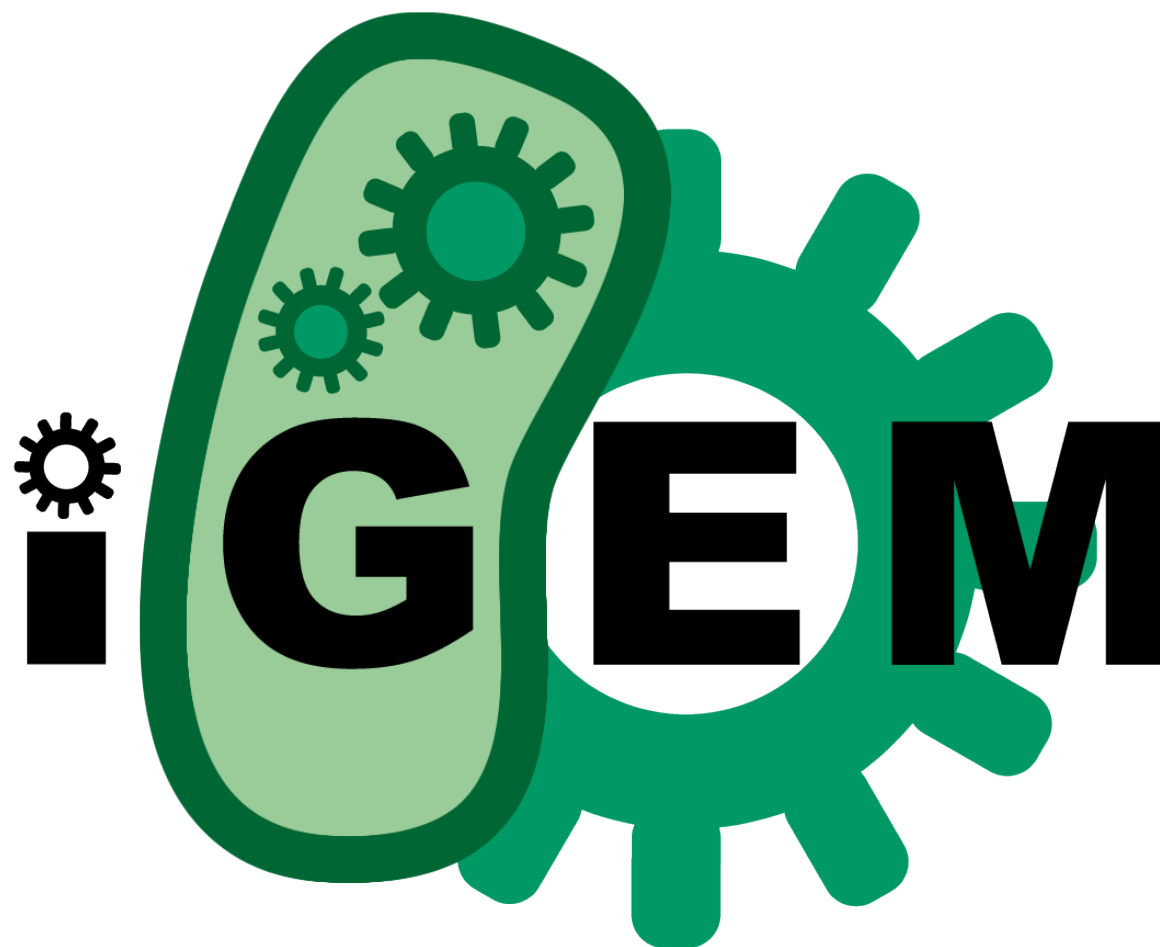




Inhoud

Wat is DNA?

Wat is een bacterie?

Bacteriën in het labo

Wat is synthetische biologie?

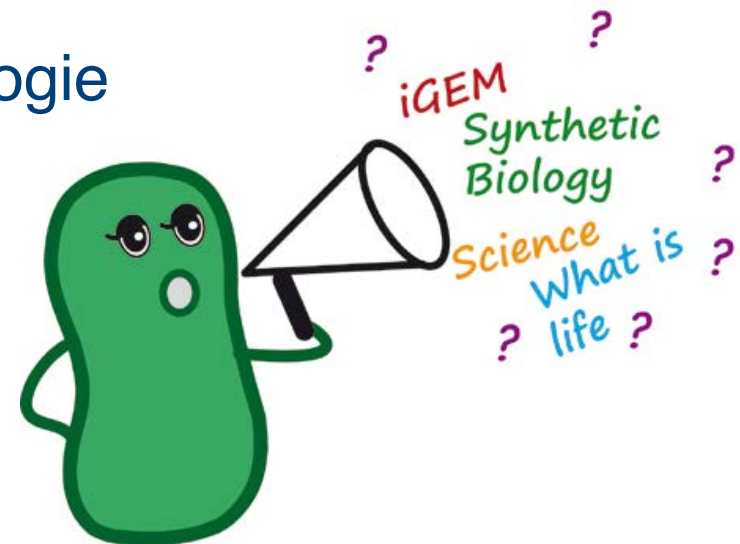
Mogelijkheden van synthetische biologie

KU Leuven iGEM 2013

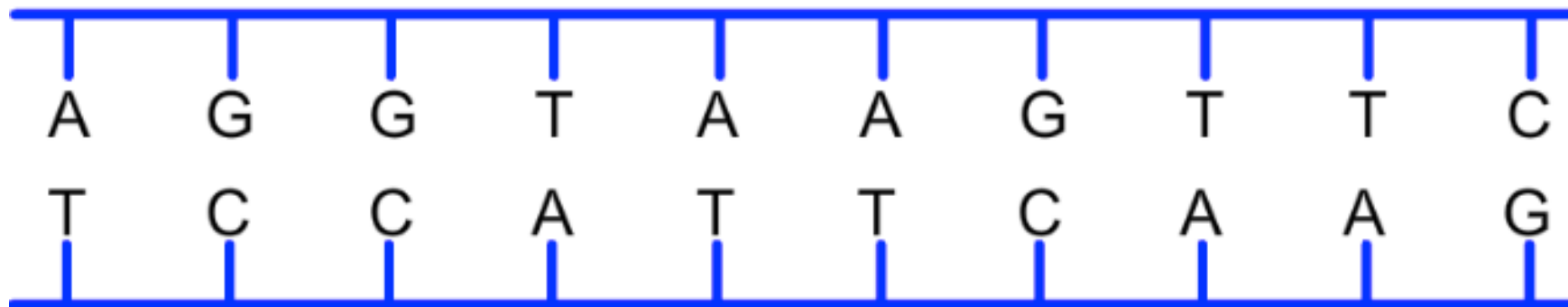
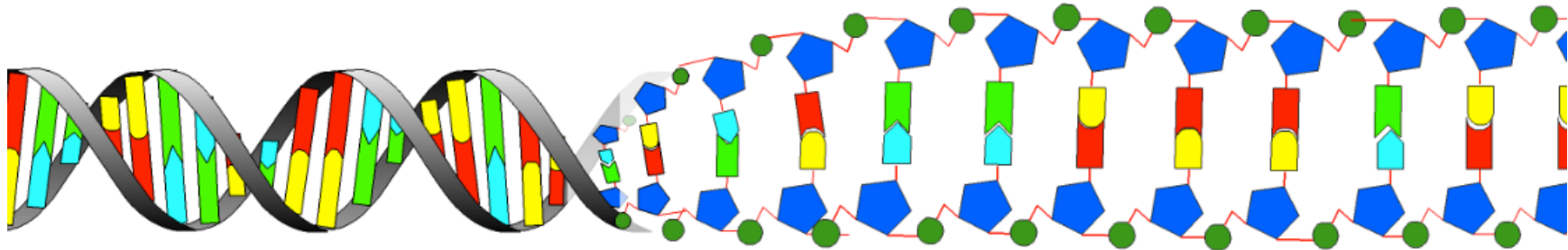
Maatschappelijk belang

Oefeningen

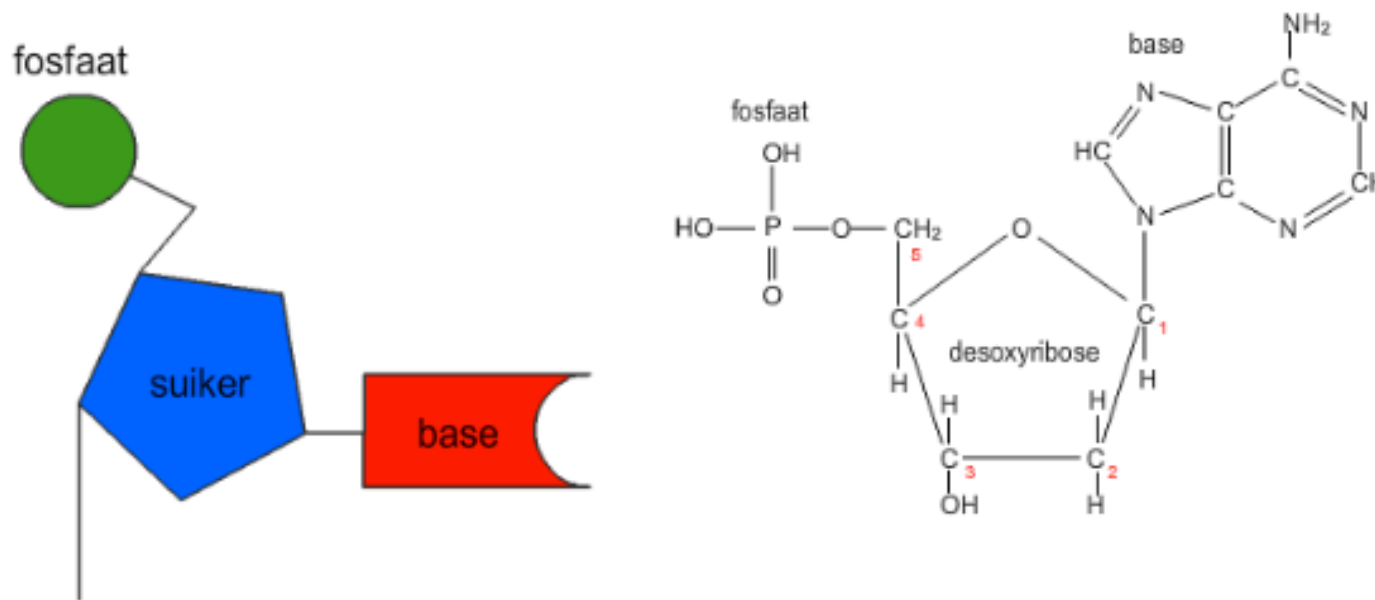
Experiment



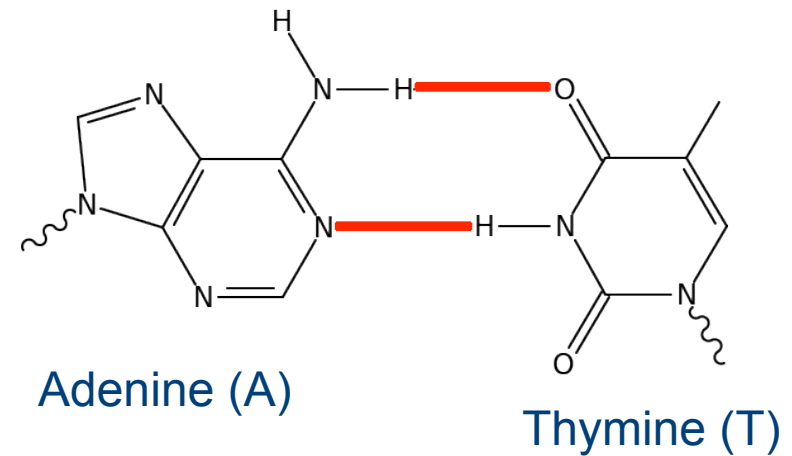
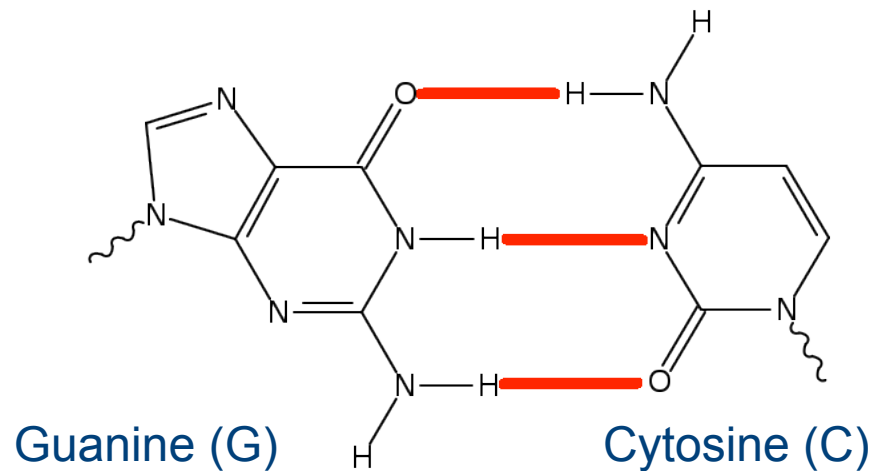
Wat is DNA?



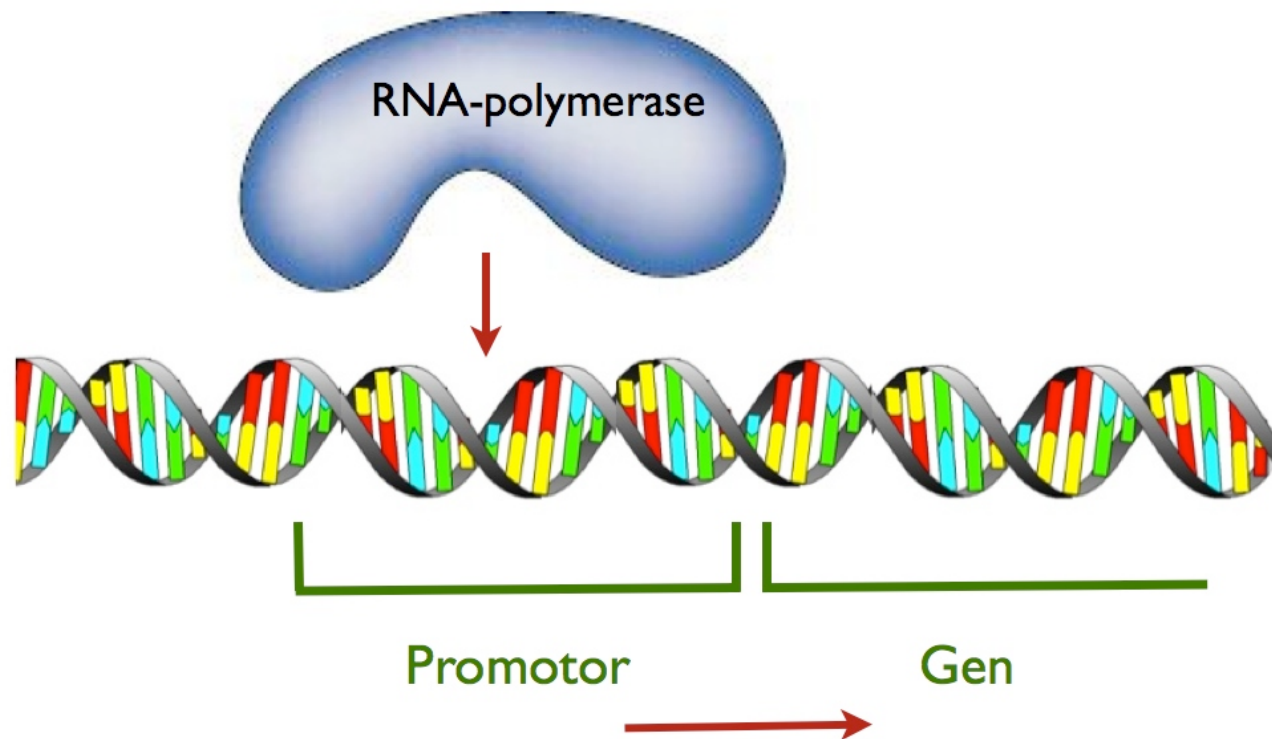
Bouwstenen van DNA: nucleobasen



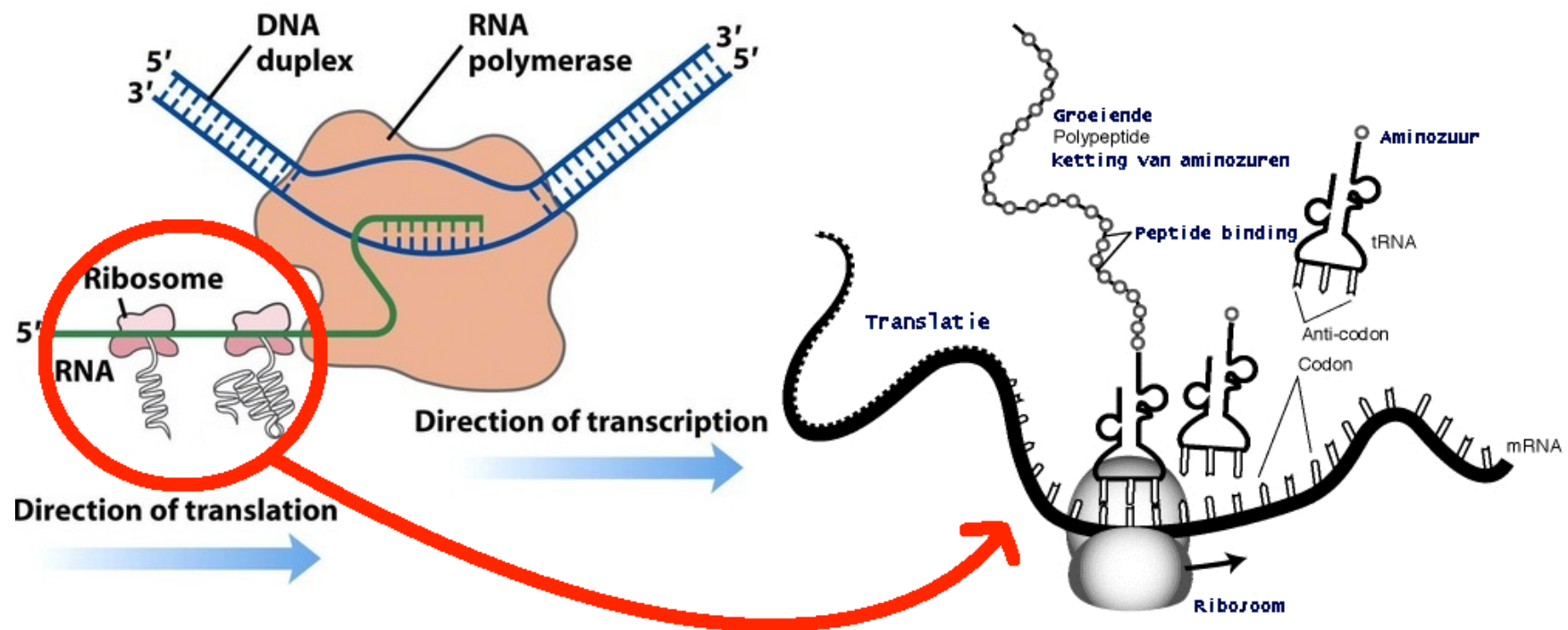
Bouwstenen van DNA: nucleobasen



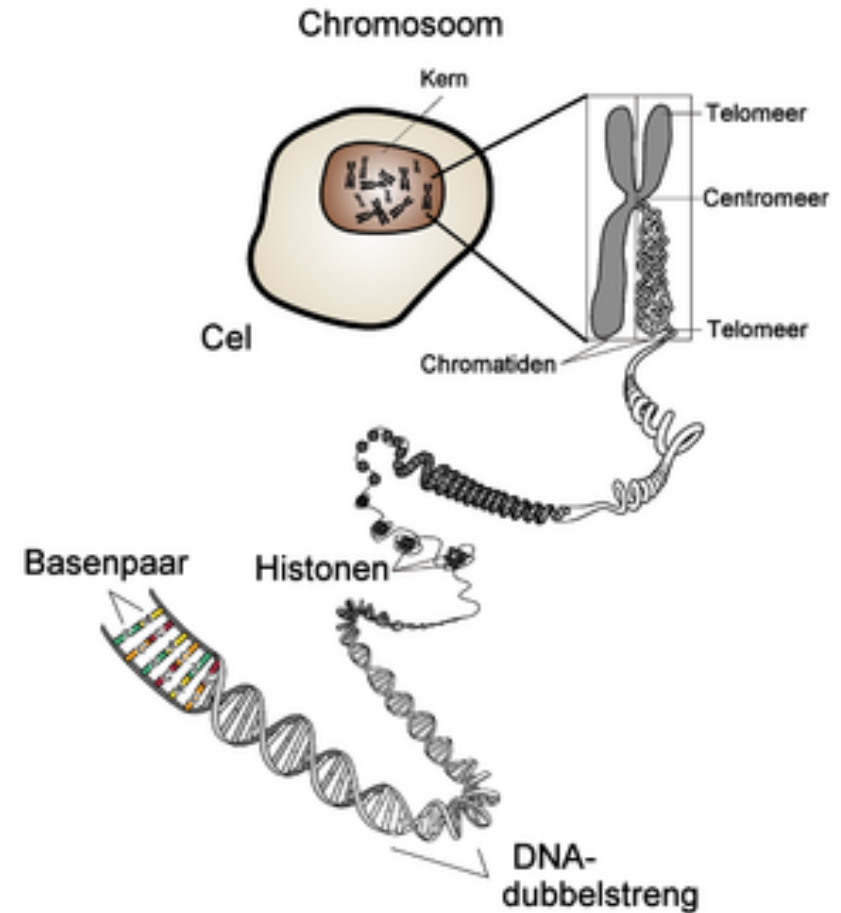
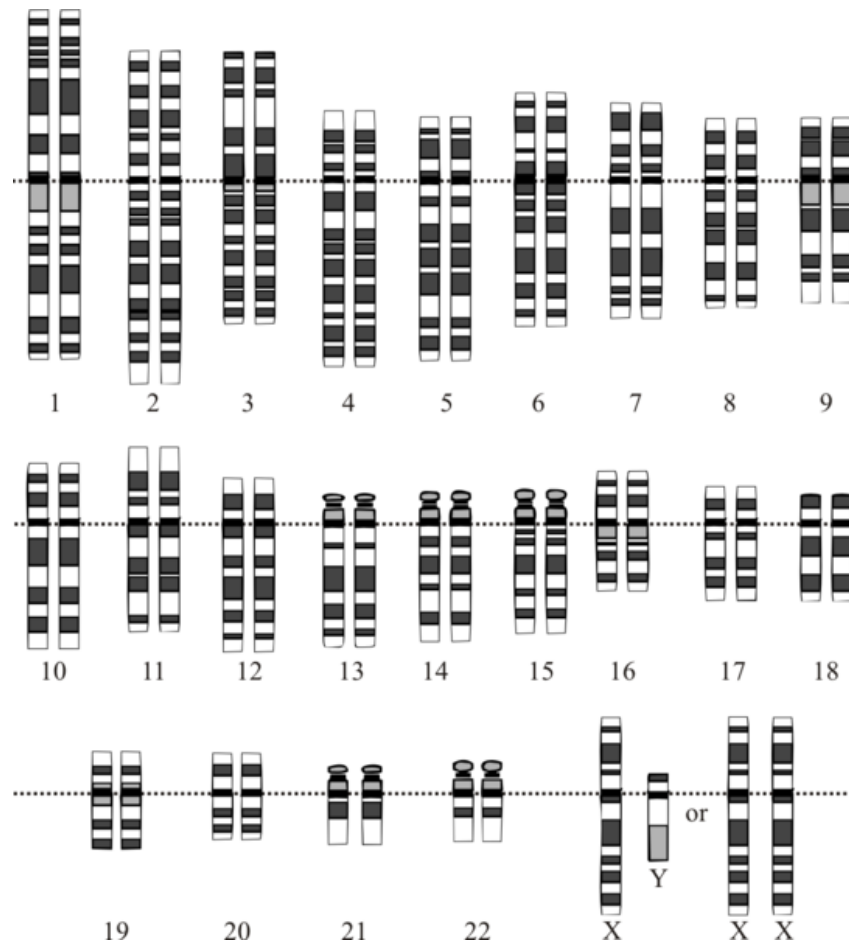
Transcriptie van DNA naar RNA



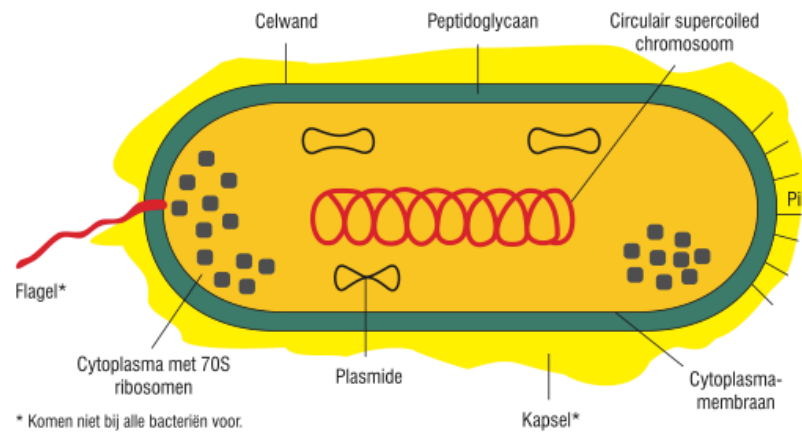
Translatie van RNA naar proteïnen



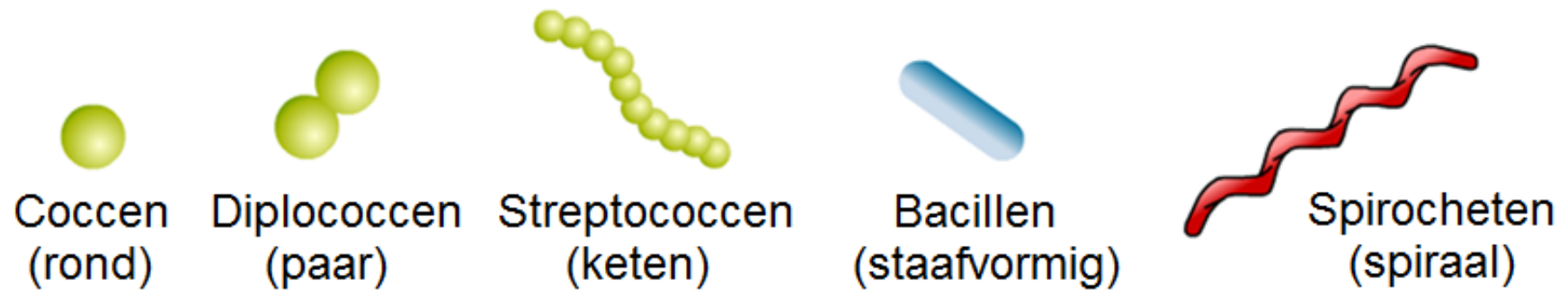
Menselijke genoom



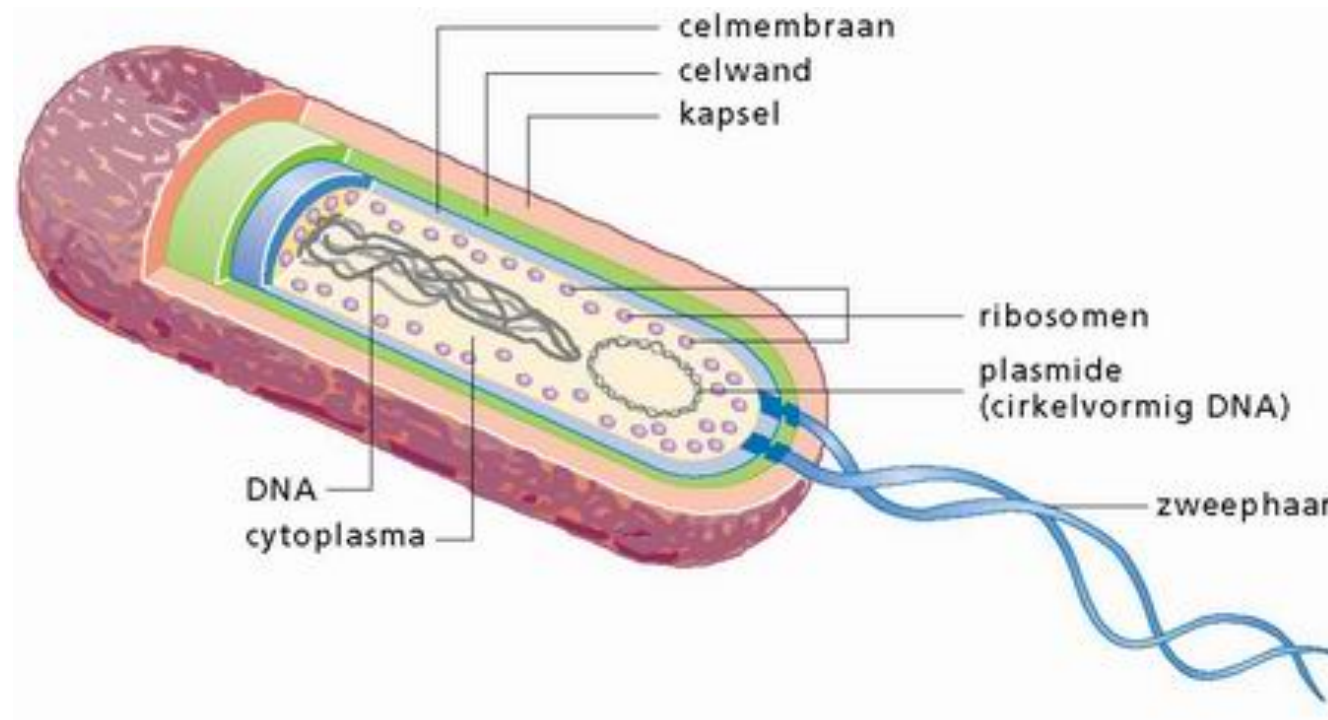
Bacterieel genoom



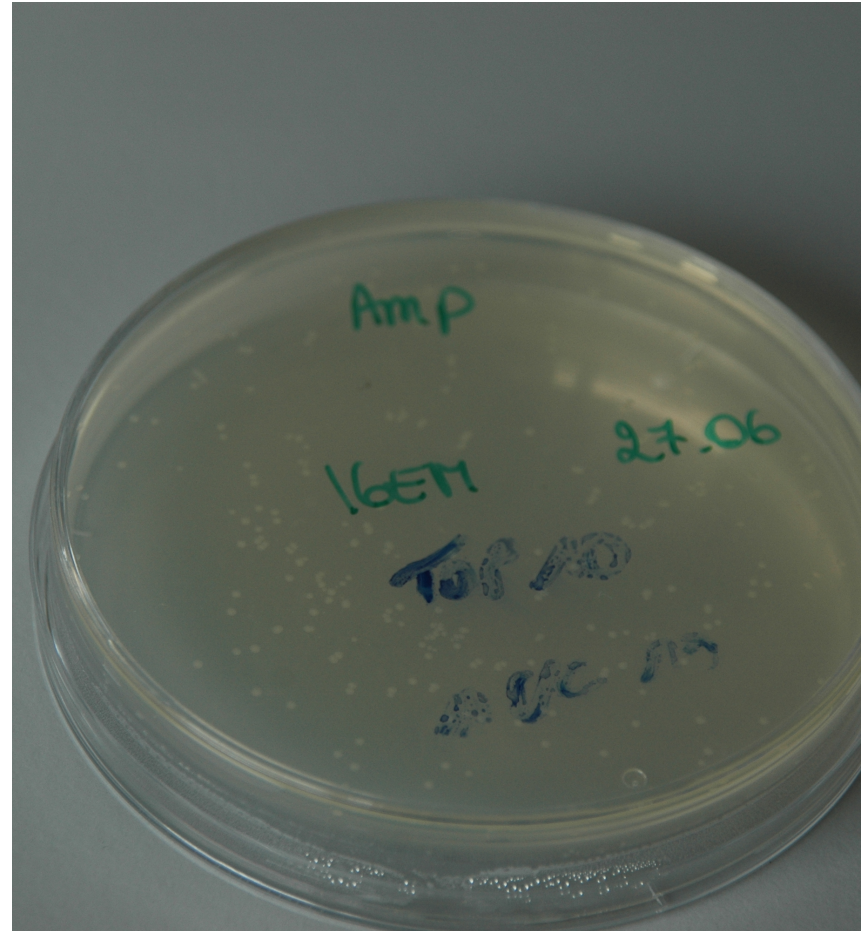
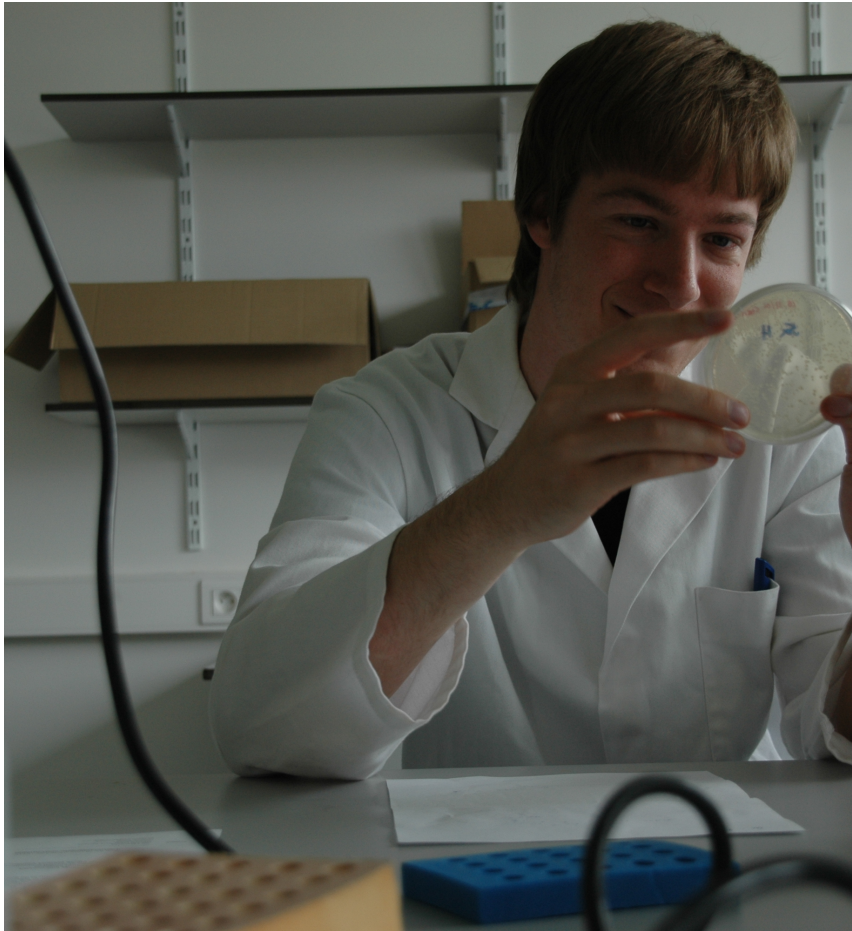
Wat is een bacterie?



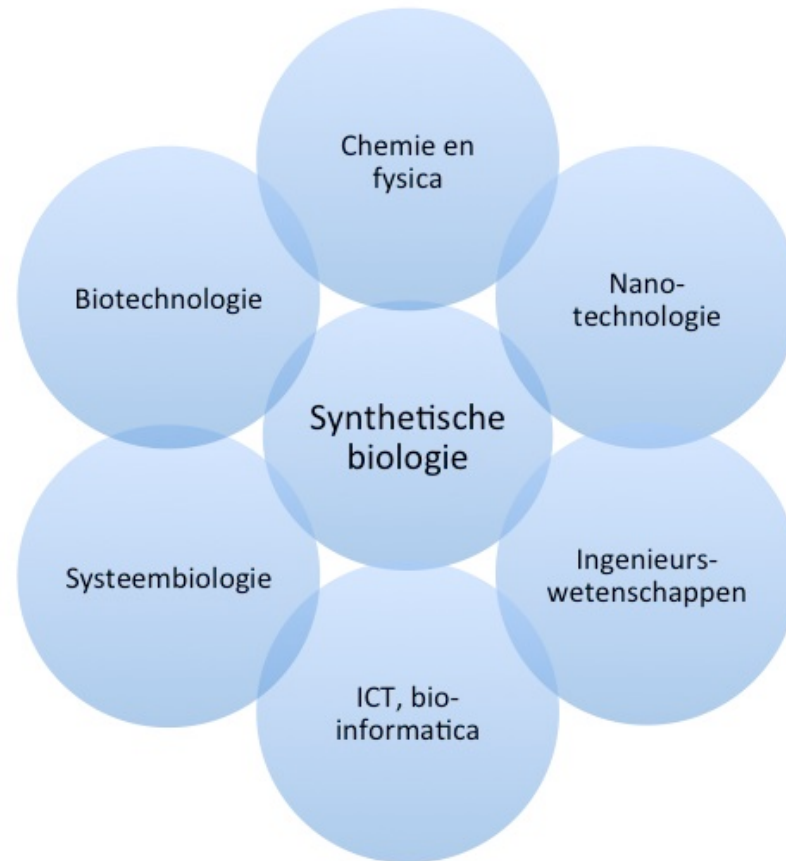
Opbouw van een bacterie



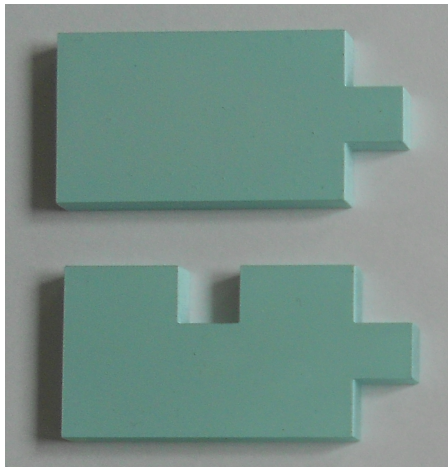
Bacteriën in het labo



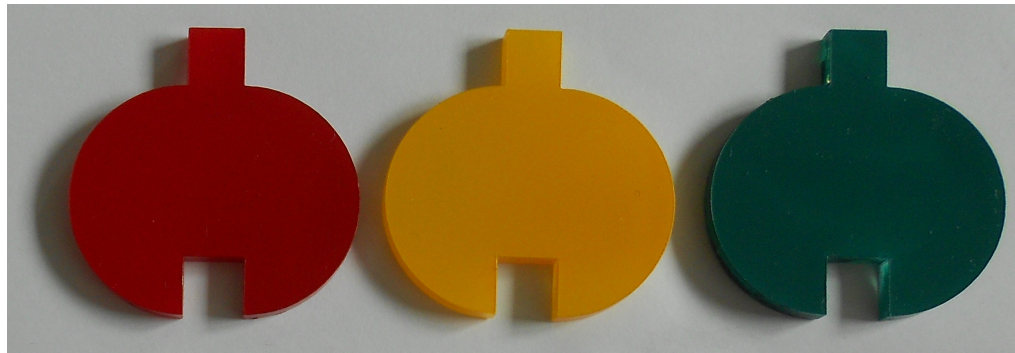
Wat is synthetische biologie?



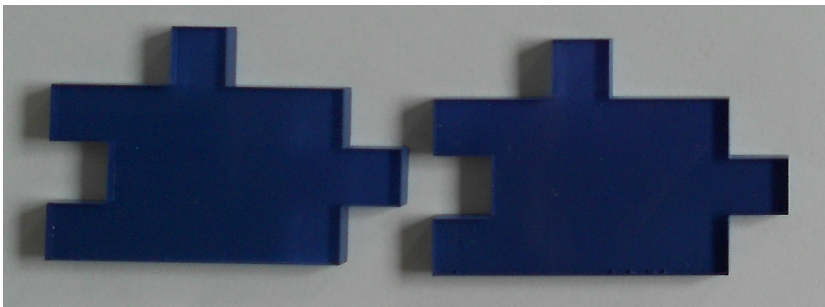
Spelen met DNA: Biobricks



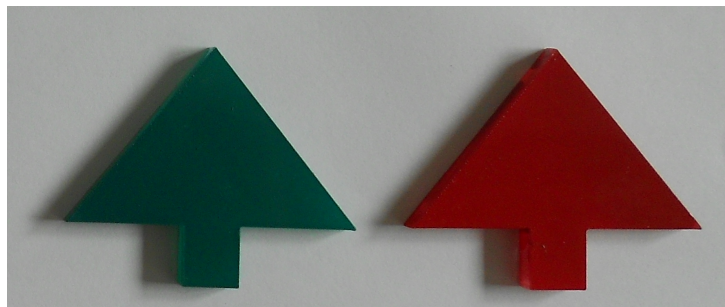
promoters



proteïnen

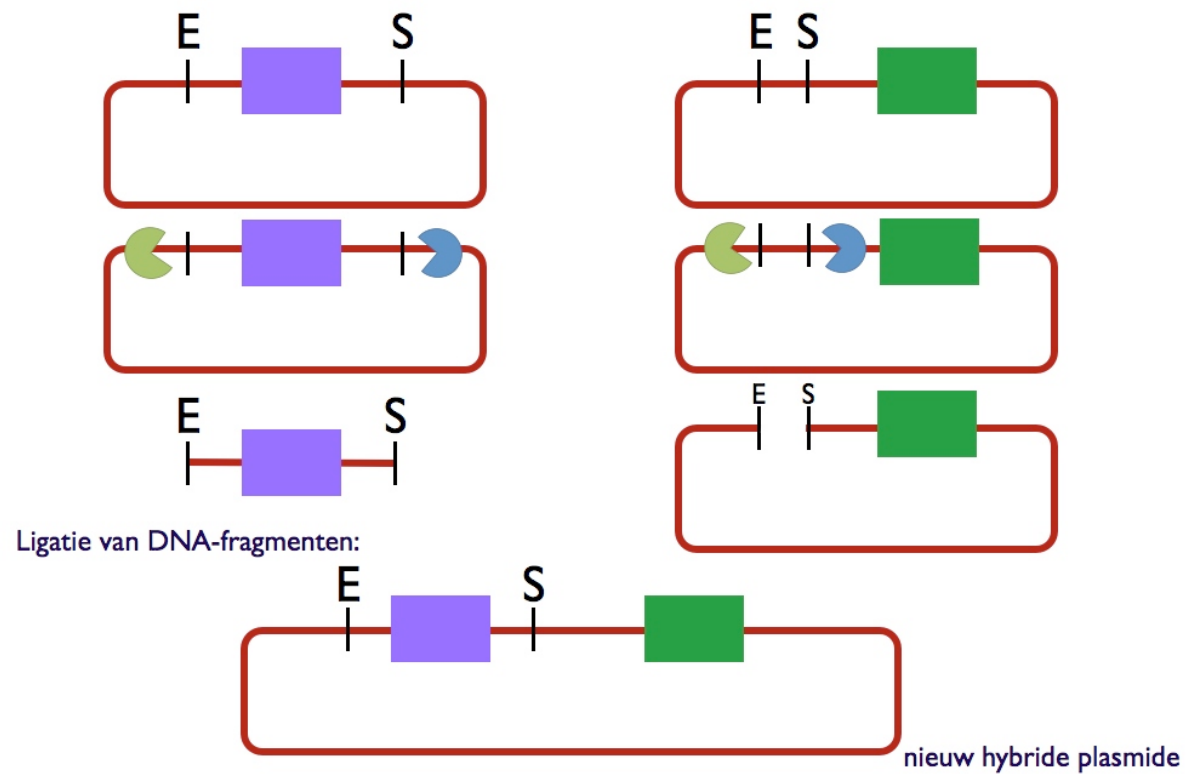


genen

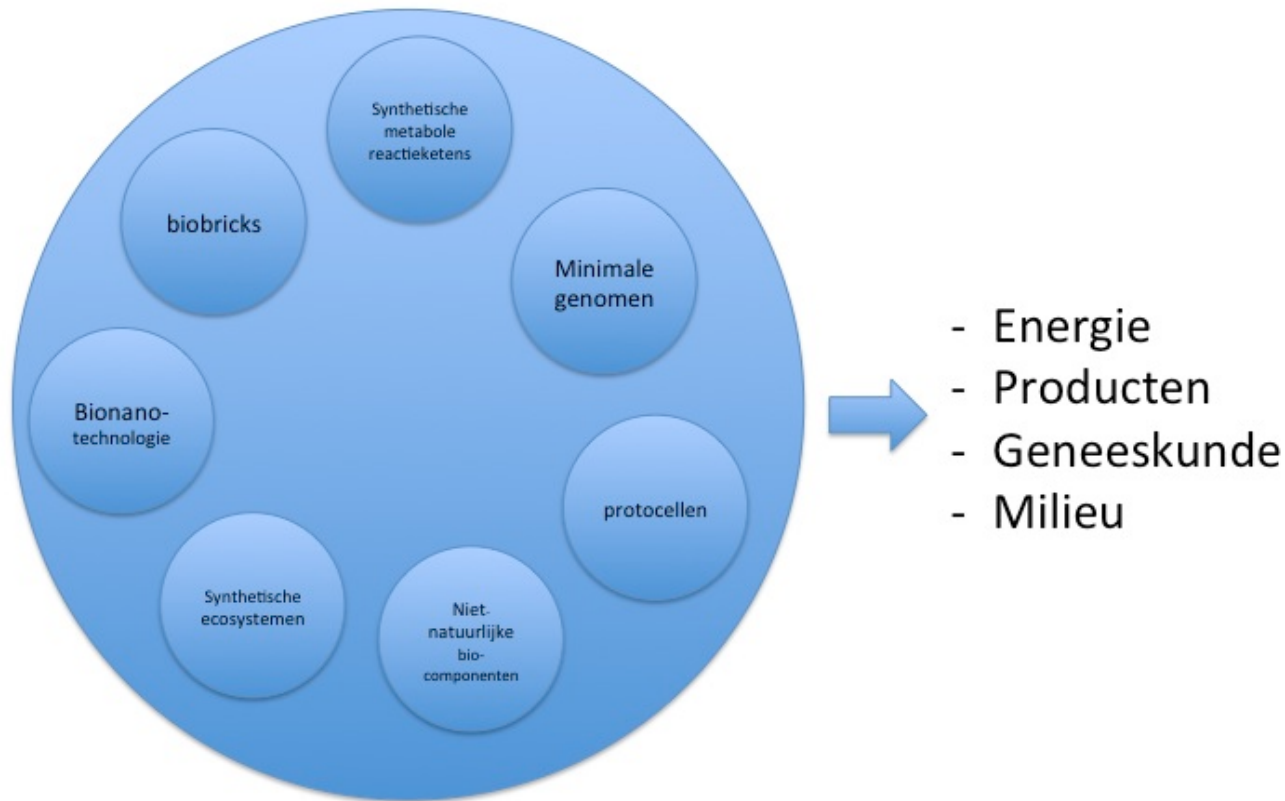


regulators

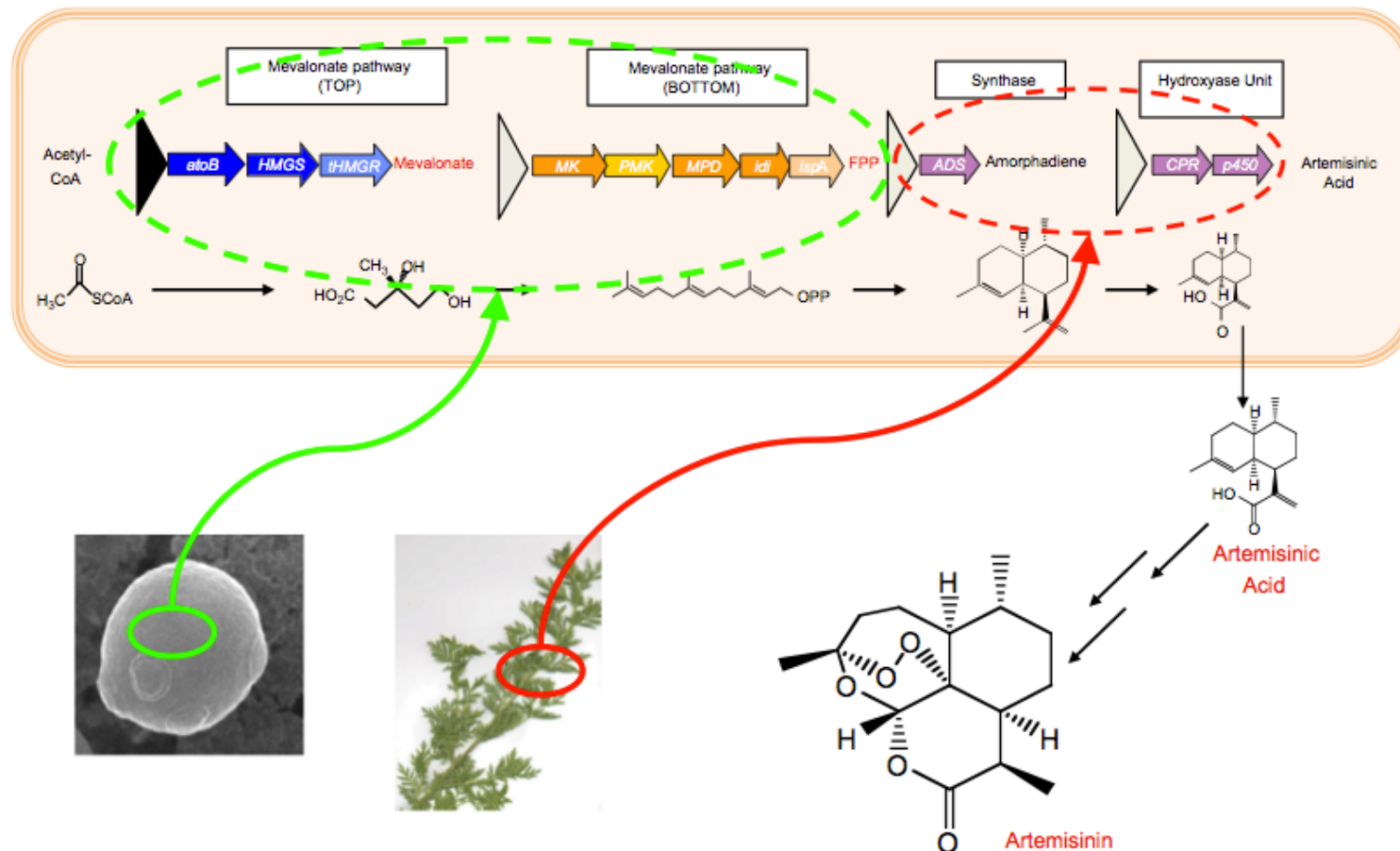
Spelen met DNA: Biobricks



Mogelijkheden van synthetische biologie



Geneesmiddelen: antimalaria-middelen



E. coligy: Plants with BanAphids



— methylsalicilaat
— (E)- β -farnesene



verdedigings-
mechanismen
activeren

aantrekken

voeden

verandering in
fenotype

aanvallen

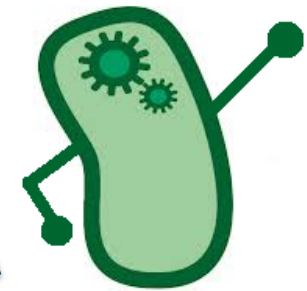
aantrekken

KU LEUVEN

— methylsalicilaat
— (E)- β -farnesene



E. coli



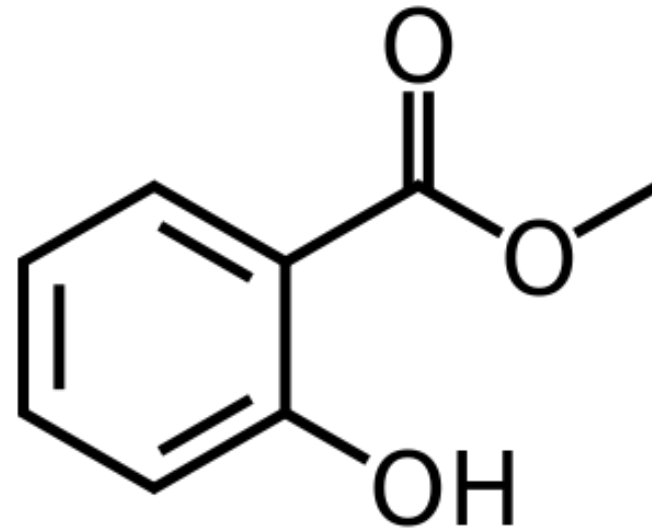
KU LEUVEN

Lieveheersbeestje in de aanval



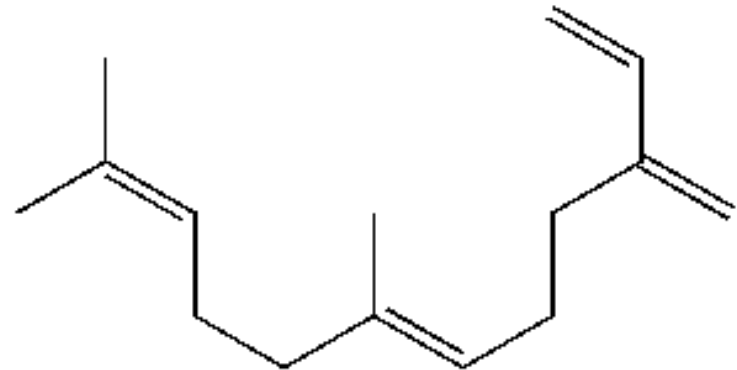
Plantenhormoon: methylsalicylaat

- vluchtig molecule
- omzetten naar salicylaat in de plant
- activeren van verdedigingsmechanismen in niet-geïnfecteerde plantdelen en andere planten



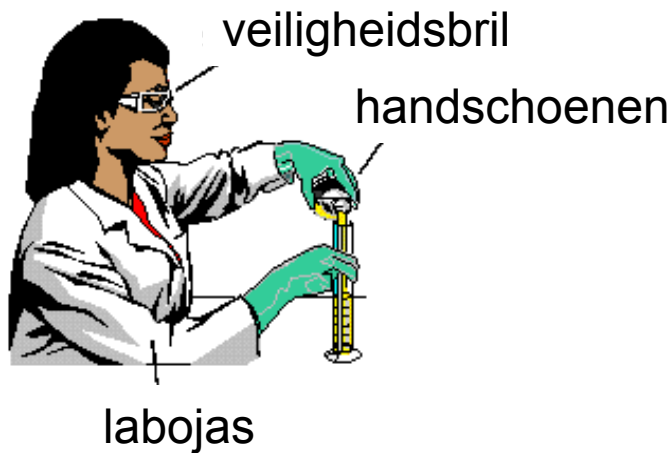
Alarmferomoon: β -farneseen

- geproduceerd door bladluizen
- aanmaken na aanval van vijand
- andere bladluizen waarschuwen



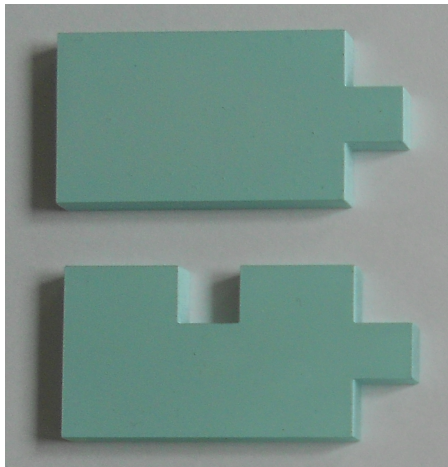
Maatschappelijk belang

- impact van synthetische biologie op maatschappij
 - biosafety

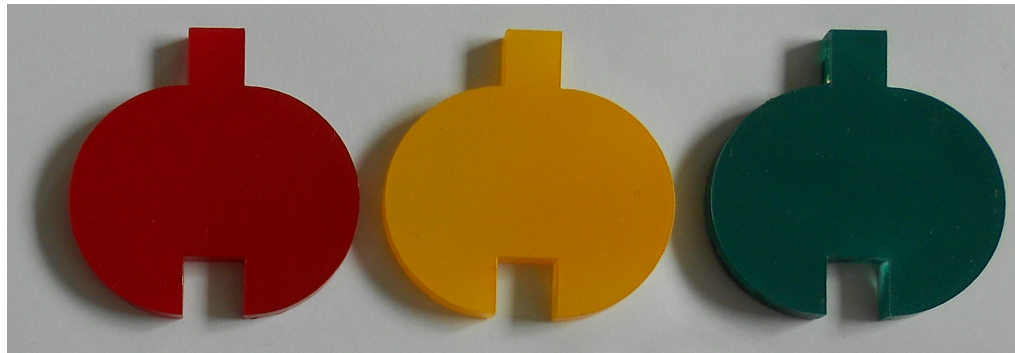


- biosecurity

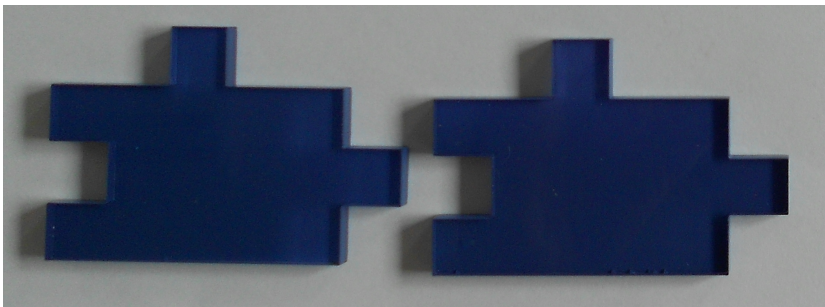
Oefeningen



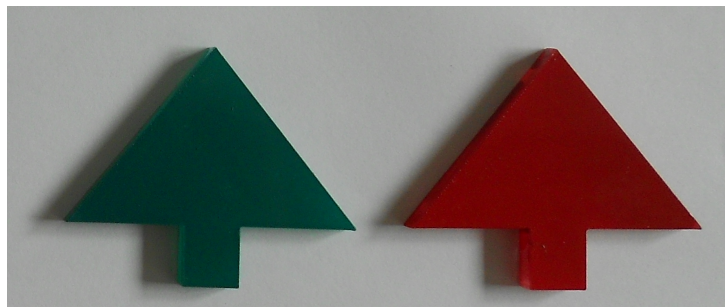
promoters



proteïnen

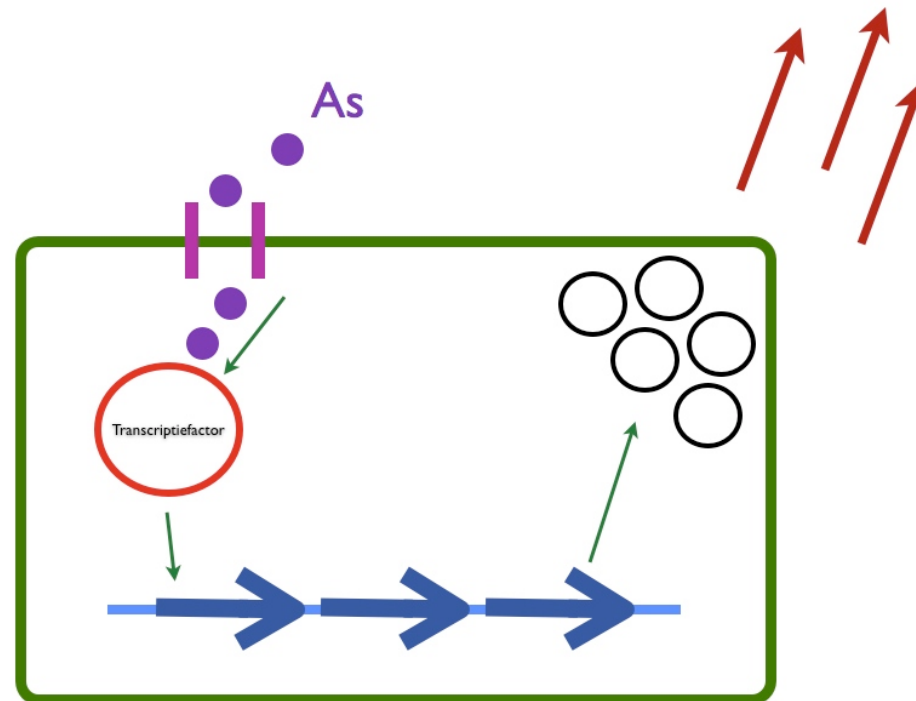


genen

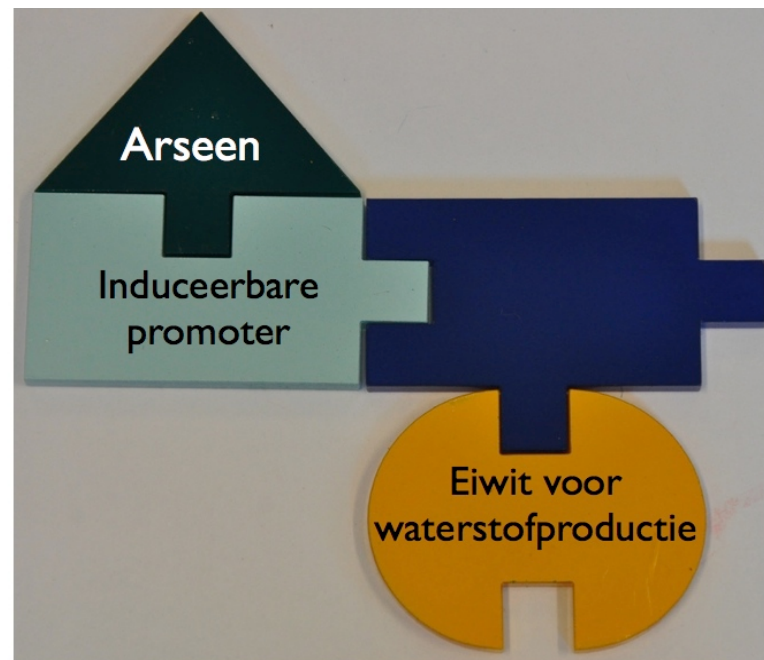


regulators

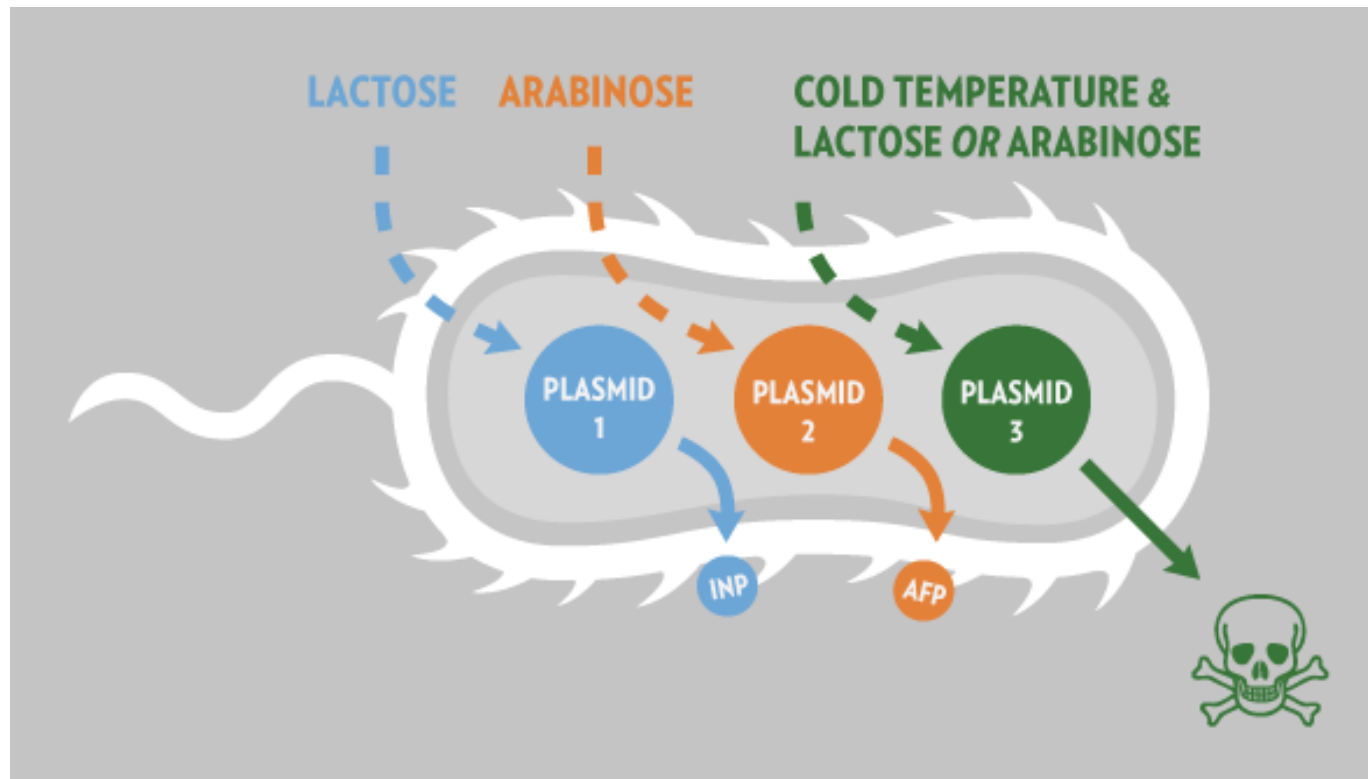
Oefening 1: biosensor



Oefening 1: oplossing



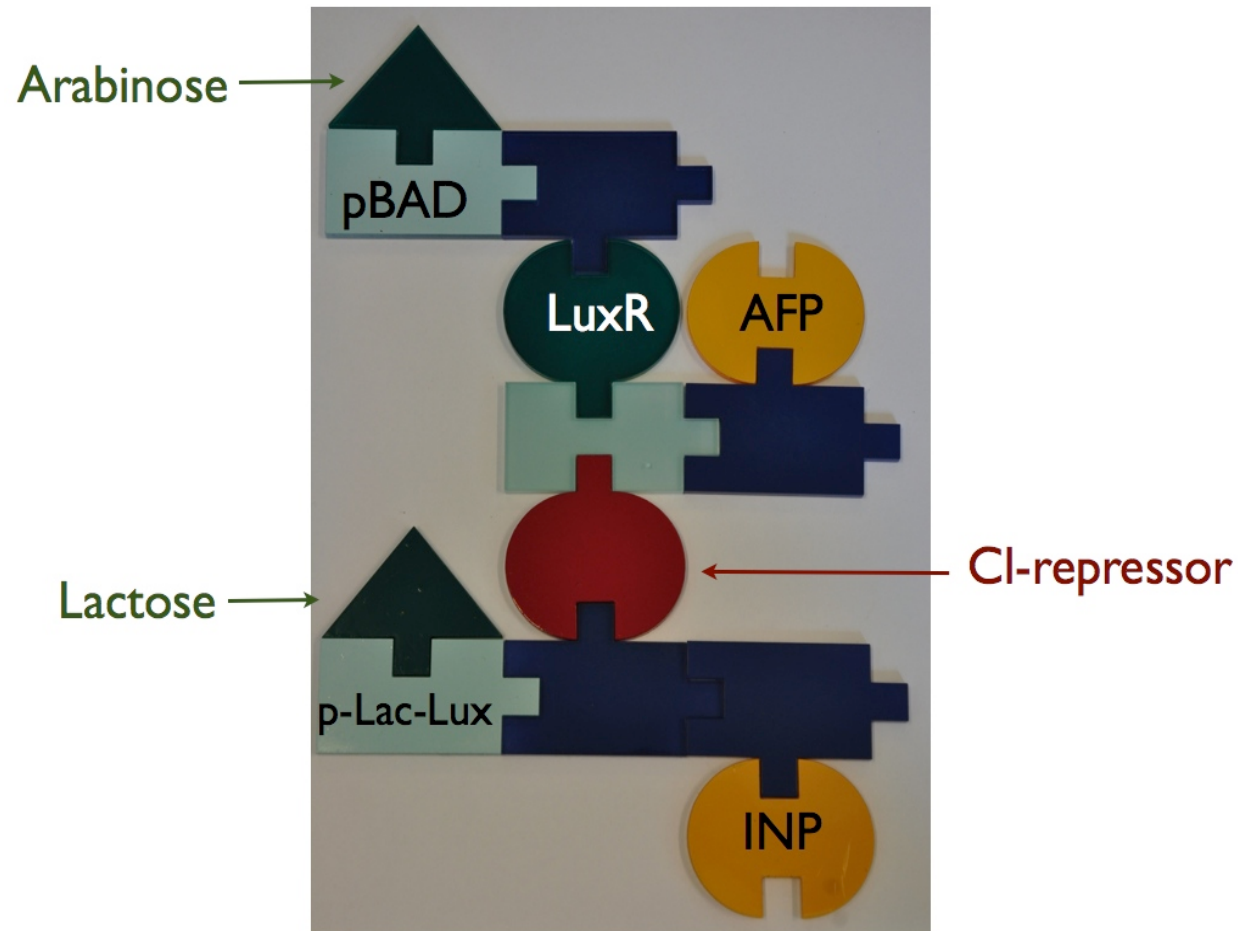
Oefening 2: ED Frosti



Oefening 2: ED Frosti

- stimulatoren: lactose en arabinose
 - promotoren: pBAD, pLux-CI, pLac-Lux
 - genen
 - eiwitten: AFP, INP, CI-repressor
-
- lactose bindt pLac-Lux
 - arabinose bindt pBAD
 - LuxR bindt pLux-CI

Oefening 2: oplossing

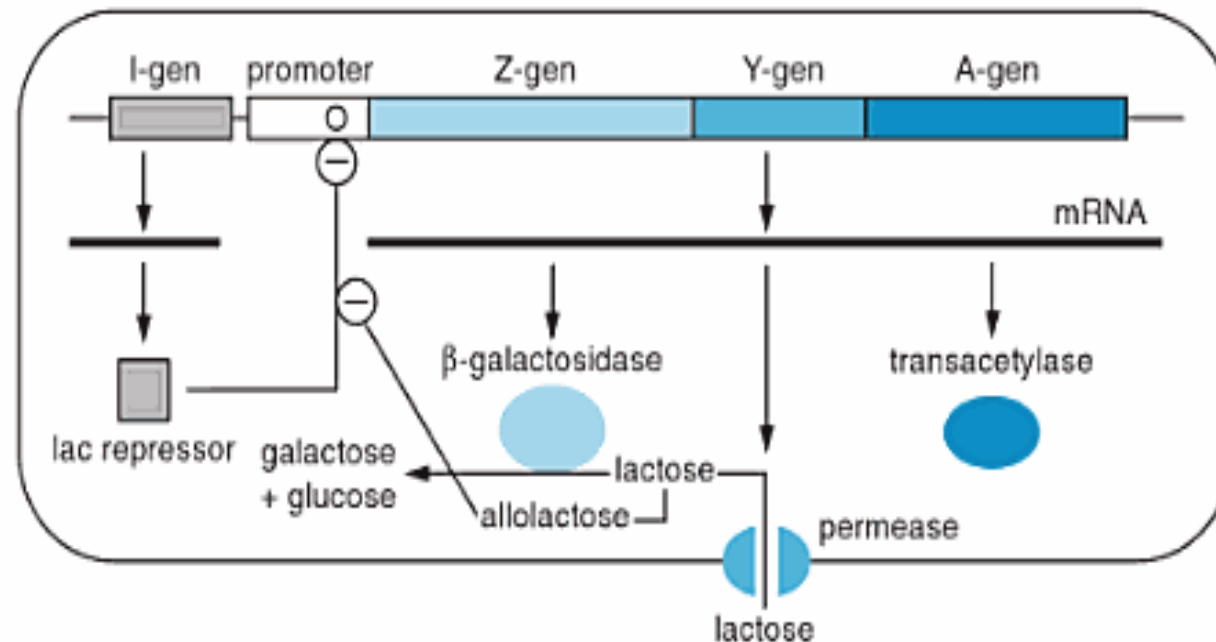


Oefening 2: ED Frosti

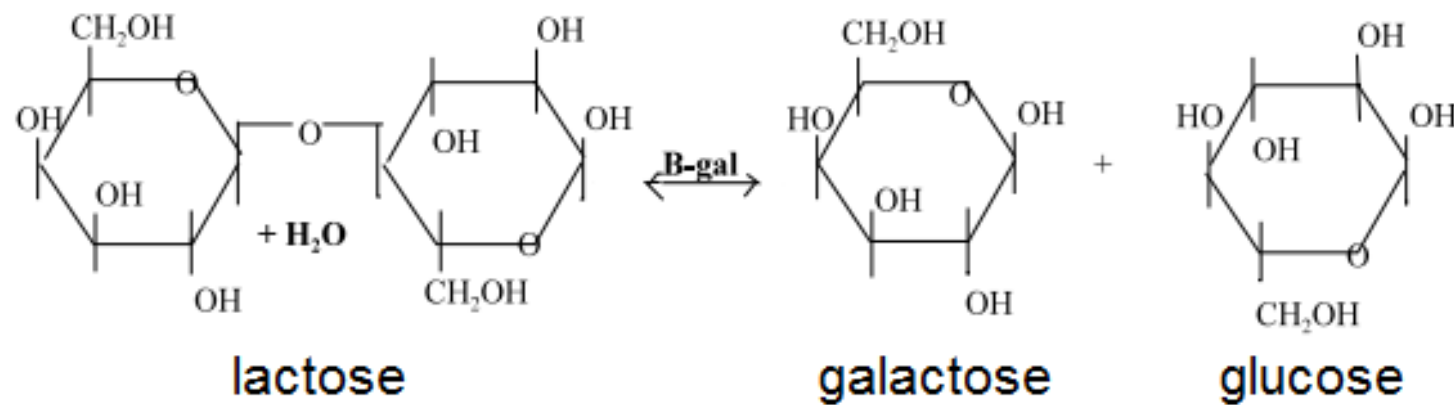


Experiment: β -galactosidase assay

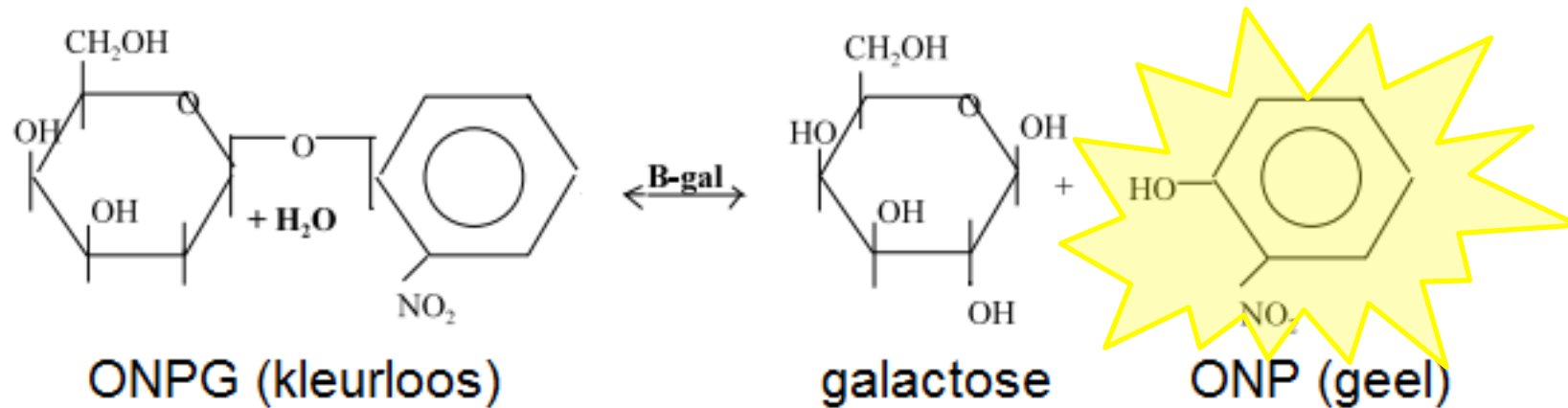
- geen lactose aanwezig $\rightarrow$ β -galactose niet aanmaken
- lactose aanwezig $\rightarrow$ β -galactose aanmaken



Experiment: omzetting lactose



Experiment: omzetting ONPG



Experiment: protocol

- 30 μ l ONPG in een eppendorf tube
- voeg 1 μ l β -galactosidase toe
- wacht enkele minuten

