glycolate Reduces Photosystem II Electron Transport

Nicholas Ferrari¹, Brandon Russell¹ and David J. Vinyard¹

¹Louisiana State University. 202 Life Science Building, Baton Rouge, LA 70803.
nferr11@lsu.edu.

Glycolate is a major metabolite produced in oxygenic photosynthetic organisms lacking a carbon-concentrating mechanism. The accumulation of glycolate prevents growth under atmospheric carbon dioxide concentrations. Metabolic pathways such as photorespiration have evolved to transport and convert glycolate into 3-phosphoglyceric acid. Glycolate has previously been shown *in vitro* to compete with bicarbonate as a ligand for the non-heme iron (NHI) of photosystem II. Here we show evidence *in vivo* that glycolate binds at the NHI and disrupts electron transport to Q_A.

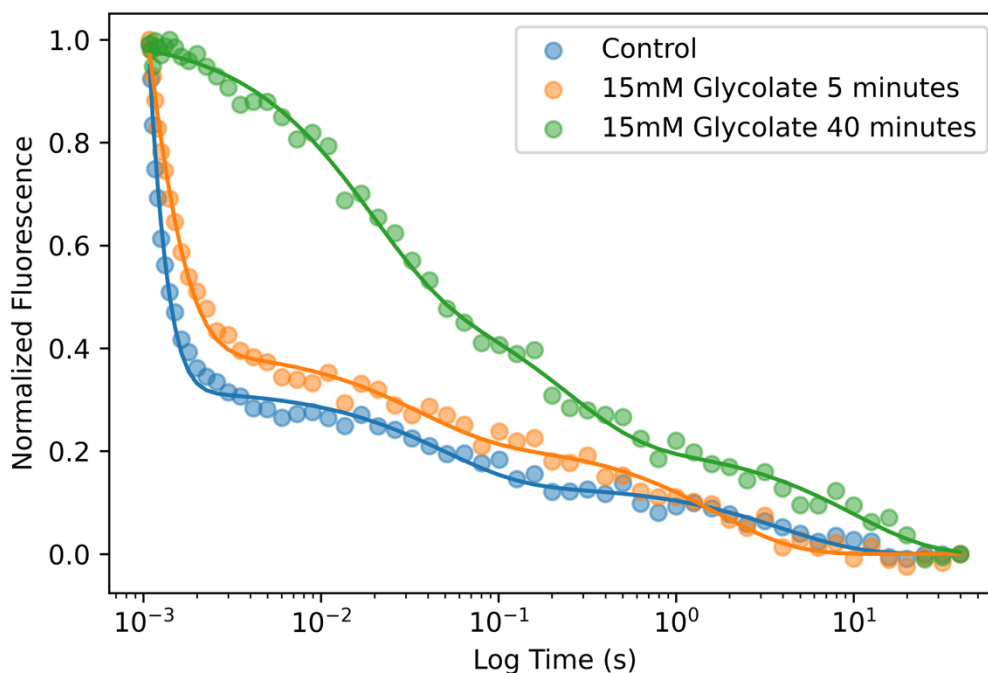


Fig. 1. Fluorescent relaxation of PSII after a single turnover flash in *C. reinhardtii* grown at 50 $\mu\text{mol m}^{-2} \text{s}^{-1}$ in TAP media. The cultures were treated with 15mM glycolate for 5 and 40 minutes before measurement. The data was modeled with a triexponential decay function.