



National Institute for Public Health  
and the Environment  
*Ministry of Health, Welfare and Sport*

## The Dutch bottom-up approach in raising biosecurity awareness:

*how to reach  
professionals, students  
and amateurs?*

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Head Netherlands Biosecurity Office



# Current legislation in the Netherlands

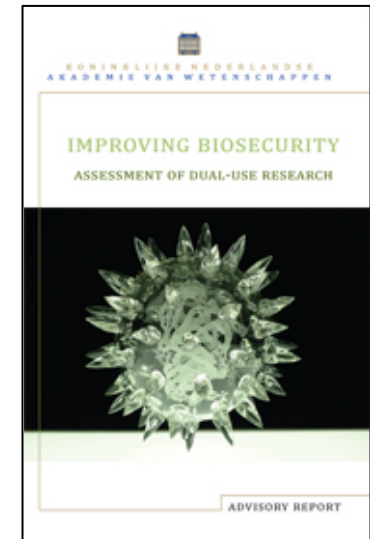
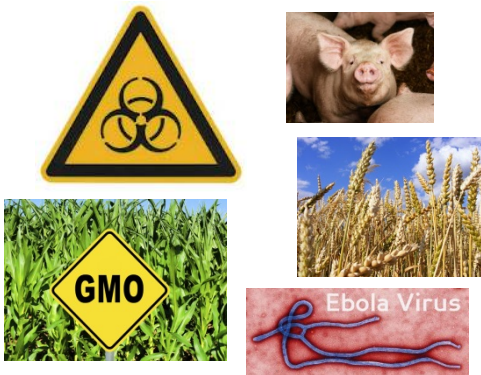


## Biosafety:

- Directive 2000/54/EC on biological agents at work
- Directive 2009/41/EC on the contained use of gmo's
- Directive 2000/29/EC on protective measures against the introduction of organisms harmful to plants or plant products

## Biosecurity/Dual Use:

- Council regulation EC 428/2009 setting up a Community regime for the control of exports, transfer, brokering and transit of dual-use items





# Towards a biosecurity policy in the Netherlands

## Aims of the Government:

- Reducing the risk of misuse of biological agents
- Safe and effective action in case of emergencies (response)

## Targets of the Government:

- Integrate Biosafety and Biosecurity -> develop biorisk policy
- Further strengthen the implementation of the BTWC
- Link with existing biosafety management
- Outreach and awareness raising among biosecurity professionals and scientists

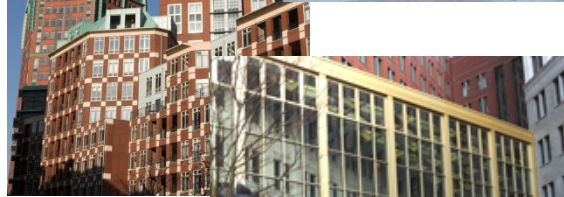
└───────────▶ **Bottom-up approach**



# Coordinated Biosecurity Regime



Government of  
the Netherlands



Ministry of Health, Welfare  
and Sport



Hospitals, Health

Ministry of Economic  
Affairs



Plant & Animal pathogens

Ministry of Social Affairs  
and Employment



Human pathogens

Ministry of Education,  
Culture and Science



Universities, KNAW

Ministry of Security and  
Justice



Bioterrorism & security

Ministry of Infrastructure  
and the Environment



GMOs

Ministry of Foreign Affairs



Export control, BTWC

Ministry of Defence



Defence & security



## Biosecurity policy: bottom-up approach

- The Dutch biosecurity regime works **bottom-up** rather than top down
- Each stakeholder has its own responsibility, which involves;
  - Risk management (biosecurity, biosafety and non-proliferation)
  - Awareness & education



students → scientists → biorisk professionals → managers → regulators

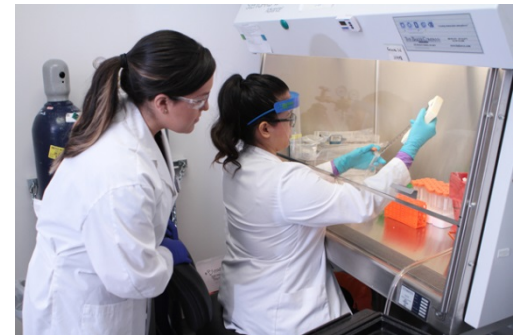


# The Netherlands Biosecurity Office

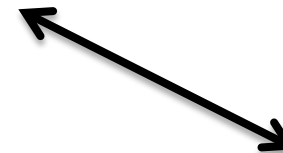
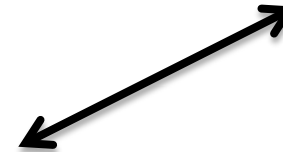
National biosecurity knowledge and information center



Government



Professionals





## International participation

The Netherlands Biosecurity Office is expanding its international visibility by participating in international events

- EBRF - European Biosecurity Regulators Forum
- IEGBBR - International Expert Group on Biosafety and Biosecurity Regulation
- Extended Biosafety Advisory Group of the WHO
- ...



World Health  
Organization





# Outreach and awareness raising

- Create knowledge base
- Involve stakeholders
- Create network
- Develop tools
- Organise workshops

Trust between science,  
private institutions  
and the government



*Common understanding*



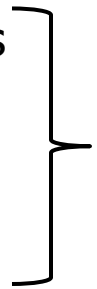
**Professionals**



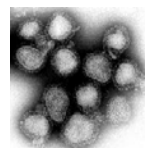


# Stakeholders involved

- Professionals
- Semi professionals
- Amateurs
- Students
- ...



- Do-it-yourself (DIY) biology
- International Genetically Engineered Machine (iGEM)



**Do-it-yourself biology: challenges and promises for an open science and technology movement**  
 Syst Synth Biol (2013) 7:115–126

**European do-it-yourself (DIY) biology: Beyond the hope, hype and horror**  
 Günter Seyfried<sup>1)</sup>, Lei Pei<sup>2(3)</sup> and Markus Schmidt<sup>2(3)\*</sup>  
 Bioessays 36: 548–551, © 2014

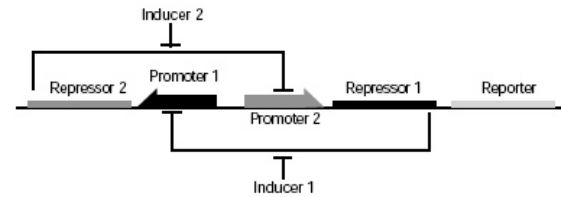
SYNTHETIC BIOLOGY  
**Engineered yeast paves way for home-brew heroin**  
*Advance holds potential for better opiate painkillers – but raises concerns about illicit use.*  
 21 MAY 2015 | VOL 521 | NATURE | 267

**Mitigating the Risks of Synthetic Biology**  
 Gigi Kwik Gronvall  
 February 2015

**Biosecurity at iGEM**  
 Ensuring the Secure Advancement of Synthetic Biology by the Next Generation  
 Michelle Cann  
Center for International Science and Technology Policy  
 Elliott School of International Affairs, The George Washington University



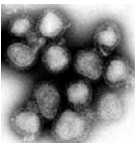
# Synthetic Biology



Synthetic biology is the engineering of biology aiming at the design and construction of new biological parts, devices, and systems

## *'Dual use' potential of synthetic biology*

- DNA biobricks online available
- Ability to recreate a pathogen or novel pathogens from scratch
- Tools to sequence, synthesize, manipulate, and assemble DNA are increasingly straightforward and inexpensive
- Accessible to more and more people with less scientific experience and degrees





# The Dutch bottom-up approach in raising biosecurity awareness: *how to reach professionals, students and amateurs?*

- **Saskia Rutjes**: Raising biosecurity awareness among professionals
- **Cecile van der Vlugt**: Synthetic biology and biosecurity awareness
- **Harold van den Berg**: Biosecurity self-assessment toolkit and vulnerability assay

