

ABSTRACT

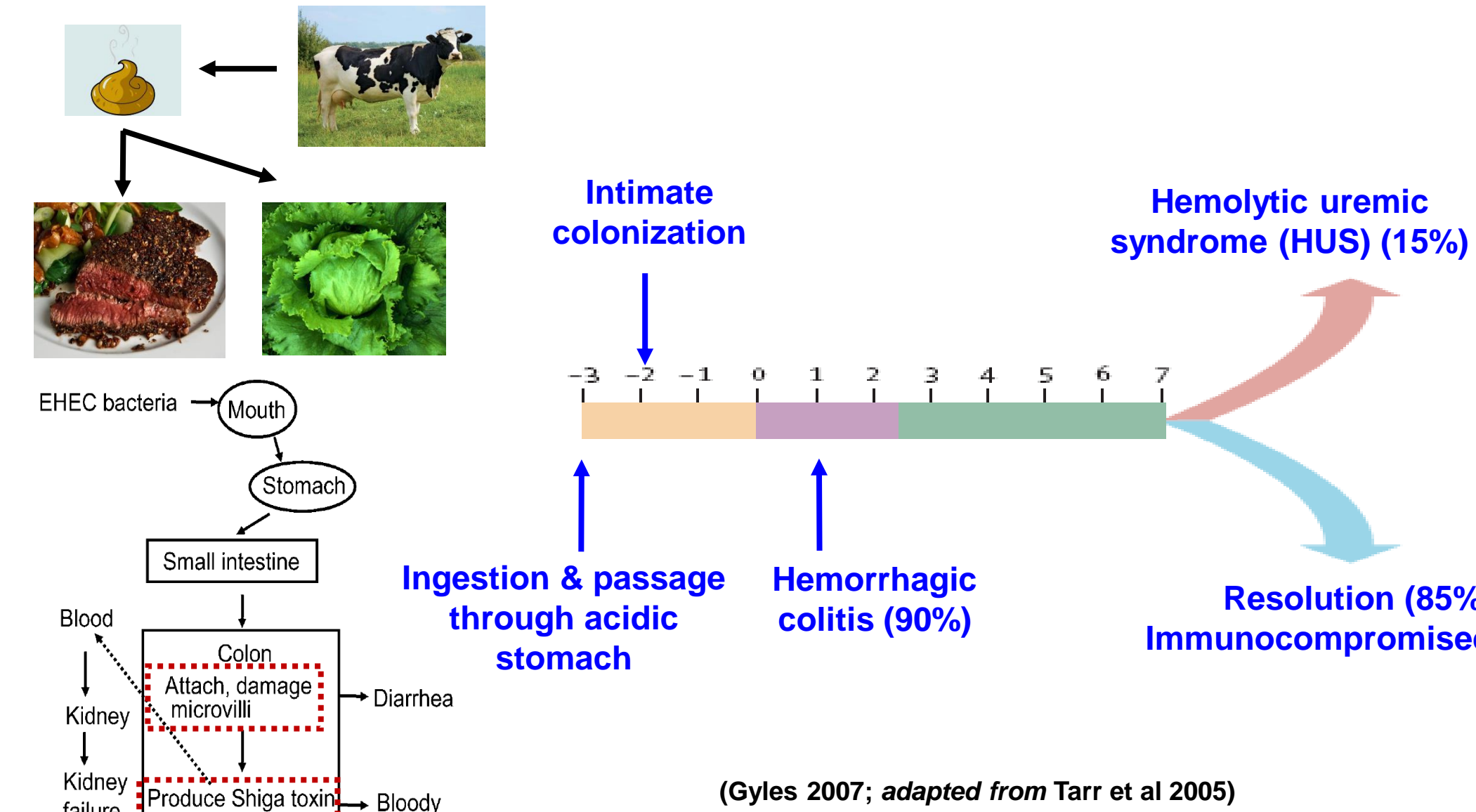
INTRODUCTION

- Escherichia coli* O157:H7, also known as enterohemorrhagic *E. coli* (EHEC), is a serious food borne pathogen. EHEC causes hemorrhagic colitis in 90% of cases, which then leads to the life threatening hemolytic uremic syndrome (HUS) in ~15% of cases.
- EHEC is a zoonotic pathogen and humans are an accidental host. A key factor to EHEC being a successful pathogen is due its ability to survive various stress environments in the zoonotic and human hosts.
- It is known that the transcription factor σ^S is an important activator of stress response during stationary growth phase in EHEC. In this study, we attempted to determine the role of σ^S during exponential growth phase in EHEC.

RESULTS

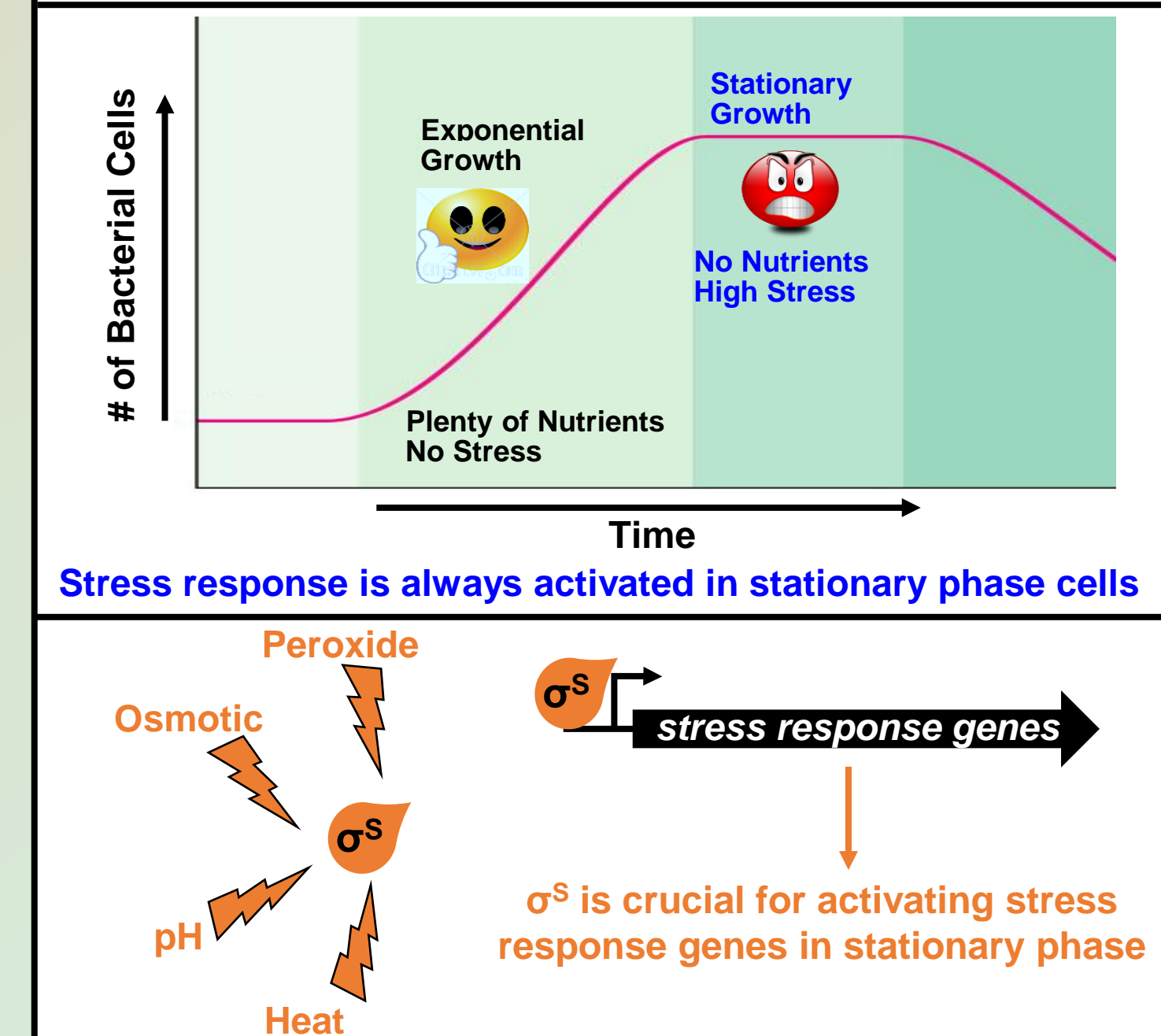
- σ^S is required for survival in the presence of 1M NaCl and high temperatures during exponential growth of *E. coli* O157:H7.
- σ^S is partially dispensable for survival in peroxide during exponential growth of *E. coli* O157:H7.

E. coli O157:H7 INFECTION CYCLE



BACKGROUND

STRESS RESPONSE IN *E. coli* O157:H7

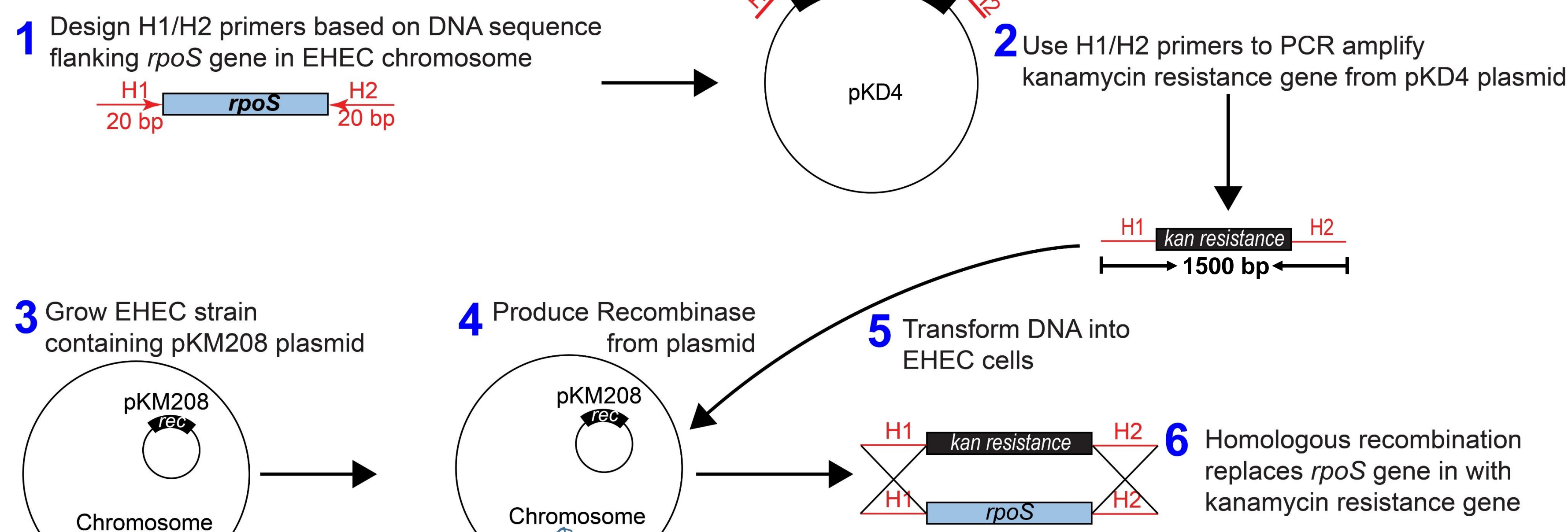


GOALS OF OUR STUDY

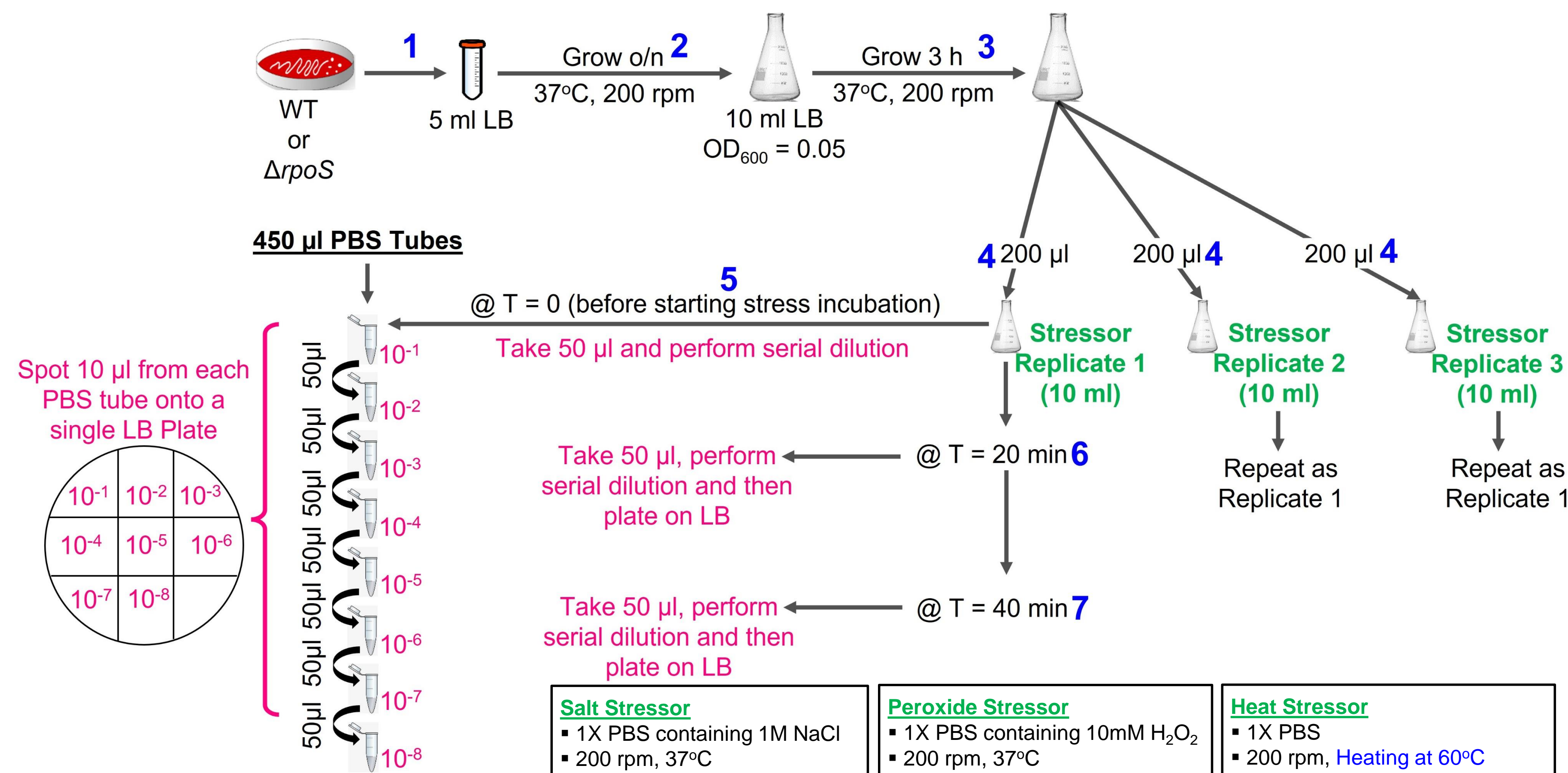
- Is σ^S required for stress response in cells from exponential phase?
 - Does σ^S contribute to all or specific stress responses?
- APPROACH**
- Construct σ^S deletion mutant.
 - Harvest WT and *rpoS* mutant cells from exponential phase.
 - Determine viability of cells in the presence of different stressors.

METHODS

Construction of Gene Deletion Mutant in *E. coli* O157:H7

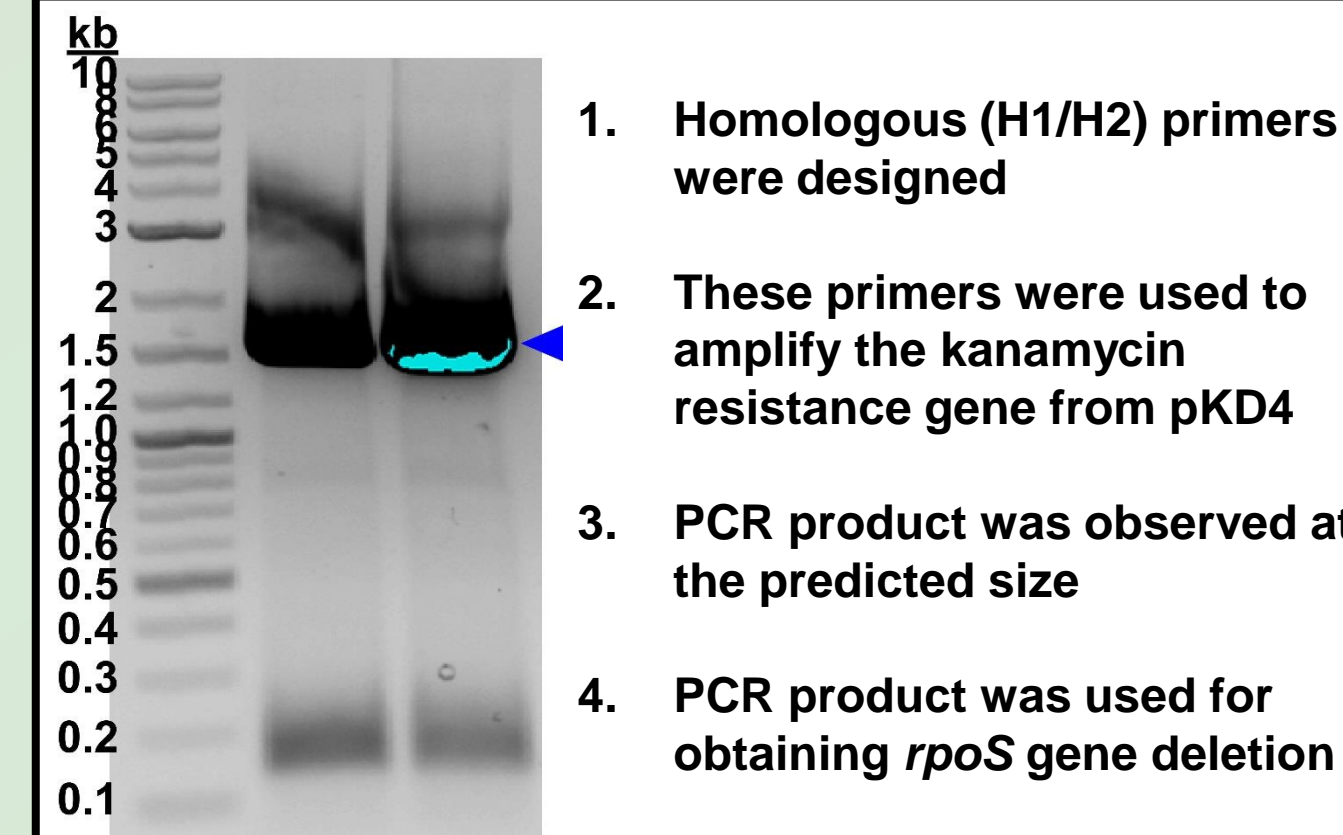


Stress Assays to Determine Viability of *E. coli* O157:H7 strains

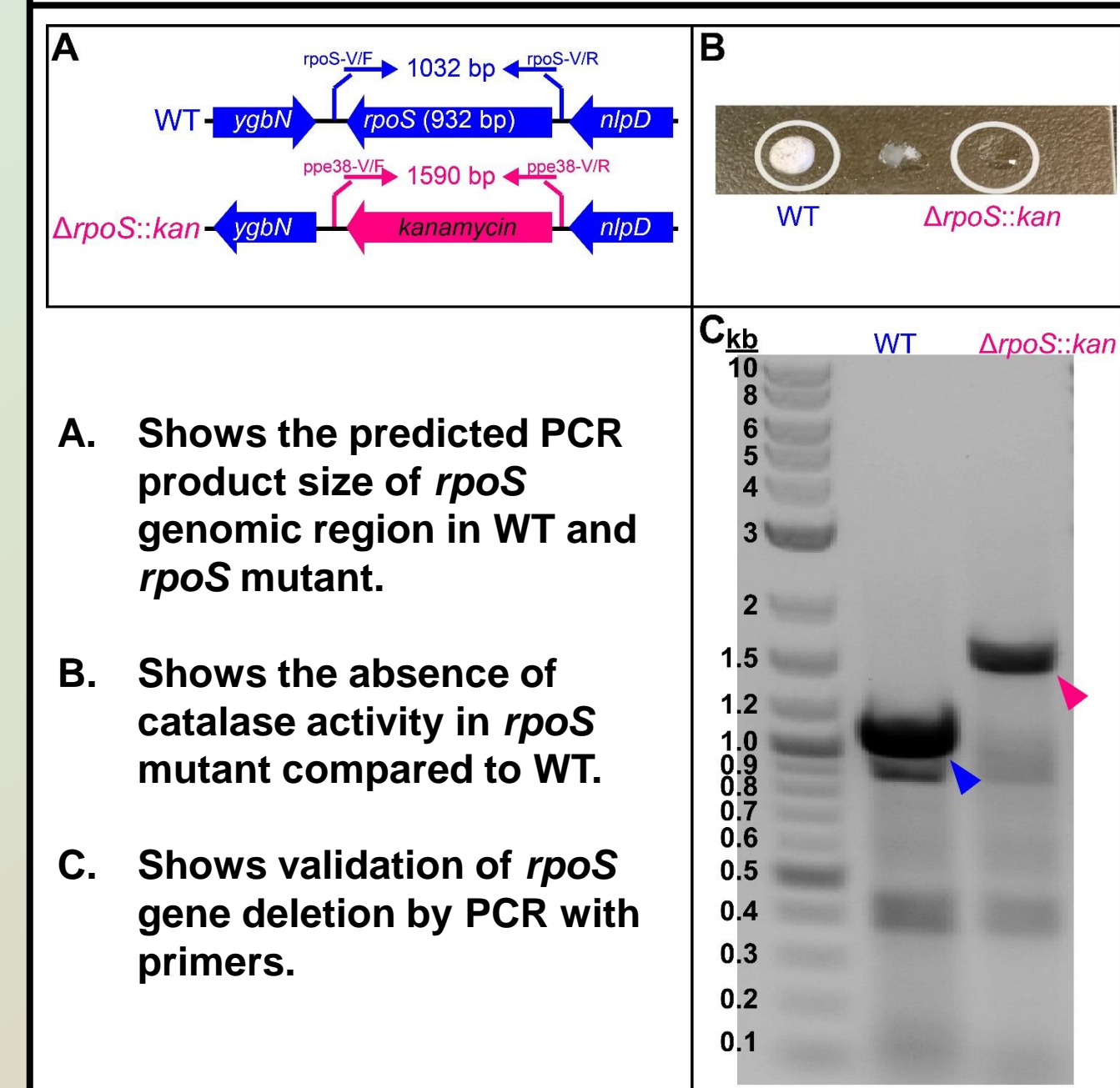


RESULTS

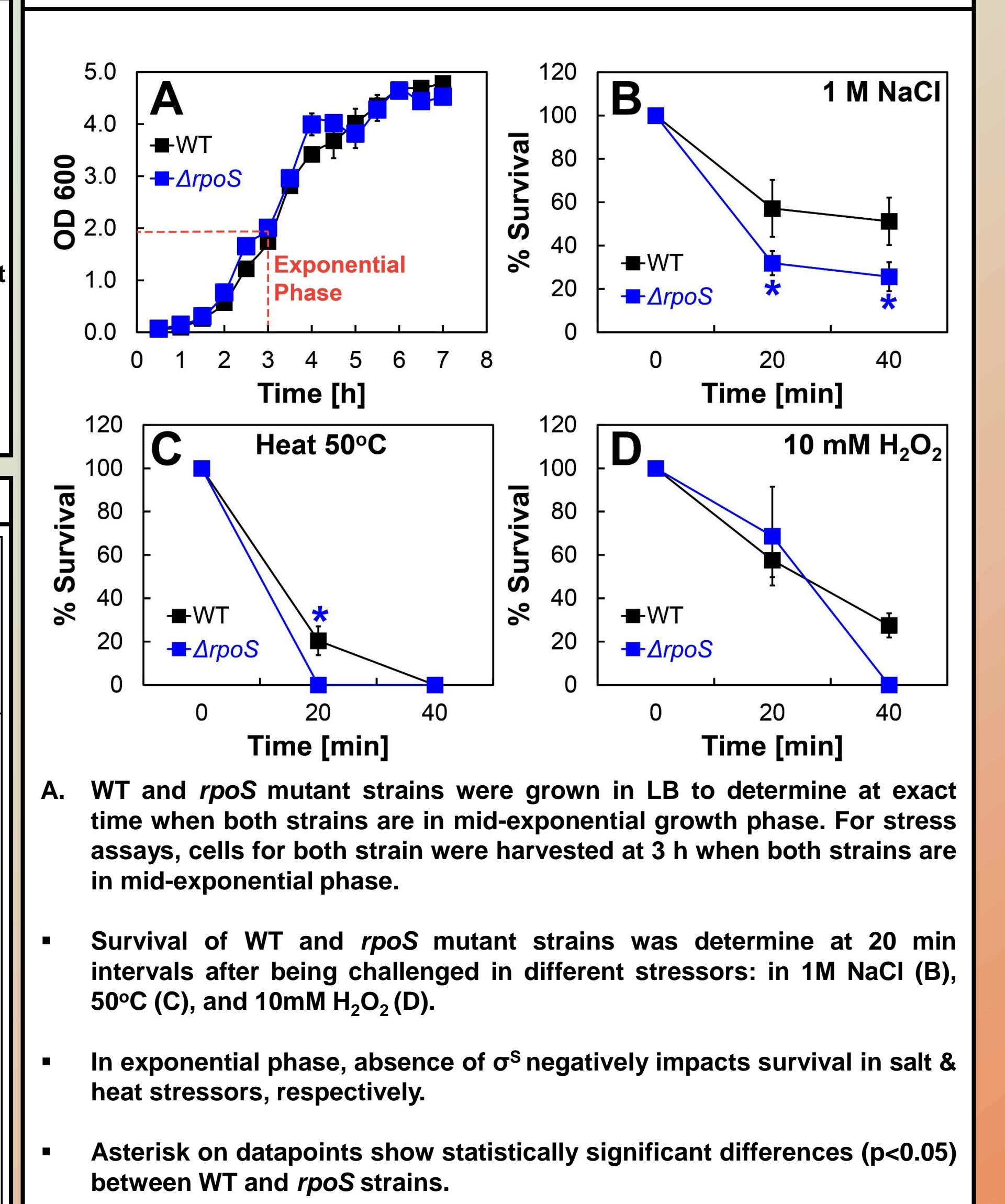
1. Amplification of kanamycin gene from pKD4



2. Validation of $\Delta rpoS$ mutant strain



3. Growth Experiments & Survival Assays of WT and $\Delta rpoS$



CONCLUSIONS

- σ^S is required to overcome osmotic (1M NaCl) and heat stress during exponential growth of EHEC.
- During exponential growth, EHEC has minimal requirement for σ^S to overcome peroxide stress.

FUTURE DIRECTIONS

- Determine if this phenotype is conserved in non-pathogenic & lab strains of *E. coli*.
- Determine roles of other σ^S related transcription factors.