

Thesis Changes Log

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PhD Program: Life Sciences

Title of Thesis: The role of genome maintenance proteins in primed CRISPR adaptation by the type I-E CRISPR-Cas system

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The thesis document includes the following changes in answer to the external review process.

The Bibliography, figure references and several typos were corrected as suggested by the Jury members.

Publications

Page 5:

- “*Sci. Adv.*, 8(47), 8650” → “*Sci. Adv.*, 8(47), eabn8650”

Table of contents

Page 8:

- “4.2.1. *E. coli* RecBCD and RecJ...” → “4.2.1. *E. coli* RecBCD and RecJ...”

List of Symbols, Abbreviations

Page 10:

- “CARF - CRISPR-associated...” → “CARF – CRISPR-associated...”
- “Cas - CRISPR-associated” → “Cas – CRISPR-associated”
- “CRISPR – Clustered Regularly Interspaced Short Palindromic Repeats” → “CRISPR – clustered regularly interspaced short palindromic repeats”
- “CRISPR inteference ” → “CRISPR interference”
- “dNTPs – deoxynucleotides” → “dNTPs – deoxynucleotide triphosphates”
- “PBS – Phosphate-buffered saline” → “PBS – phosphate-buffered saline”

Chapter 1. Literature review.

Page 14:

- “...2) adaptive immunity (CRISPR-Cas systems) and 3) dormancy or programmed cell death...” → “2) adaptive immunity (CRISPR-Cas systems), and 3) dormancy or programmed cell death...”
- “G. G. Wilson, 1991” → “G. Wilson, 1991”

Page 16:

- “E. V. Koonin, 2017” → “Koonin, 2017”
- “Swarts, Makarova, et al., 2014” → “Swarts et al., 2014b”
- “Swarts, Jore, et al., 2014” → “Swarts et al., 2014a”

Page 22:

- “E. V. Koonin & Makarova, 2019” → “Koonin & Makarova, 2019”

Page 25:

- “(Faure et al., 2019; Peters et al., 2017; Shmakov et al., 2018) (Makarova et al., 2020)” → “(Faure et al., 2019; Peters et al., 2017; Shmakov et al., 2018; Makarova et al., 2020)”

Page 26:

- “Nam, Ding, et al., 2012” → “Nam et al., 2012a”
- “E. V. Koonin & Krupovic, 2015” → “Koonin & Krupovic, 2015”

Page 27:

- “In the Type I systems” → “In Type I systems”
- “Nam, Haitjema, et al., 2012” → “Nam et al., 2012b”

Page 29:

- “The resulting pre-crRNAs is cut...” → “The resulting pre-crRNAs are cut...”
- “(R. N. Jackson et al., 2014; Wiedenheft, Lander, et al., 2011)” → “(R. Jackson et al., 2014; Wiedenheft et al., 2011a)”
- “divided in 6 intervals” → “divided into 6 intervals”

Page 32:

- “Nuñez, Harrington, et al., 2015” → “Nuñez et al., 2015a”

Page 33:

- “Nuñez, Lee, et al., 2015” → “Nuñez et al., 2015b”

Page 38:

- “...DNA copy as a template (Figure 6).” → “...DNA copy as a template.”

Page 39:

- “H. W. Chen et al., 1997” → “H. Chen et al., 1997”
- “responsible for degradation of both strands” → “responsible for the degradation of both strands”

Page 40:

- “J. E. Wilson & Chin, 1991” → “J. Wilson & Chin, 1991”

Page 44:

- “F. P. Gibson et al., 1992” → “F. Gibson et al., 1992”
- “J. C. Connelly & Leach, 1996” → “Connelly & Leach, 1996”
- “J. Connelly, 1999” → “Connelly, 1999”
- “is rather explained” → “is explained”

Page 50:

- “Wiedenheft, Van Duijn, et al., 2011” → “Wiedenheft et al., 2011b”

Chapter 3. Materials and methods.

Page 57:

- “nonextended” → “unextended”

Page 63:

- “antibiotic activity” → “the antibiotic activity”
- “with average MBC/MIC ratio” → “with an average MBC/MIC ratio”

Chapter 4. Results.

Page 69:

- “... *ΔrecJ*, *ΔrecB ΔrecJ* and *ΔrecB ΔsbcD* mutants” → “...*ΔrecJ*, *ΔrecB ΔrecJ*, and *ΔrecB ΔsbcD* mutants”

Page 70:

- Figures 10, 11, 12, 13, and their description in the text were rearranged so that the numbering of the figures follows the order they are mentioned in the text: Figure 13 was placed on p. 70 and renamed to Figure 10. The numbers of other Figures and all corresponding references in the text were changed accordingly. The following part of the text was moved to page 71 and corrected:

“As in the parental, wild-type KD403 strain, induction of self-targeting in the mutants caused SOS response, as judged by cessation of culture growth (Figure 11), reduction in colony-forming units (Figure 12), and cell elongation (Figure 13), but did not increase the number of dead cells 5 h after the addition of *cas* genes inducers as judged by differential staining of live and dead cells (Figure 10B, 13).”

Page 73:

- “15% dead cells for *ΔrecJ ΔsbcD*” → “15% dead cells for *ΔrecB ΔsbcD*”

Page 81:

- “Data curation and the rest of the analysis was done...” → “Data curation and the rest of the analysis were done...”

Page 102:

- “Detection of the half-integrated prespacers...” → “Detection of half-integrated prespacers...”

Page 107:

- “replaces the RecJ function in its absence” → “replaces RecJ in its absence”

Page 123:

- “J. C. Connelly et al., 2003” → “Connelly et al., 2003”

Page 129:

- “S. A. Jackson et al.” → “S. Jackson et al.”
- “linked to bacterial host growth rate” → “linked to the bacterial host growth rate”

Conclusions.

Page 132:

- “The deletion of *recJ* decreases adaptation efficiency and affects accuracy...” → “The deletion of *recJ* decreases adaptation efficiency and the accuracy...”
- “ExoVII can partially substitute for RecJ activity during prespacer generation but produces slightly longer ends.” → “ExoVII can partially substitute RecJ during prespacer generation but produces slightly longer 5’ ends.”

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