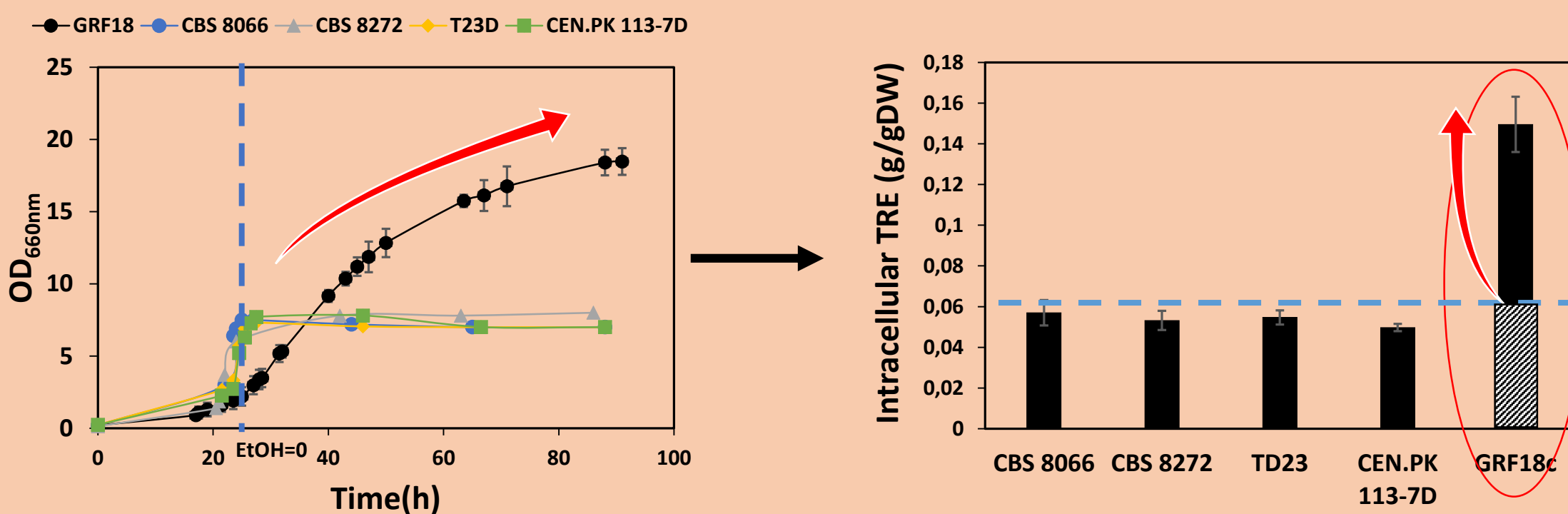


Glutamate as a potential substrate for trehalose production in yeast

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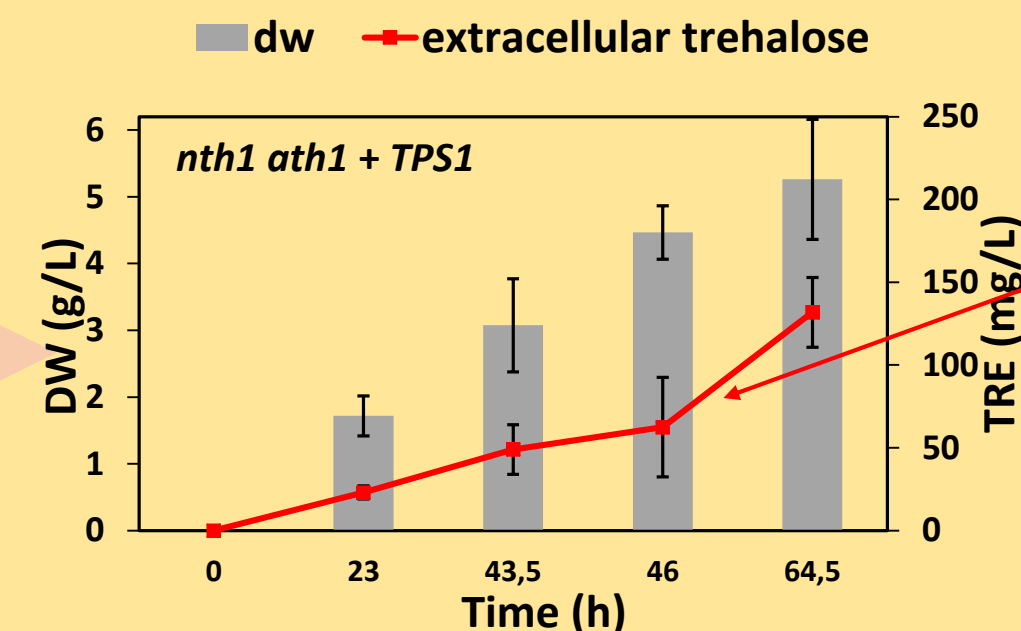
Trehalose (TRE) is a valuable biotechnological product with application in chemical, pharmaceutical and food industries and under investigation in preventive treatment of human diseases. State-of-the-art production methods involve cellular/enzymatic biotransformation from oligosaccharides chains which lead to high yields but require a complex purification step from a mixture of several sugars. TRE produced from yeast cells is very pure, but cell lysis and purification steps are required. Our work explore an innovative production from *Saccharomyces cerevisiae* using glutamate as both nitrogen and carbon source avoiding a typical starvation steps, redirecting excretion to the culture medium. Minimize purification steps of the disaccharide would be a challenge to extend the application to all industries.

1. GRF18 strain can accumulate large amounts of TRE on glutamate

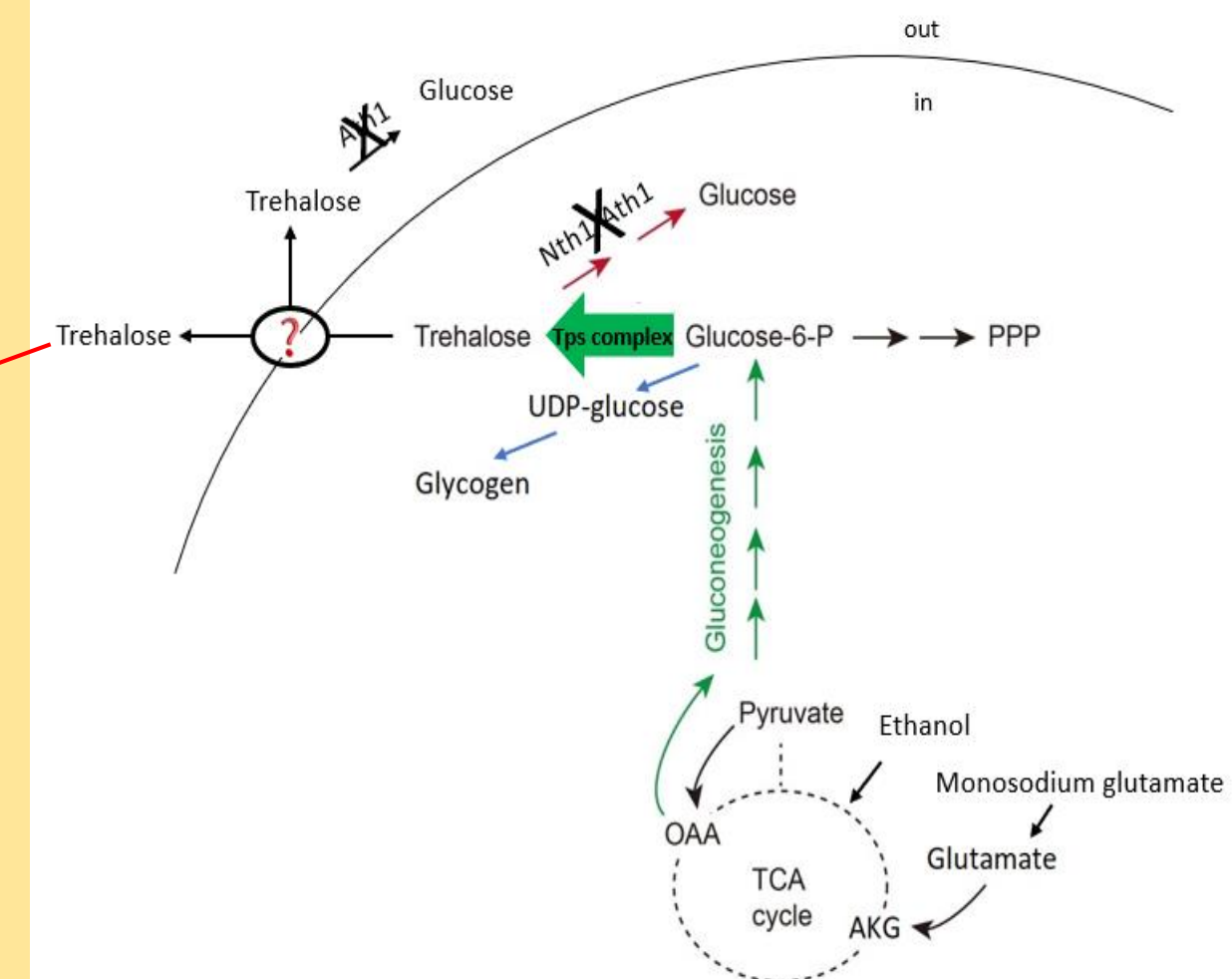


Among several strains assayed, only GRF18c showed glutamate consumption and TRE overaccumulation at the exhaustion of the main carbon source.

2. Trehalase inactivation yield stable TRE secretion



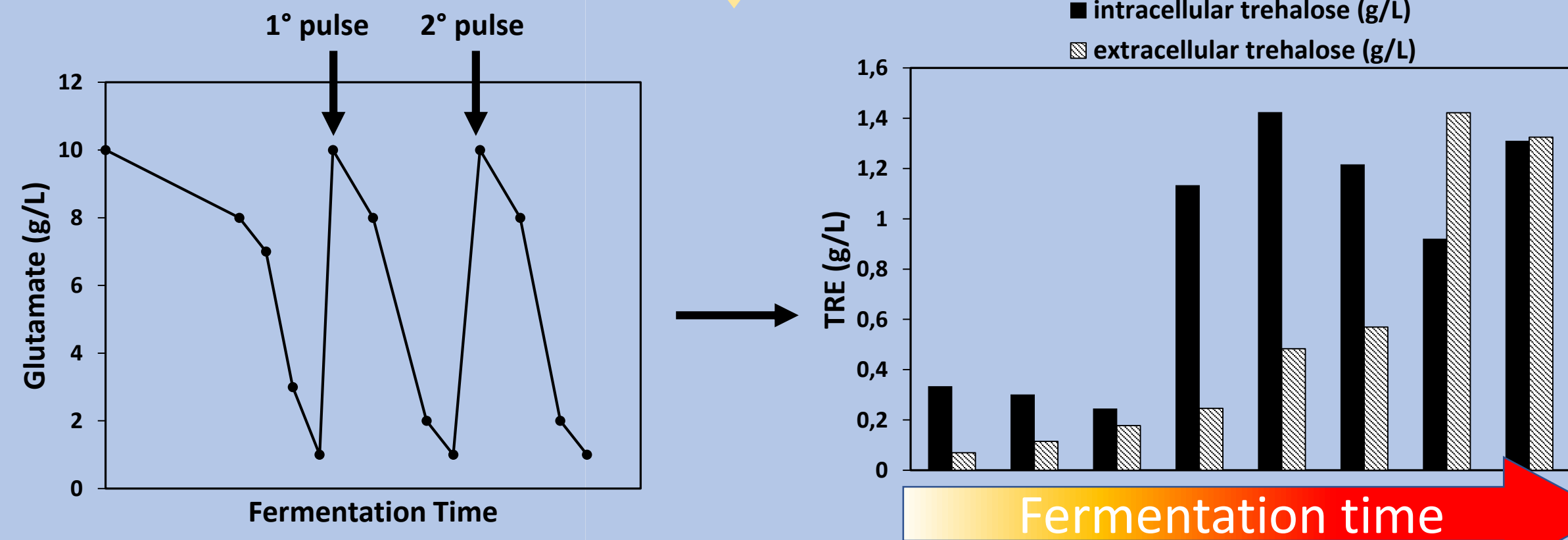
The inactivation of both NTH1 and ATH1 genes apparently forced cells to excrete the excess of TRE coming from glutamate through gluconeogenesis



4. Process modeling

A model is under preparation, encompassing several reactions and the main intracellular and extracellular species. We hope the model could be used to elucidate the roles of internal and external trehalases during the normal TRE metabolism, and to predict the best conditions for extracellular TRE accumulation

3. Extension of glutamate consumption increases TRE production



Pulse feeding cultivation strategy with highly concentrated medium. The absence of Ath1 and Nth1 activity prevented degradation of TRE resulting in high volumetric titre.