



Synthetic Biology: A Lab Manual

Josefine Liljeruhm

Download now

[Click here](#) if your download doesn't start automatically

Synthetic Biology: A Lab Manual

Josefine Liljeruhm

Synthetic Biology: A Lab Manual Josefine Liljeruhm

Synthetic Biology: A Lab Manual is the first manual for laboratory work in the new and rapidly expanding field of synthetic biology. Aimed at non-specialists, it details protocols central to synthetic biology in both education and research. In addition, it provides all the information that teachers and students from high schools and tertiary institutions need for a colorful lab course in bacterial synthetic biology using chromoproteins and designer antisense RNAs. As a bonus, practical material is provided for students of the annual international Genetically Engineered Machine (iGEM) competition. The manual is based upon a highly successful course at Sweden's Uppsala University and is coauthored by one of the pioneers of synthetic biology and two bioengineering postgraduate students.

An inspiring foreword is written by another pioneer in the field, Harvard's George Church:

“Synthetic biology is to early recombinant DNA as a genome is to a gene. Is there anything that SynBio will not impact? There was no doubt that the field of SynBio needed ‘A Lab Manual’ such as the one that you now hold in your hands.”

Contents:

- ***Introduction:***

- What is Synthetic Biology, Exactly?
- The iGEM Outbreak
- A Synthetic Biology Lab Manual

- ***Genes, Chromoproteins and Antisense RNAs:***

- *E. coli* DNA: Chromosomes, Plasmids and Copy Number
- Coupling of Transcription and Translation in Bacteria
- Promoter and Terminator for Transcription
- Ribosome Binding Site (RBS)
- Codon Bias
- Chromoproteins
- Small Regulatory RNAs (sRNAs)

- ***Lab Rooms and Equipment:***

- The Physical Lab Spaces
- Equipment

- ***Safety is Priority #1:***

- Fires
- Chemicals
- Biological Safety and Disposal
- Dangerous Equipment

- ***Lab Course Projects:***

- Time and Resources
- Project Overview and Learning Objectives
- The Lab Notebook
- Lab Section 1. Preparation of Chemical Solutions and Agar Plates
- Lab Section 2. Coloring Bacteria by Adding a Promoter to a Chromoprotein Gene
- Lab Section 3: Rational Engineering of Chromoprotein Expression Level

- Lab Section 4. Other Experiments

- The “Dreaded” Exam

- **Protocols:**

- Introduction
- Protocol 1. Preparation of Solutions and Agar Plates
- Protocol 2. Overnight Cultures with Antibiotics, and Glycerol Stocks
- Protocol 3. BioBrick™ 3A Assembly and Gel Analysis
- Protocol 4. Agarose Gel Electrophoresis
- Protocol 5. Preparation of Competent *E. coli* Cells Using CaCl₂
- Protocol 6. Transformation of CaCl₂-Competent *E. coli* Cells
- Protocol 7. Bacterial Re-Streaking Techniques
- Protocol 8. Lysis of *E. coli* Cells with Lysozyme
- Protocol 9. Polymerase Chain Reaction (PCR)
- Protocol 10. Inverse PCR Mutagenesis
- Protocol 11. Colony PCR
- Protocol 12. Gibson Assembly

- **Advanced Methods:**

- Flow Cytometry and Cell Sorting
- Recombination in Plasmids and the Chromosome
- Electrocompetent Cells

- ***The International Genetically Engineered Machine (iGEM) Competition:***

- How to Start an iGEM Team
- Uppsala iGEM 2011 — Show Color with Color
- Uppsala iGEM 2012 — Resistance is Futile
- Uppsala iGEM 2013 — Lactonutritious — It's Delicious

- **Appendices**

Readership: Students and researchers in biotechnology, cell/molecular biology and genetics.

 [Download Synthetic Biology:A Lab Manual ...pdf](#)

 [Read Online Synthetic Biology:A Lab Manual ...pdf](#)

Download and Read Free Online Synthetic Biology:A Lab Manual Josefine Liljeruhm

From reader reviews:

William Duhon:

Do you one of people who can't read pleasant if the sentence chained from the straightway, hold on guys this aren't like that. This Synthetic Biology:A Lab Manual book is readable through you who hate the perfect word style. You will find the facts here are arrange for enjoyable reading through experience without leaving perhaps decrease the knowledge that want to offer to you. The writer associated with Synthetic Biology:A Lab Manual content conveys thinking easily to understand by lots of people. The printed and e-book are not different in the information but it just different by means of it. So , do you even now thinking Synthetic Biology:A Lab Manual is not loveable to be your top checklist reading book?

Carroll Boggess:

Synthetic Biology:A Lab Manual can be one of your beginner books that are good idea. Most of us recommend that straight away because this reserve has good vocabulary that will increase your knowledge in words, easy to understand, bit entertaining however delivering the information. The author giving his/her effort that will put every word into satisfaction arrangement in writing Synthetic Biology:A Lab Manual yet doesn't forget the main place, giving the reader the hottest in addition to based confirm resource facts that maybe you can be one among it. This great information can drawn you into brand-new stage of crucial pondering.

Henry Woods:

You may get this Synthetic Biology:A Lab Manual by browse the bookstore or Mall. Merely viewing or reviewing it can to be your solve difficulty if you get difficulties to your knowledge. Kinds of this reserve are various. Not only simply by written or printed but can you enjoy this book through e-book. In the modern era just like now, you just looking because of your mobile phone and searching what your problem. Right now, choose your ways to get more information about your reserve. It is most important to arrange you to ultimately make your knowledge are still revise. Let's try to choose suitable ways for you.

Michael Hale:

Book is one of source of knowledge. We can add our expertise from it. Not only for students but in addition native or citizen require book to know the update information of year to be able to year. As we know those guides have many advantages. Beside we all add our knowledge, can bring us to around the world. By book Synthetic Biology:A Lab Manual we can consider more advantage. Don't you to definitely be creative people? To get creative person must choose to read a book. Just choose the best book that suited with your aim. Don't become doubt to change your life with that book Synthetic Biology:A Lab Manual. You can more appealing than now.

**Download and Read Online Synthetic Biology:A Lab Manual
Josefine Liljeruhm #VUYFCEO3GTL**

Read Synthetic Biology:A Lab Manual by Josefine Liljeruhm for online ebook

Synthetic Biology:A Lab Manual by Josefine Liljeruhm Free PDF d0wnl0ad, audio books, books to read, good books to read, cheap books, good books, online books, books online, book reviews epub, read books online, books to read online, online library, greatbooks to read, PDF best books to read, top books to read Synthetic Biology:A Lab Manual by Josefine Liljeruhm books to read online.

Online Synthetic Biology:A Lab Manual by Josefine Liljeruhm ebook PDF download

Synthetic Biology:A Lab Manual by Josefine Liljeruhm Doc

Synthetic Biology:A Lab Manual by Josefine Liljeruhm MobiPocket

Synthetic Biology:A Lab Manual by Josefine Liljeruhm EPub