Steady increase of proteins in therapy and diagnostics

* Billions of CHF, in 2012
Source: Roche
Requirements for antibodies useful to therapy and diagnostics

- Ensure the correct posttranslational modification
- Complex proteins (e.g. folding, disulfide bridge pattern)
- Low production costs (with a perspective to Third World)
- Easy production in large scale
- Easy, efficient and reliable purification scheme
What are the limitations of current production systems?
There is an alternative: Microalgae!

Phaeodactylum tricornutum
Microalgae have a number of advantages
Microalgae have a number of advantages

\[ \vec{a} \times \vec{b} = \begin{pmatrix} a_x \\ a_y \\ a_z \end{pmatrix} \times \begin{pmatrix} b_x \\ b_y \\ b_z \end{pmatrix} = \begin{pmatrix} a_y b_z - a_z b_y \\ a_z b_x - a_x b_z \\ a_x b_y - a_y b_x \end{pmatrix} = \begin{pmatrix} c_x \\ c_y \\ c_z \end{pmatrix} \]
Our approach: Milestones

Different BioBricks were contributed to the Registry and we hope that future iGEM teams will use PHAECTORY as a chassis!
The PHAECTORY is up’n running! (Testcase: Hepatitis B antibody)

→ Nitrate reductase promoter was used
Lightcontrol: Establishing a light-inducible promoter
Lightcontrol:
Establishing a light-inducible promoter
Directing functionalities to the membrane
We offer you a toolbox for our new chassis:

Now it is your turn to leverage PHAECTORY!
iGEM was more then just research!
Day of Synthetic Biology
Extracting DNA from sweet pepper
Spreading the world of Synthetic Biology
Safety first

Nature

PHAECTORY
Safety first

Step 1
- LITE1
- Weak promoter
- Active

Step 2
- TALE1 binding site
- LITE2
- Active
- Protease K
- DNase I
- Active

LITE1:
- TALE1
- CRY2
- CIB1
- TF bZIP

LITE2:
- TALE2
- CRY2
- CIB1
- TF bZIP
Thank You
Antibody secretion in PHAECTORY
Establishing a light-inducible promoter

![Diagram of light-inducible promoter](image)

- Light
- Promoter
- eGFP
- anti-eGFP
- Optical Density Graphs:
  - Normalization optical density
  - Normalization whole protein extract

![Bar graphs showing GFP values](image)