# The broken story of a broken chromosome:

## Is the DNA damage checkpoint override determined by the amount of resected DNA in yeast?

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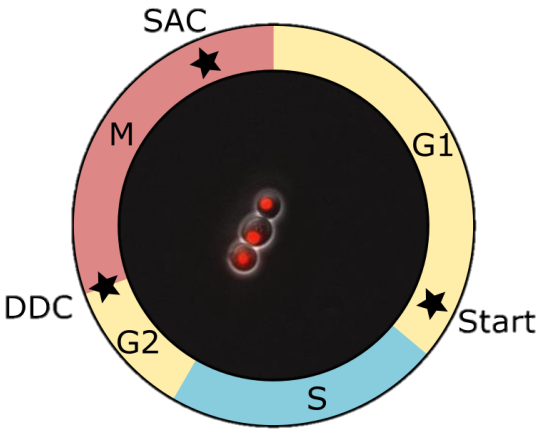
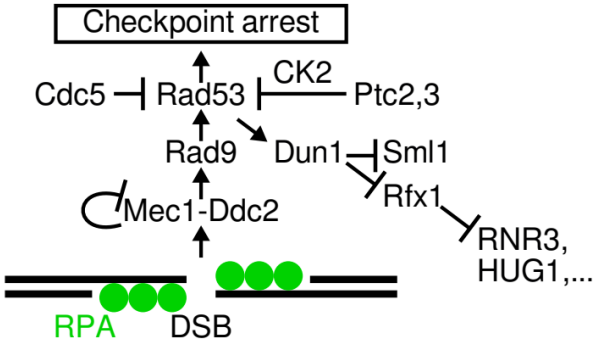
SPS Meeting

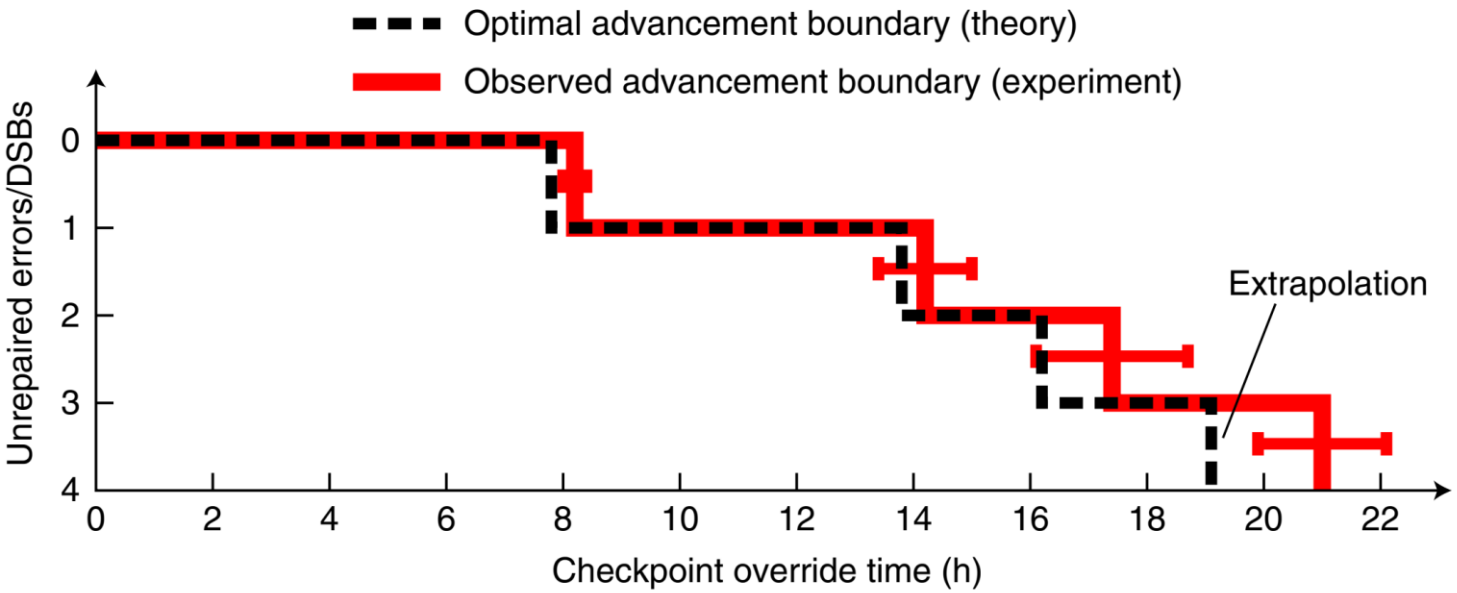
12.09.2024

# Introduction: DNA damage checkpoint



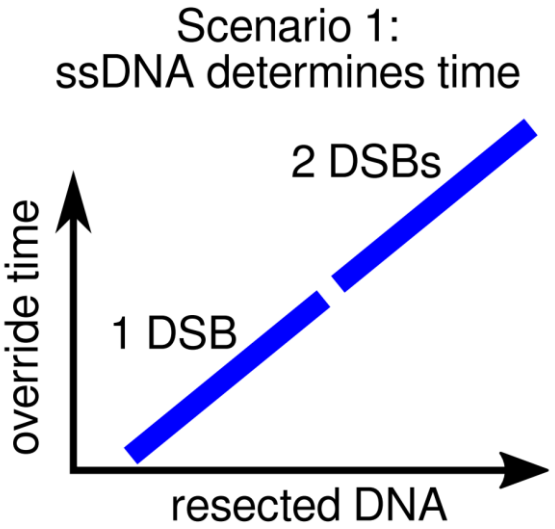



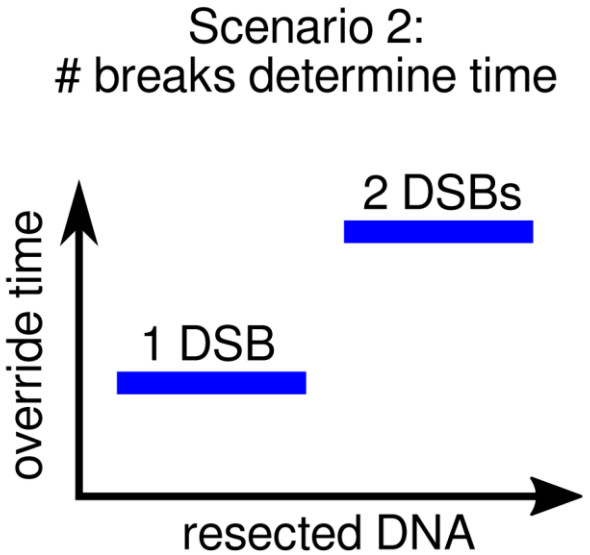
# Current models




Sadeghi et al., Nature Physics 2022

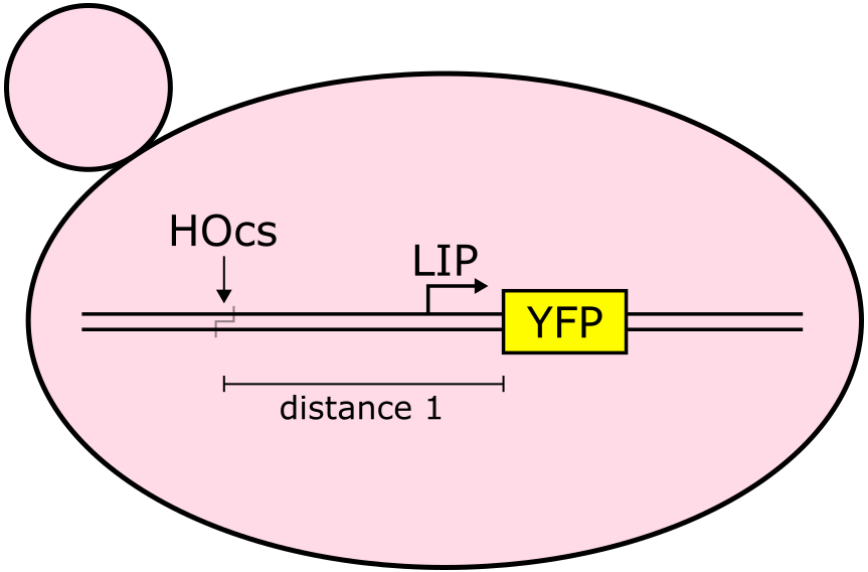
# Current models



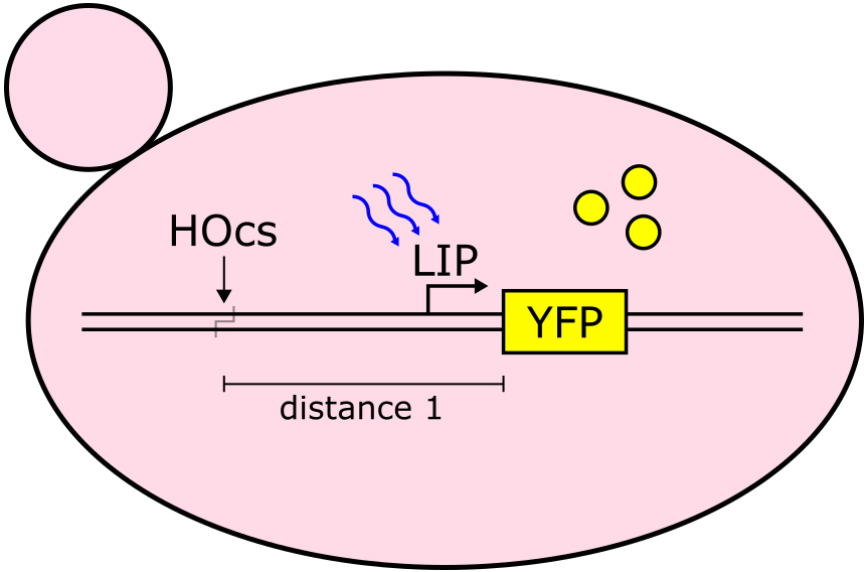

*yku70Δ*: **faster** resection: override defective
*mre11Δ*: **slower** resection: not override defective
*sgs1Δ*: **slower** resection: override defective
Lee et al., Cell 1998
Eapen et al., MCB 2012

# Typical experimental procedure



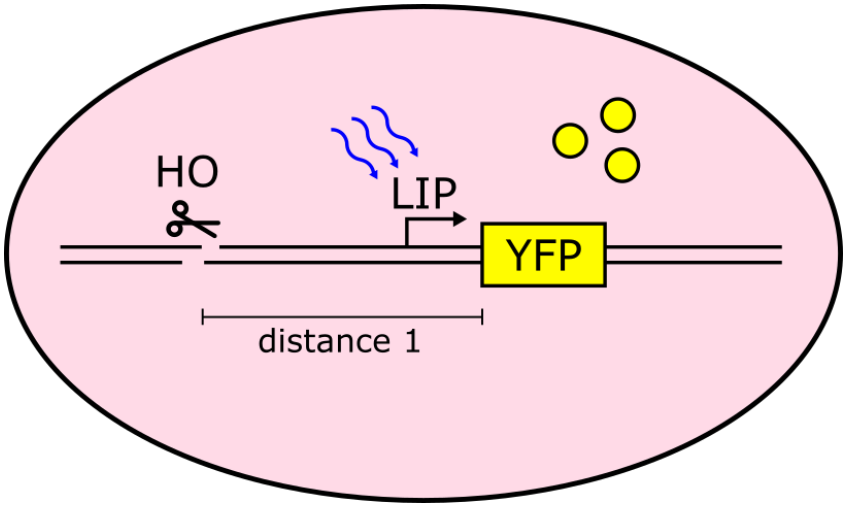
# Typical experimental procedure

- LIP induction



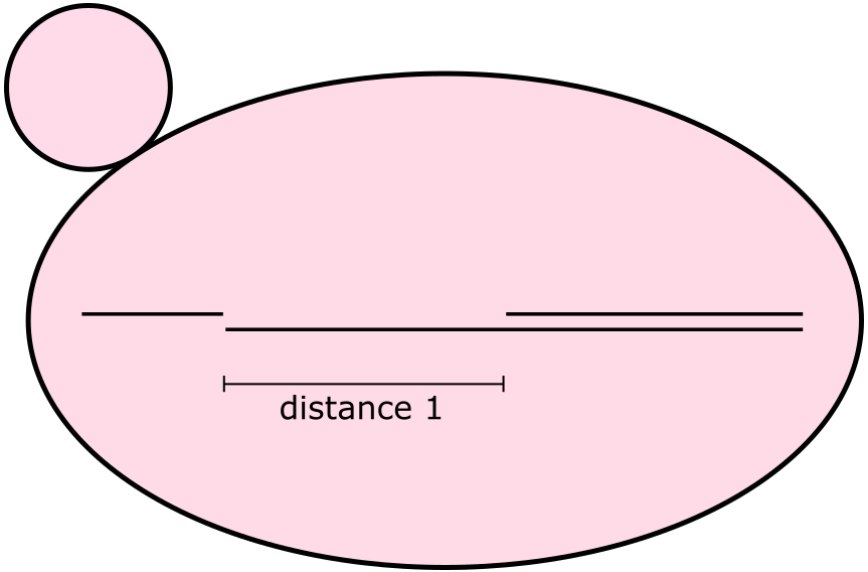
# Typical experimental procedure

- DSB induction



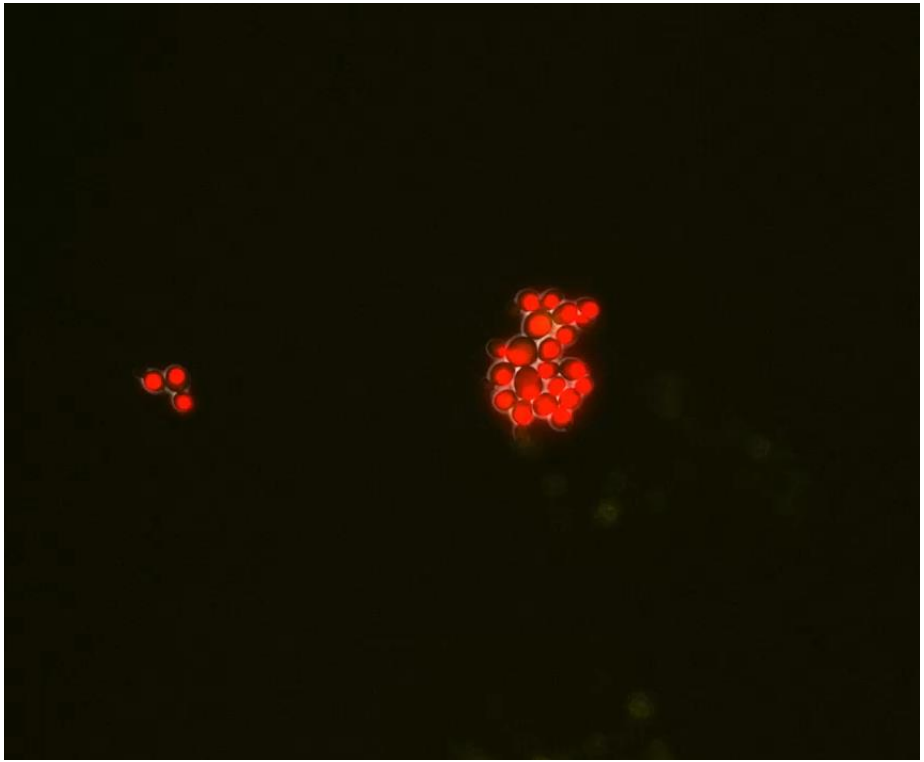
# Typical experimental procedure

- Resection

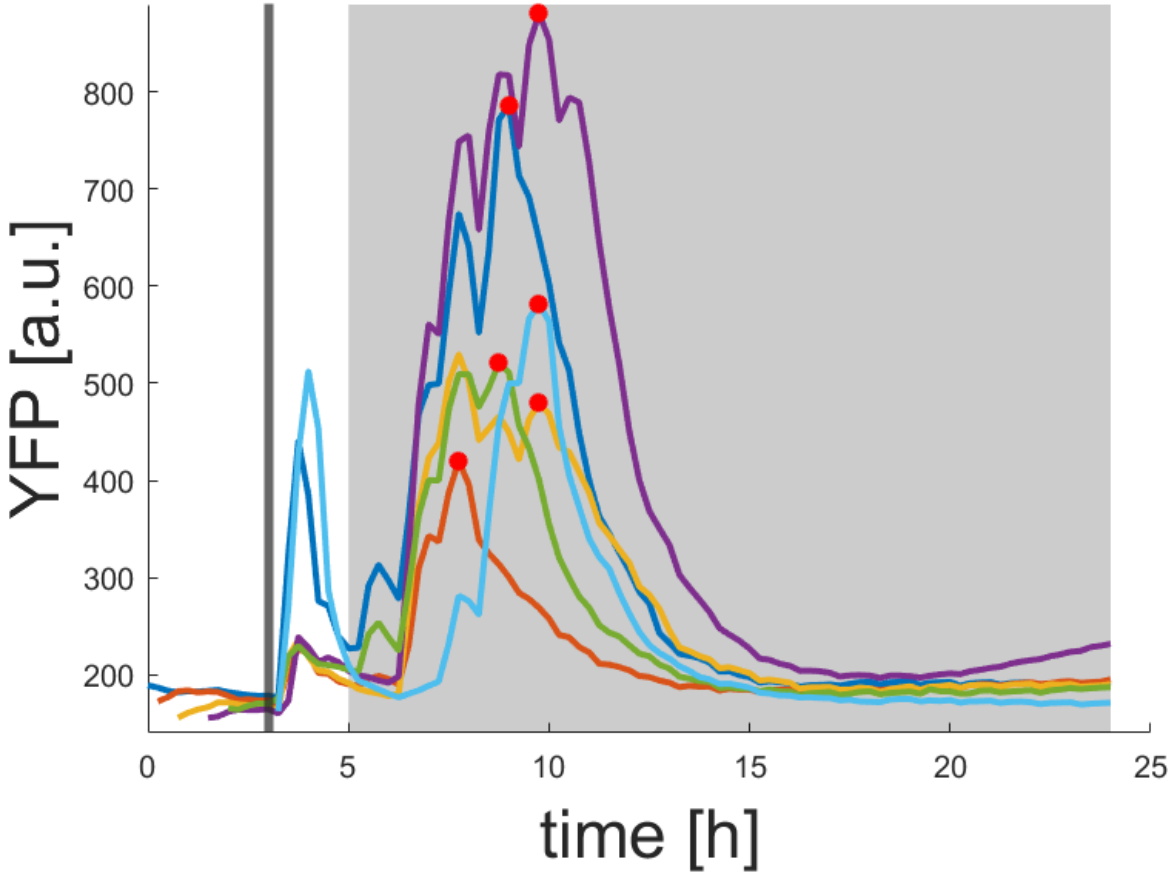


# Typical experiment



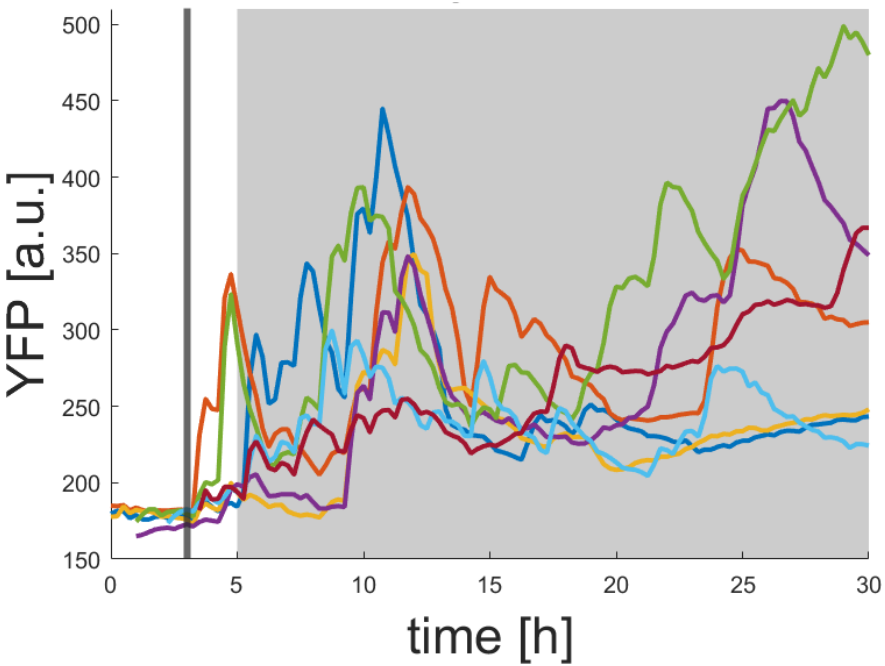


# Typical YFP signal for a trip wire at 8.7 kb



# Controls for a trip wire at 8.7 kb

Mutant with no resection: *exo1-sgs1-*



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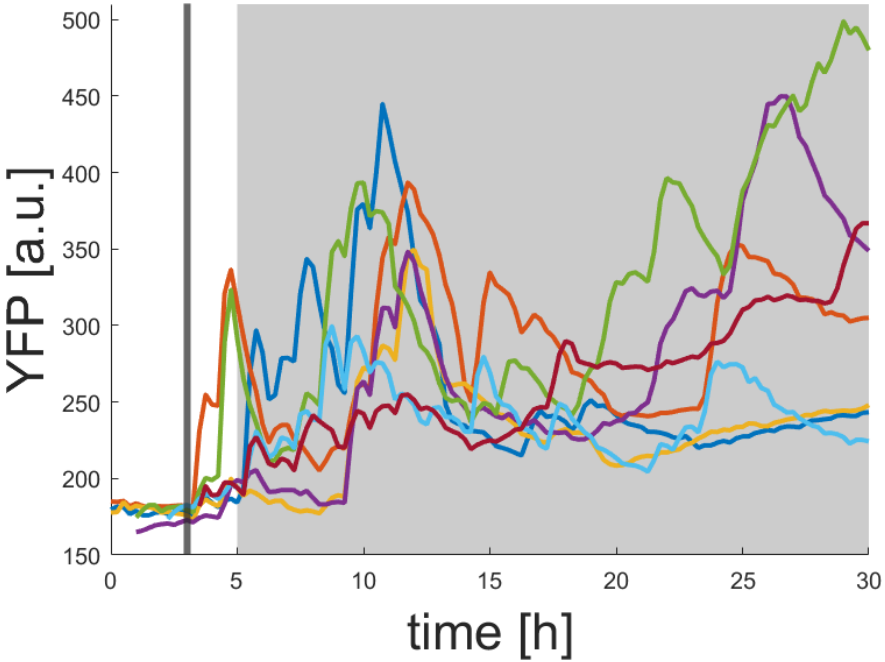
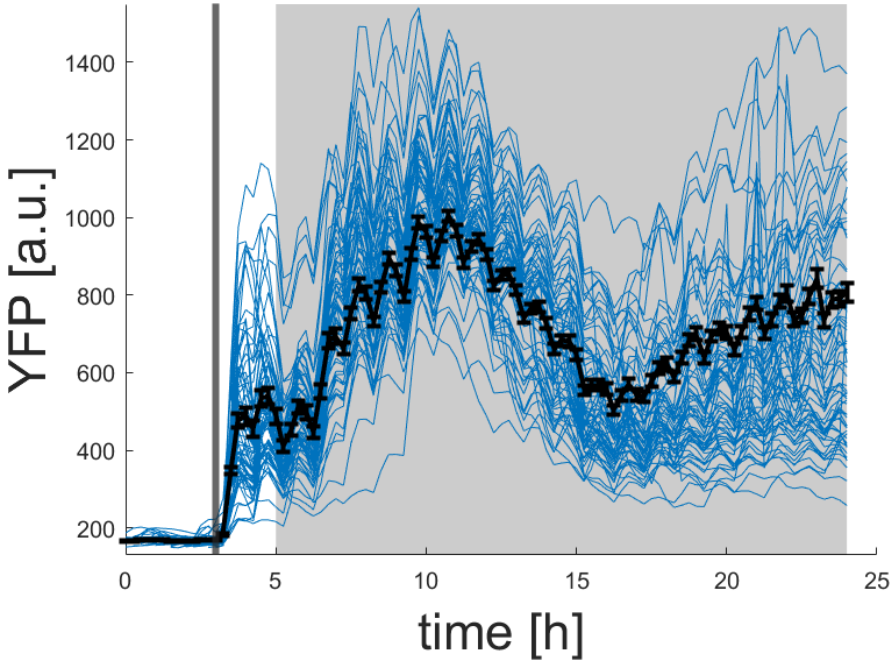
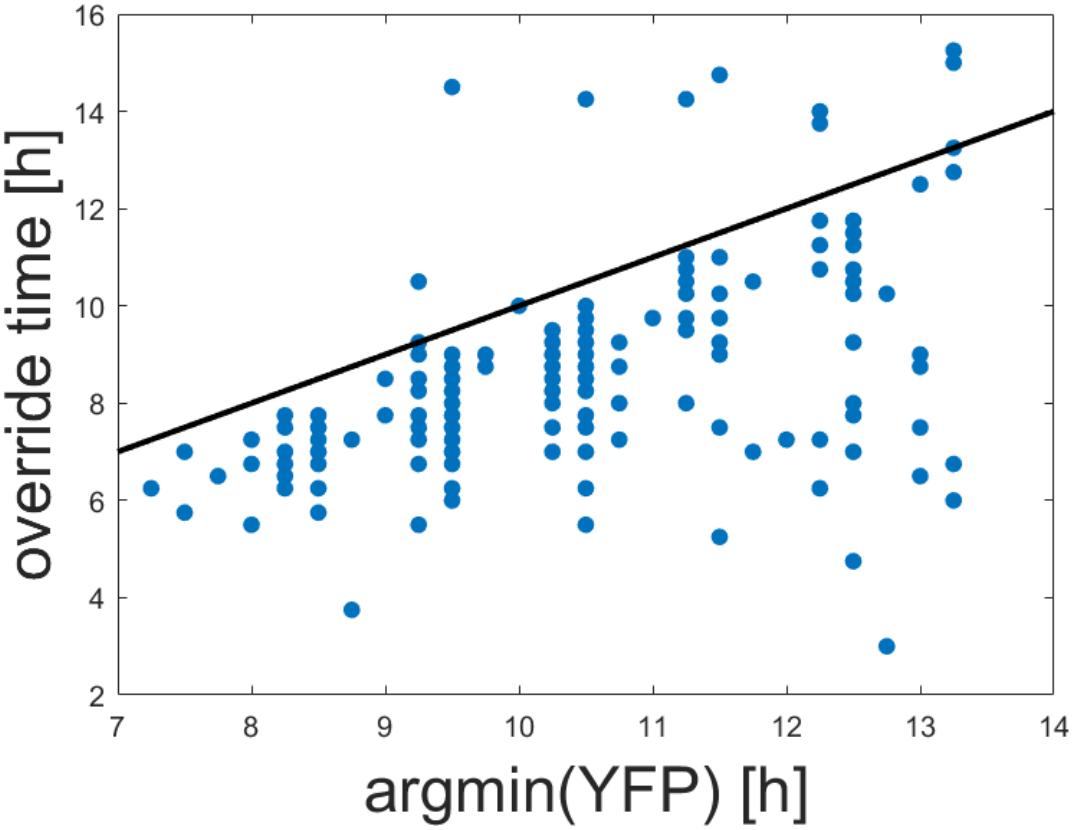



Tripwire on another chromosome



# Transcription inhibition at override



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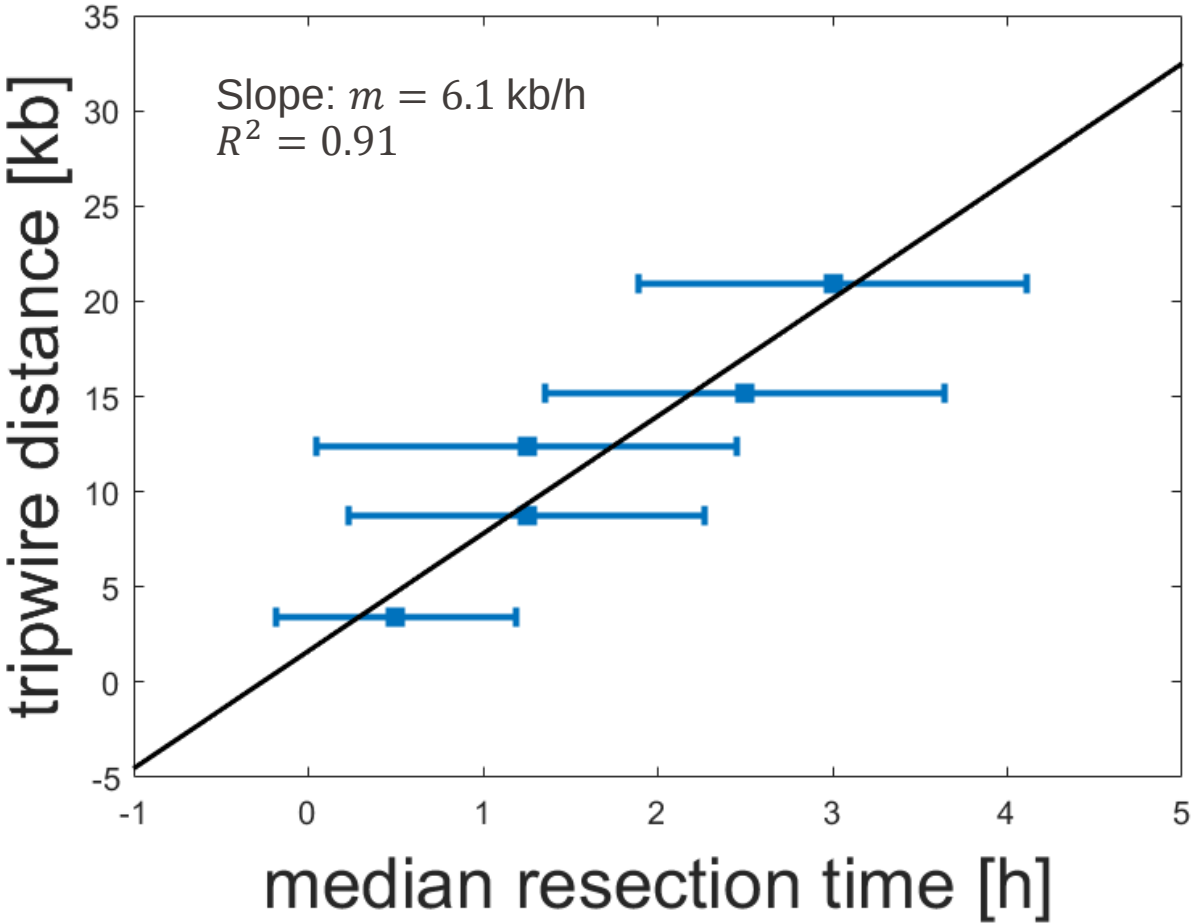
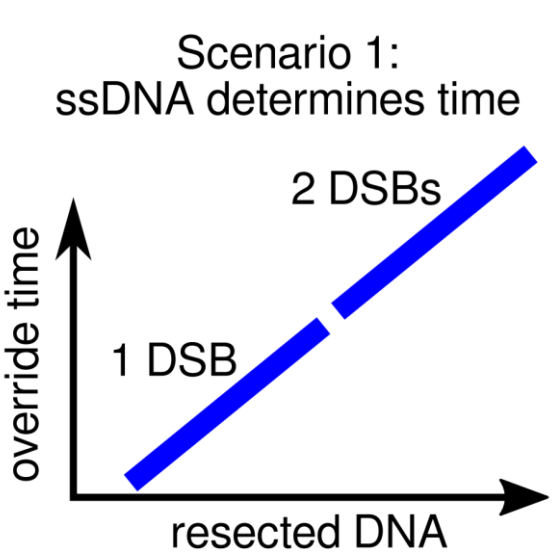
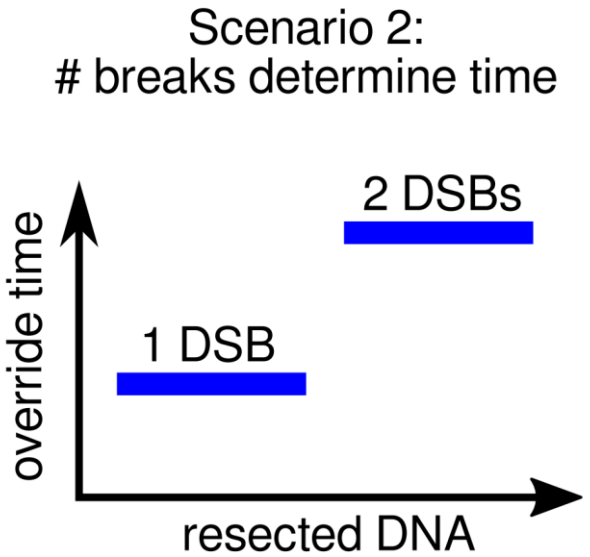
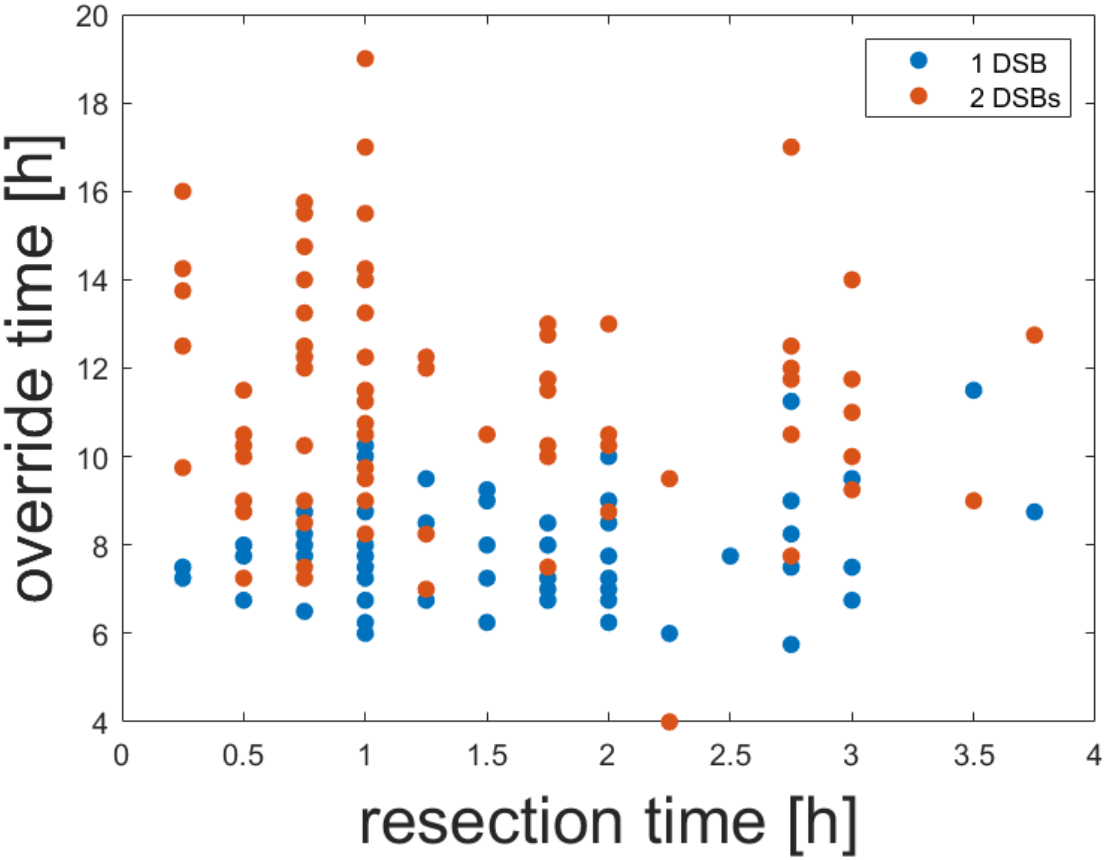


# Current models

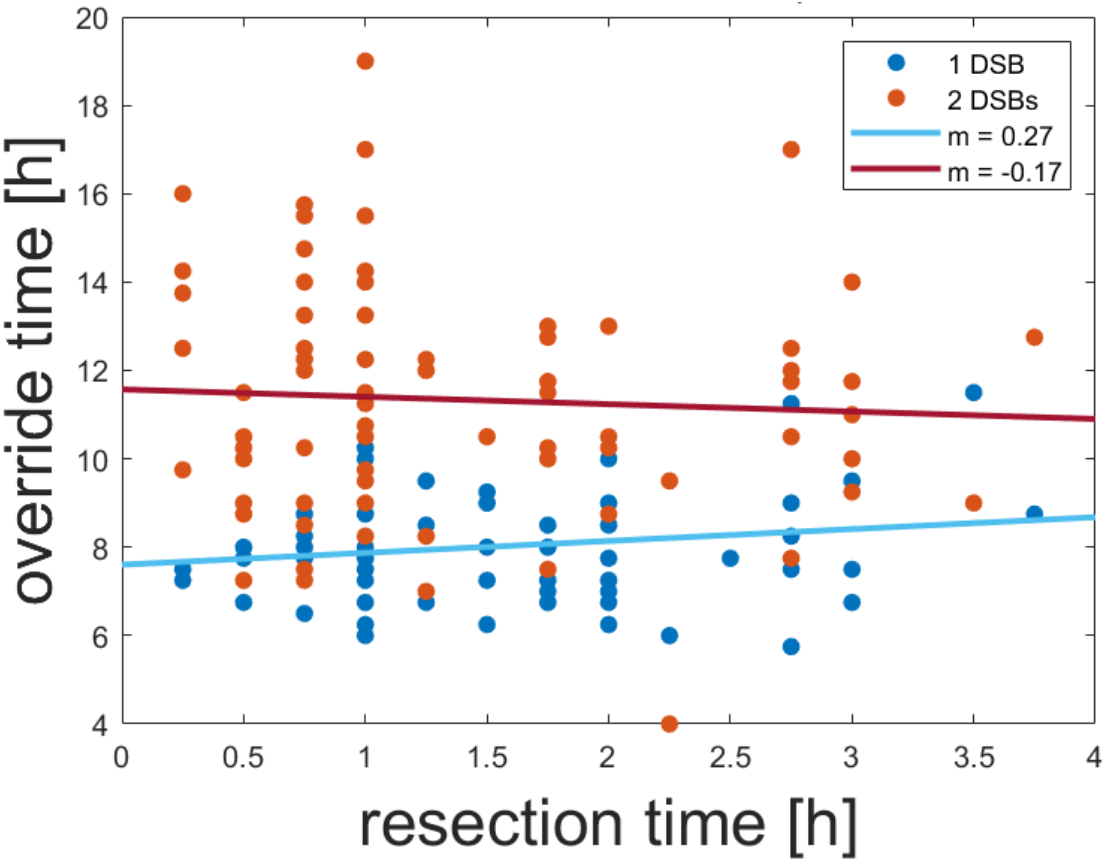


# Override time vs resection time



# Override time vs resection time




- 1 DSB:
  - $R^2 = 0.03$
  - $Correlation: r = 0.17$
- 2 DSBs:
  - $R^2 = 0.003$
  - $Correlation: r = -0.14$

# Thank you!