Human Practice Report
Paris Bettencourt 2012 iGEM Team

Preface

Introduction

I Debate on the technique

A. Historical background: Synthetic biology as an extension to Genetic Engineering

1. Definitions: synthetic biology and genetic engineering

i. Synthetic biology

iii. Comparison between Synthetic Biology and Genetic engineering

2. SB and Genetic engineering share a common history and so common controversies around the recombinant DNA technology.

i. Beginnings

ii. Asilomar

iii. What happened next

iv. Analysis

B. Concerns raised by Synthetic Biology

1. Recombinant DNA technology

2. Synthetic Biology: Awareness, perceptions, concerns and regulation

i. Awareness of synthetic biology

ii. Perception of Synthetic Biology

iii. Concerns about Synthetic Biology

iv. Approval of synthetic biology

v. Who should regulate synthetic biology and what should be taken into accounts when making guidelines and laws?

3. Analysis of the concerns raised by synthetic biology

i. Unnaturalness

ii. Playing God

iii. Status of artificial life

iv. Physical harms

v. Regulations

4. Will rising awareness change anything?

i. Polls have shown that skepticism is not simply caused by lack of information

ii. We disagree with the finality of educating on new technologies so the population can accept them better

C. Conclusion

II. The debate about putting GM bacteria in the environment

A. Our master security system

1. Horizontal gene transfer

i. What is horizontal gene transfer?

ii. Since when have people been concerned about HGT

iii. Why is risk so hard to access?

2. Excessive proliferation

3. Biosafety: how are these concerns about excessive proliferation and HGT dealt with?

i. Governing Instances

ii. Literature

iii. Screening past iGEM projects

4. How our system tries to come as a response to these issues

i. Recap of what our team thinks

ii. Presentation of our system

iii. Is decreasing the probability enough?

B. Are these issues the only concerns?

1. Case study: GMO plants and crops

i. Historical background [36, 37,38]

ii. The polemic in Europe

iii. Lessons to be learned

2. Applying these lessons to synthetic biology & further suggestions

C. Conclusion

Conclusion: Contributions & Proposals

Bibliography