Guidelines for iGEM world map abstracts

We would love to present your ideas to the broad public in a clearly arranged manner. Thus we'd like to ask you to write your abstracts in a way that is easy to understand – especially for people that lack an academic background in natural sciences.

These abstracts will be shown on a world map on our wiki. So everybody can get an quick overview of the participating teams and their great projects.

To ease this task, we provide you with the guidelines below. Also, we hope that this could become an ongoing process for future iGEM competitions. In this sense, feel free to give us feedback on the guidelines or the idea in general.

These are the guidelines:

1. Write the abstract once in English and once in your mother tongue.
2. Use the following logical order:
    a) The current state of research.
    b) The problem that your project is tackling.
    c) Your solution.
    d) What are the benefits of your project to society?
    e) Outlook and/or results
3. Avoid scientific terminology if possible.
4. Try to avoid not common abbreviations (DNA is ok, that is common).
5. Keep the sentences as short as possible.
6. Try to avoid awkward looking numbers.
7. While writing imagine a specific person of the target group and try to explain it to her/him (in your mind).
8. Let a person of the target group read the abstract and make corrections accordingly.
9. Additionally, pictures make complicated topics easier to understand. So you are welcome to provide us with an easy to understand graphical abstract/explaining picture. Just make sure it is not childish.

On the next page, you will find our own abstract as an example.

1. Our **original** abstract:

Engineered genetic circuits have reached high complexity levels. These developments require transformation with more than one plasmid which in turn demands the simultaneous use of different antibiotics. Our aim is to enable transformation with multiple plasmids and just one antibiotic to minimize side-effects. In our study we describe novel RNA-based approach that allows for selection of several plasmids with only one antibiotic. The strategy is based on toehold switches that easily and reliably introduce a complex AND-logic to our design, thus enabling the selection of bacteria with all required plasmids. Our new method shows clear advantages: it increases cell growth and decreases stress, pushing forward the boundaries of synthetic biology.

2. The **easy** to understand version:

We can equip bacteria with new metabolic abilities by supplying them with new genes of interest, i.e. small pieces of DNA. To monitor which single cell from the bacterial consortium has actually taken up this gene of interest, we couple it with a marker. Commonly, the markers are genes encoding antibiotic resistances enabling bacteria to grow on antibiotics which normally kill them. Thus, survivors in the bacterial consortium are those that have taken up the gene of interest along with the antibiotic resistance gene. Often we need to supply more than one gene of interest to acquire certain complex new activity in bacteria. Until now, every single gene is complemented with its own marker (antibiotic resistance gene) for selecting survivors. Too many antibiotics, despite the resistance genes, put bacteria under enormous stress, so that the number of survivors is limited. We developed a novel tool that enables bacteria to take up several genes, or several pieces of DNA, with just overall one additional gene for antibiotic resistance. We had locked the resistance gene behind a “gate” so that only the first gene of interest is directly connected to it, while the other genes of interest are supplied with little “DNA keys” to unlock and access the same antibiotic resistance. So only those equiped with all keys are able to survive with antibiotics. Through this clever mechanism bacteria grow healthier with a single antibiotic, are better controllable and produce multiple products of interest.

3. We decided to explain a little about **synthetic biology** at the top, so that there is a basic level of knowledge to build on. The following will be shown above the map:

DNA is the blueprint of the cell, similarly to the architectural plan for a house, yet much more complex. DNA holds the information on how the cell is build, but it defines also the wire of functional connections in the cell to enable growth and replication.
The DNA, or the genetic information of the cell, encodes for proteins, which are the tiny household molecular robots that carry out a plethora of tasks. Some of them participate in building the cell, others break down nutrients for energy production enabling the cell to grow, or take the cellular trash out. The cell has several thousand variants of these molecular robots and each of them fulfills a unique function.
Bacteria are very adaptive as they have to survive harsh conditions. Naturally they can take up new pieces of DNA which enables them to acquire new functionalities and adapt to new conditions. This bacterial property is used in science to equip bacteria with new activities and produce products with useful practical applications, i.e. therapeutics, food additives, biodegradable plastics. The man-tailored alterations of bacterial blueprints (DNA) occur through so called transformations, which describe an approach to bring new pieces of DNA or new genes into bacteria. For example, a piece of DNA can be introduced into the bacterial cell, which contains the blueprint for insulin production, so that bacteria can be turned into a factory producing this valuable therapeutic for treating diabetes. Synthetic biology uses approaches to introduce new activities in bacteria and repurpose them for producing useful products.