

# **Ethics for Synthetic Biology**

**Guidelines for the iGEM Community**

Team BIOSINT México 2015

## **Overview**

Synthetic biology, as a relatively new science, gains relevance every day and becomes more and more important while attracts the attention of the general public, the government and politicians, given the positive and recognized effects it has in economics, health, science and social well being.

As synthetic biology keeps getting bigger and reaching new horizons in the knowledge of what can be done, a lot of questions keep being raised, many of them, concerning the rightness and integrity of what is being made nowadays in this field. Sadly, since the questions are new everyday, it is impossible to answer all of them specifically, however, it is possible to create a resource that provides some guidelines regarding this topic.

As an emerging field, synthetic biology needs the conformation of a set of workable standards that ensure the good practices regarding safety and ethics. This document is presented as a support material for the scientific community involved in synthetic biology, with the purpose to be used as a guideline in the situations that may have moral and ethical implications.

All of the organizations that are voluntarily subscribed to this code, recognize and compromise to fully comply with the precepts here established. The present code is designed to help the synthetic biology community to identify relevant considerations when professional duties transcend or ethical uncertainties arise.

## Background

Considering that:

- Synthetic Biology (SynBio) is a relatively novel science which has the objective of improve the development of the human race through the development of new technologies by using different techniques of Molecular Biology,
- SynBio, as any other science, is in a state of constant change, because of the fast development of the knowledge led by the increasing amount of people working hard in different parts of the world,
- Every year, more people turn his interest to this "new" field of knowledge and start collaborating in order to contribute to the steady growth of it,
- The iGEM community represents the vast majority of scientist, teachers, scientifics, enterprises, governmental and non-governmental institutions, and civilians interested and participating in the development of this science,
- The iGEM community keeps growing every year with every edition of the competition,
- To this day, there is not a Code of Ethics generally accepted by the SynBio related population, but people are forced to take advice other Ethic Codes and Ethical Guidelines, of related sciences, and adjust it to their necessities.

We, the iGEM Team BIOSINT México 2015, decided to redact the present document as a guideline for the iGEM Community, present and future teams, and people related to SynBio; to work with and to serve as a reference when working in a project that may have ethical implications.

Also, we have considered to write about the participation of the iGEM Community in the everyday society, by suggesting in the last points of the present, a conduct code for all the iGEM team members, an approximation to the ethical implications of the Policy and Practices Subproject, and the duties of the iGEM community in the society.

## **General principles of the Code**

As the community of SynBio, we recognize the following principles:

- Integrity – Complete adherence to moral and ethical principles, respecting the truth and valuing incorruptibility.
- Beneficence and Non-maleficence – Our actions are directed towards achieving the greater good, in order eliminate the damage that can be caused or reducing it to a minimum.
- Respect for People – Treat everyone with dignity and respect their rights, whether they are colleagues, clients or people outside the research environment, recognizing and guaranteeing their free choice.
- Respect for the law and system of government – Complying with relevant laws and standards, fostering public participation and transparency in the decision making.
- Justice – Recognize the right of every person to benefit from the development of SynBio and compromise to prefer and choose the community interests over the personal.
- Care and protection – Ensure the proper treatment of animals and nature, recognize its rights and seek the welfare of all the research subjects.

Having regard to these fundamental principles, and the conduct outlined in this Code, we will pursue biotechnology activities with potential to improve human health, enhance quality of life, support the environment (by observing the precautionary principle, preserving ecosystem health and biodiversity), and promote sustainable agriculture, industry and the development of new ways of expressing different forms of art, painting and sculpturing.

## **Precepts**

We recognize and agree to the following undertaking:

- **Professionalism and integrity**

To compromise to create awareness of the code in our labs, schools or organizations, as so, to the other guidelines relevant to the ethics and Bio-Safety in SynBio.

To ensure the good practices inside and outside the lab, school or organization, regarding the adequate realization of the procedures.

To maintain and report accurate lab results.

To encourage full honesty and incorruptibility in all the members of the lab, school or organization.

To repudiate the makeup of data, analysis and or experimental procedures.

To create bonds between ourselves and the respective authorities, advisory bodies and governments, in order to work together and legitimize our activities regarding ethics.

To encourage the creation and/or maintenance of an Ethical Committee inside our lab, school or organization, to debate and decide over ethical issues not (treated) in this code.

To entitle the Ethical Committee to advise over our procedures or actions regarding the ethical issues they may present.

To not proceed with our actions where the risk overpass the potential benefits, or our actions are not approved by the respectives authorities and the Ethical Committee.

To encourage the proposal of politics oriented to ease the work, funding, sharing, publishing and commercializing products regarding SynBio.

- **Responsibilities and Conflict of Interests**

To entitle the Ethical Committee to solve conflicts or potential conflicts of interest.

To discourage the staff to look after their personal interest and guide them to the realization of the importance of the common well.

To take the adequate steps in order to solve any problems that may happen between we and any organization we are affiliated or working for, regarding conflicts between their demands and the ethical principles exposed in the present Code.

To encourage all the staff in our labs, schools or organizations to talk to the Ethical Committee before taking any decision regarding ethical issues of the procedures.

- **Open source technology and Access to information**

To recognize the right of every research group to maintain, disseminate, store, retain and dispose of records and data relating to their professional and scientific work.

To recognize the accessibility as a basic characteristic of SynBio.

To inform and ask for consent when using technologies, resources and any kind of knowledge from the author(s) of the forementioned.

To encourage our lab, school or organization to share the information with whoever needs it.

To fully recognize/reference/credit the original authors when their research or a part of it, is used in our procedures.

To encourage the contribution between labs in order to improve the existent technology or knowledge regarding SynBio.

To create awareness of the different Licences existing regarding the lab work, documentation and publishing in SinByo.

- **Confidentiality and plagiarism**

To fully comply with the responsibilities for obtaining, protecting and storing any kind of information, issued by the lab, school or organization.

To follow the same principles and those required for any company/enterprise while working in sponsored research.

To inform, both the staff and the sponsoring organizations about the confidentiality politics followed.

To follow and adhere to the regent rules and laws of the country/state regarding this issue.

To try and minimize the risk while sharing information by any method, whether it is physically, electronically or samples.

- **Dishonesty and deception**

To share truthful, adequate and verifiable information to anybody requesting it.

To refrain of committing and report malpractices such as making-up, falsifying, misrepresent or alter experimental data.

To discourage the share of misleading information, whether it could or could not cause any potential harm to nature or human beings.

To take the adequate actions when acts of dishonesty are observed/detected and refer them to the Ethical Committee.

- **Misuse of technology and knowledge**

To compromise to under any circumstances, follow any procedure that could have harmful consequences to any individual.

To discourage people to participate in any activity that is not directed into making a beneficial contribution to the human kind or the environment.

To acknowledge that the conservation of the environment and the nature goes high above any personal or corporate interest.

To never use SynBio as a way to develop or manufacture biological weapons and discourage anyone to do so.

To never take part in any warfare or terrorist act that may result in the misuse of SynBio

To fully comply with the regulations and international treaties regarding bioweapons and biological agents.

To encourage the SynBio community to safeguard and protect any biological agent that may lead to a misuse of the technology.

To try and minimise any potential damage that may cause or result as a consequence of any SynBio research.

To take the proper safety measures to avoid any undesirable gene transportation that may affect directly to endemic species.

- **Transparency**

To encourage the approach of the staff to the research in an unbiased attitude, in order to ensure the truth and reliability of the collected information.

To endeavour to accomplish the public trust of SynBio and SynBio community by approaching the government, corporate sponsors, media and public with the right attitude.

To share the knowledge properly, in an honest way, and open to new ideas.

- **Intellectual property**

To fully comply with the current regulation/legislation of the nations/states and guarantee its rights over the natural resources.

To not participate, discourage people to, and not assist other parties in acts such as biopiracy.

To recognize the rights the nature, populations and ancestral knowledge when working in bioprospecting.

To respect, adhere to and fully comply with the current laws of the country/state regarding intellectual property



To encourage researchers to register their research as free access information.

- **Conduct, public and social participation**

To encourage SynBio community to acknowledge the population needs and develop solutions regarding social issues that affect directly the community that we live into.

To never behave in such a way that could harm the public trust and perception of the scientific community of SynBio

To not permit private conduct to interfere with the ability to fulfill our professional responsibilities.

To facilitate informed participation by the public in shaping policies related to SynBio and solving doubts and dilemmas the community may have.

To involve in public participation in the community and in politics, in such a way the whole community gets benefited by this actions