

Radioresistant Bacteria of the Reed Research Reactor

---

A Thesis

Presented to

The Division of Mathematics and Natural Sciences

Reed College

---

In Partial Fulfillment

of the Requirements for the Degree

Bachelor of Arts

---

Kaitlyn Li

May 2022



Approved for the Division  
(Biochemistry and Molecular Biology)

---

Jay Mellies



# Acknowledgements

I want to thank a few people.



# Preface

This is an example of a thesis setup to use the reed thesis document class (for LaTeX) and the R bookdown package, in general.





# Table of Contents

<b>Chapter 1: If you have more two advisors, un-silence line 7 . . . . .</b>	<b>1</b>
1.1 Significance . . . . .	1
1.2 Radioresistant Spotlight . . . . .	1
1.3 The Reed Research Reactor . . . . .	1
1.4 So what am I doing here? . . . . .	1
<b>Chapter 2: Materials and Methods . . . . .</b>	<b>3</b>
2.1 Initial Isolation . . . . .	3
2.2 UV testing of isolates . . . . .	3
2.3 16S PCR Analysis . . . . .	3
2.4 Growth Rate Analysis . . . . .	3
2.5 Gram Staining . . . . .	3
2.6 DNA Sequencing Analysis . . . . .	3
<b>Chapter 3: Results . . . . .</b>	<b>5</b>
3.1 Radioresistance? Part 1 . . . . .	5
3.2 Growth Rates . . . . .	5
3.3 Radioresistance Part 2: electric bungalow . . . . .	5
3.4 Identification . . . . .	5
3.4.1 Gram Stains . . . . .	5
3.4.2 16S PCR . . . . .	5
3.4.3 Whole Genome Analysis of CM1 . . . . .	5
<b>Chapter 4: Conclusion . . . . .</b>	<b>7</b>
<b>Conclusion . . . . .</b>	<b>9</b>
<b>Appendix A: The First Appendix . . . . .</b>	<b>11</b>

<b>Appendix B: The Second Appendix, for Fun . . . . .</b>	<b>13</b>
<b>References . . . . .</b>	<b>15</b>

## List of Tables



## List of Figures



# Abstract

The preface pretty much says it all.

Second paragraph of abstract starts here.





# Dedication

You can have a dedication here if you wish.



# Chapter 1

If you have more two advisors,  
un-silence line 7

Placeholder

1.1 Significance

1.2 Radioresistant Spotlight

1.3 The Reed Research Reactor

1.4 So what am I doing here?



# Chapter 2

## Materials and Methods

Placeholder

### 2.1 Initial Isolation

### 2.2 UV testing of isolates

### 2.3 16S PCR Analysis

### 2.4 Growth Rate Analysis

### 2.5 Gram Staining

### 2.6 DNA Sequencing Analysis



# Chapter 3

## Results

Placeholder

### 3.1 Radioresistance? Part 1

### 3.2 Growth Rates

### 3.3 Radioresistance Part 2: electric bungalow

### 3.4 Identification

#### 3.4.1 Gram Stains

#### 3.4.2 16S PCR

#### 3.4.3 Whole Genome Analysis of CM1





# Chapter 4

## Conclusion

Placeholder



# Conclusion

If we don't want Conclusion to have a chapter number next to it, we can add the `{-}` attribute.

## **More info**

And here's some other random info: the first paragraph after a chapter title or section head *shouldn't be* indented, because indents are to tell the reader that you're starting a new paragraph. Since that's obvious after a chapter or section title, proper typesetting doesn't add an indent there.



# Appendix A

## The First Appendix

This first appendix includes all of the R chunks of code that were hidden throughout the document (using the `include = FALSE` chunk tag) to help with readability and/or setup.

**In the main Rmd file**

**In Chapter ??:**



# Appendix B

The Second Appendix, for Fun

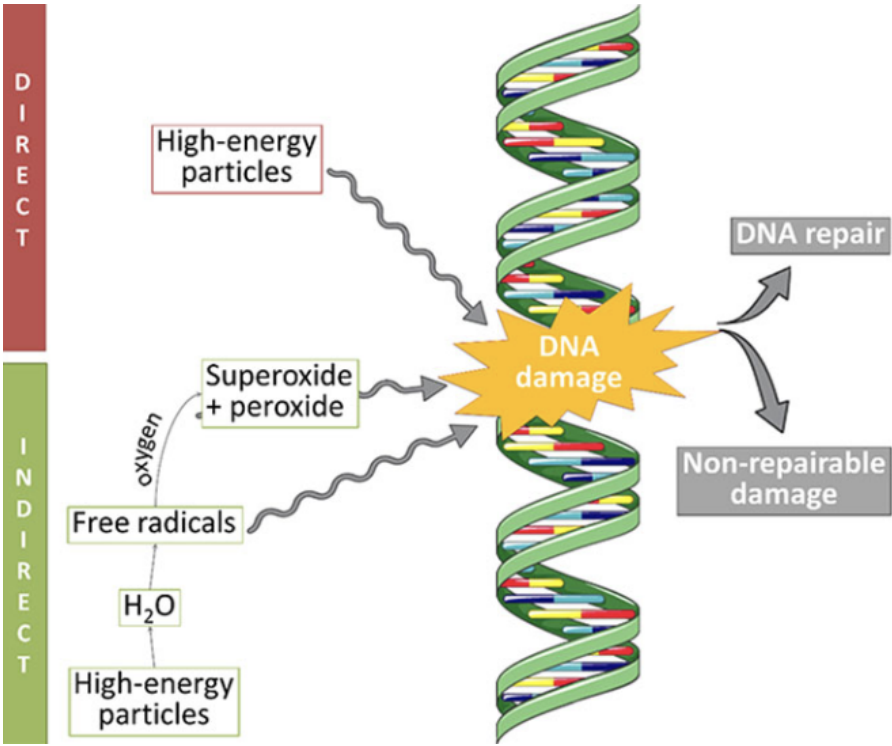




# References

Placeholder

$\text{H}_2\text{O} \longrightarrow \text{H}_2\text{O}^+ + \text{e}^-$	First water molecule is irradiated
$\text{H}_2\text{O}^+ \longrightarrow \text{H}^+ + \text{OH}$	Positive ion dissociates
$\text{H}_2\text{O} + \text{e}^- \longrightarrow \text{H}_2\text{O}^-$	Electron is picked up by water molecule
$\text{H}_2\text{O}^- \longrightarrow \text{H} + \text{OH}^-$	Hydronium ion dissociates
$\text{OH} + \text{OH} \longrightarrow \text{H}_2\text{O}_2$	Hydrogen peroxide is formed



\begin{figure}[t] \begin{center}

\caption[Interaction of radiation and DNA]{Interaction of radiation and DNA, adapted from Przystupski et al.(1), describes how high energy particles, which can be from radiation such as  $\alpha$ ,  $\beta$ , and  $\gamma$ , interacts with deoxyribonucleic acid.}

\end{center} \end{figure}

1. Przystupski D, Górski A, Rozborska P, Bartosik W, Michel O, Rossowska J, Szewczyk A, Drąg-Zalesińska M, Kasperkiewicz P, Górski J, Kulbacka J. 2019. The Cytoprotective Role of Antioxidants in Mammalian Cells Under Rapidly Varying UV Conditions During Stratospheric Balloon Campaign. *Frontiers in Pharmacology* 10.