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**TITLE OF YOUR THESIS OR DISSERTATION**

Author’s Full Name

A [ dissertation or thesis ] submitted to the faculty at the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of [ insert degree ] in the [ insert department or program name ] in the [ named school ].

Chapel Hill

20XX

Approved by:

Supervisor

Committee chair

Committee member 1

Committee member 2

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**ABSTRACT**

Author’s Name: Title of Thesis/Dissertation

(Under the direction of [Advisor’s Name])

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To my mentor and friend, I couldn’t have done this without you.

Thank you for all your support along the way.

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**ACKNOWLEDGEMENTS**

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**PREFACE**

If you are including previously published work in your thesis or dissertation, you may want to include information in the preface about the publication. You will include basic citation information in a footnote or endnote at the beginning of the chapter of previously published work. Additional information about the publication or research can be explained in your preface.

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# LIST OF ABBREVIATIONS AND SYMBOLS

|  |  |
| --- | --- |
| % | percent |
| °C | degrees Celsius |
| 13C | NMR carbon-13 nuclear magnetic resonance |
| 1H | NMR proton nuclear magnetic resonance |
| 5-TAMRA | 5-Carboxytetramethylrhodamine |
| Å | angstrom |
| apo | ligand-free |
| A-site | aminoacyl-site |
| ATCC | american type culture collection |
| avg | arithmetic average |
| cDNA | complementary DNA |
| cm | centimeter |
| con loop | consecutive loop |
| cryo-EM | cryogenic electron microscopy |
| cryo-EM | cryogenic electron microscopy |
| d | doublet |
| *D* | cluster distance (Å) |
| DCM | dichloromethane |
| dd | doublet of doublets |
| DFAME | 3-[4-(difluoromethyl)phenyl]-2-[(2-methylpropan-2-yl)oxycarbonylamino]propanoic acid |
| DFHBI | 3,5-difluoro-4-hydroxybenzylidene imidazolinone |
| DFHBI-1T | (Z)-4-(3,5-difluoro-4-hydroxybenzylidene)-2-methyl-1-(2,2,2-trifluoroethyl)-1H-imidazol-5(4 H)-one |
| DIPEA | N,N-Diisopropylethylamine |
| dis | distant long-range interaction |
| DMHBI | 3,5-dimethoxy-4-hydroxybenzylidene imidazolone |
| DMSO | dimethyl sulfoxide |
| DNA | deoxyribonucleic acid |
| DTT | dithiothreitol |
| EDC-HCl | N-Ethyl-N′-(3-dimethylaminopropyl)carbodiimide hydrochloride |
| eRMSD | estimated root mean square deviation |
| ESI-QTOF | electrospray ionization quadrupole time of flight |
| EtOAc | ethyl acetate |
| FMN | flavin mononucleotide |
| Frag | small molecule fragment |
| *g* | gravitational constant |
| G4 | G-quadruplex |
| HBC | benzylidene-cyanophenyl |
| HIV-1 | human Immunodeficiency virus-1 |
| HOBt | 1-Hydroxybenzotriazole hydrate |
| holo | ligand-bound |
| HRMS | high resolution mass spectrometry |
| Hz | Hertz |
| *i* | number of alpha spheres |
| *J* | coupling constant |
| J | joules |
| LSU | large ribosomal subunit |
| M | molar |
| *m* | minimum alpha sphere radius |
| *M* | maximum alpha sphere radius |
| m/z | mass to charge ratio |
| MaP | mutational profiling |
| Methanol-d4 | deuterated methanol |
| mg | milligram |
| MHJ | multihelix junction |
| MHz | megahertz |
| min | minute |
| mL | milliliter |
| mM | millimolar |
| mmol | millimole |
| mRNA | messenger RNA |
| MW | molecular weight |
| n | sample size |
| NEB | new england biolabs |
| ng | nanogram |
| NMR | nuclear magnetic resonance |
| nt | nucleotides |
| OD600 | optical density at 600 nm |
| PDB | protein data bank |
| pH | potential of hydrogen |
| PK | pseudoknot |
| pM | picomolar |
| PPDA | pyrimido[4,5-d]pyrimidine-2,4-diamine |
| ppm | parts per million |
| ppv | positive-predictive value |
| PreQ1 | pre-queuosine1 |
| P-site | peptidyl-site |
| PTC | peptidyl transfer center |
| PTLC | preparative thin layer chromotography |
| QED | quantitative estimate of druglikeness |
| RNA | ribonucleic acid |
| rpm | revolutions per minute |
| rRNA | ribosomal RNA |
| RT | reverse transcriptase |
| S | Svedberg unit |
| SAH | S-Adenosyl homocysteine |
| SAM | S-Adenosyl methionine |
| SASA | solvent accessible surface area |
| sens | sensitivity |
| SSU | small ribosomal subunit |
| TAL2 | theophylline aptamer ligand 2 |
| TAR | trans-activation response element |
| TBTA | tris(benzyltriazolylmethyl)amine |
| TLC | thin layer chromotography |
| TPP | thiamine pyrophosphate |
| Tris | tris(hydroxymethyl)aminomethane |
| tRNA | transfer RNA |
| TWEEN-20 | Polyoxyethylene (20) sorbitan monolaurate |
| UV | ultraviolet |
| YO3-biotin | oxazole yellow biotin |
| ZMP | 5-amino-4-imidazole carboxamide ribose-5′-monophosphate |
| δ | chemical shift |
| μg | microgram |
| μL | microliter |
| μM | micromolar |
| π-π | pi-pi interaction |

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# CHAPTER 1: TITLE OF CHAPTER 1

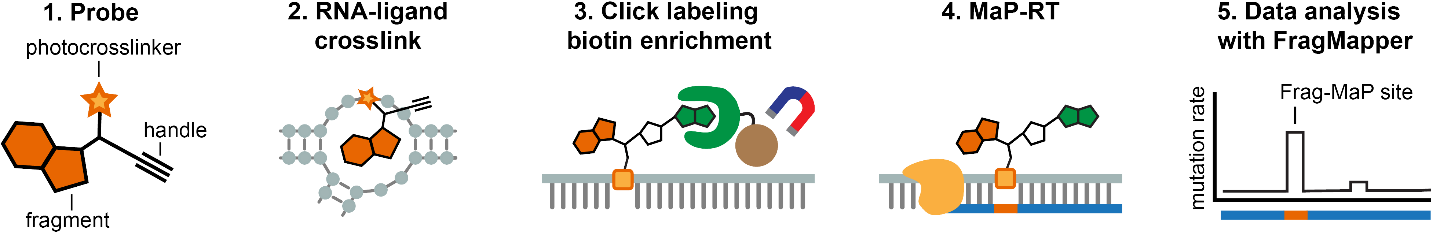
## Introduction

This chaper contains footnote references while chapter 2 contains endnote references. You must pick one style or the other and apply it consistently throughout. The sample pages include both styles to demonstrate formatting options only.

This page also illustrates how to include a note identifying that the chapter has been previously published and the source of publication.

## Section 1.1

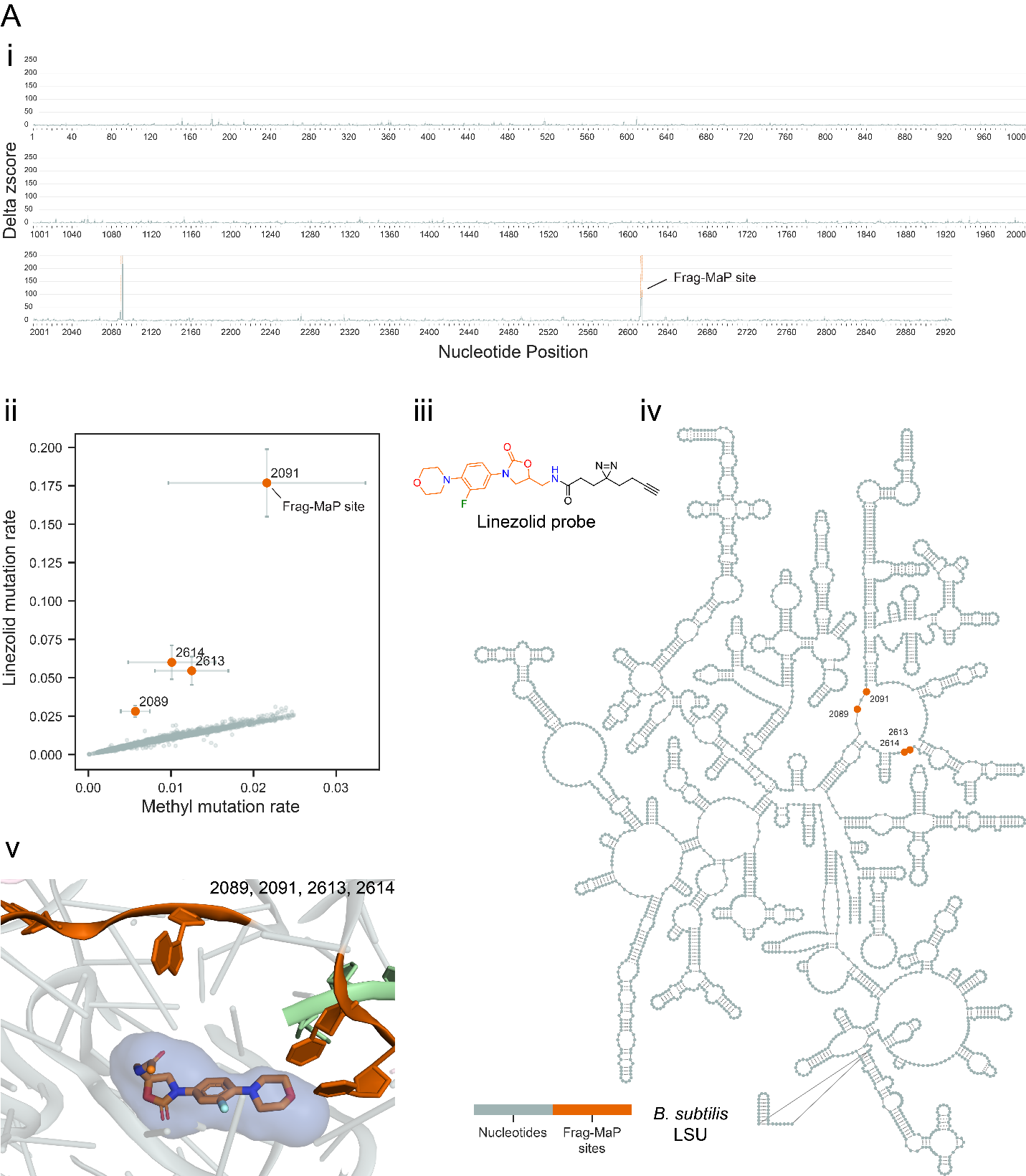
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**Figure 1.1. Scheme of Frag-MaP experimental procedure****.**

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**Figure 1.2. Frag-MaP sites identified in the *B. subtilis* 23S rRNA using the linezolid functionalized probes****.** For each panel: (*i*) Frag-MaP profiles displaying z-score of the difference in mutation rate between the fragment and methyl probes for each nucleotide. Frag-MaP sites analyzed in this work are depicted in orange. Frag-MaP sites at RNA-protein interactions or in structurally unvisualized regions, not analyzed in this work, are purple. Error is shown as the standard error of the mean. (*ii*) Comparison of the per-nucleotide mutation rate between the fragment and methyl probes. (*iii*) Structure of the functionalized fragment probe. (*iv*) Location of Frag-MaP sites (orange) within the secondary structure of the *B. subtilis* large subunit (LSU). (*v*) Proximity of Frag-MaP sites (orange) to pockets predicted by fpocketR (colored spheres) (PDB: 7AS8) (6).

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# CHAPTER 2: TITLE OF CHAPTER 2

## Introduction

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include both styles to demonstrate formatting options only.

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Table 2.1. CASP 15 results for R1189.

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| **Model** | **Group** | **RMSD** | **LDDT** | **TM\_score** | **GDT\_TS** | **Clashscore** |
| R1189TS444\_3 | CoDock | 26.39 | 0.531 | 0.288 | 22.88 | 0.00 |
| R1189TS131\_2 | Kiharalab\_Server | 26.44 | 0.53 | 0.281 | 22.67 | 6.53 |
| R1189TS494\_5 | Venclovas | 26.48 | 0.527 | 0.281 | 20.98 | 4.96 |
| R1189TS232\_4 | AIchemy\_RNA2 | 25.78 | 0.5 | 0.278 | 20.97 | 15.15 |
| R1189TS081\_1 | RNApolis | 20.32 | 0.542 | 0.276 | 22.46 | 12.54 |
| R1189TS147\_2 | SHT | 23.75 | 0.475 | 0.273 | 23.09 | 1.57 |
| R1189TS444\_4 | CoDock | 27.59 | 0.525 | 0.27 | 20.97 | 0.00 |
| R1189TS227\_2 | GinobiFold | 23.29 | 0.434 | 0.269 | 18.01 | 0.26 |
| R1189TS081\_2 | RNApolis | 18.7 | 0.534 | 0.262 | 18.86 | 10.45 |
| R1189TS035\_3 | Manifold-E | 24.87 | 0.521 | 0.261 | 22.88 | 14.36 |

# References