



# Team-based learning, formatief handelen en AI-proof toetsen

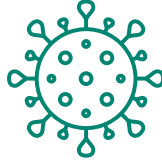
Cathelijn Aarts, Maroeska Burggraaf & Anna Posthumus  
Meyjes



# Ontwikkeling module



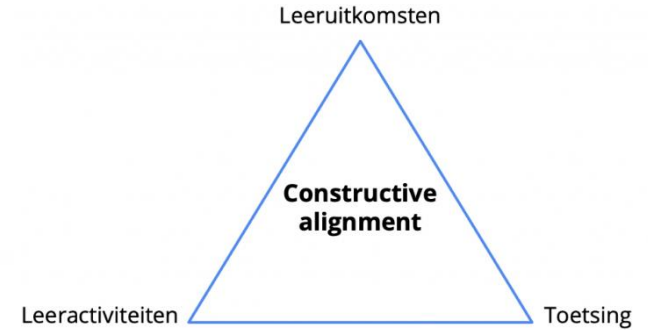
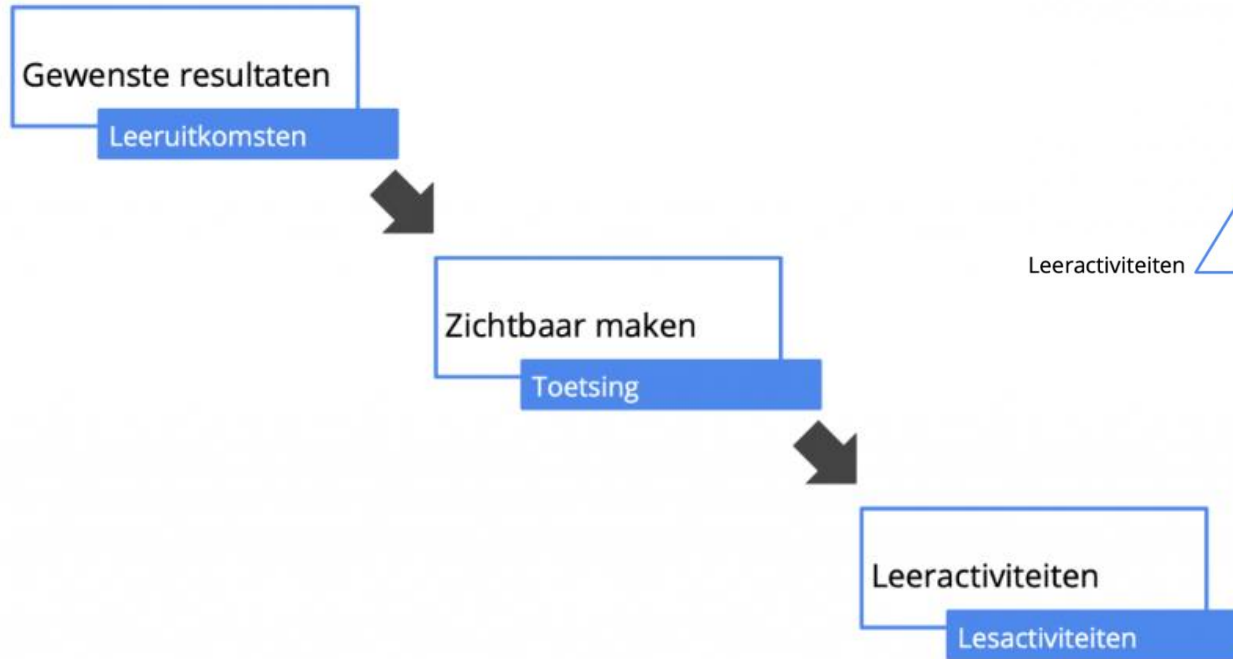
Studenten jaar 3  
Biologie & Medisch  
Laboratoriumonderzoek



Virologie



# Aanpak: backward design



# Aanpak: Leeruitkomsten

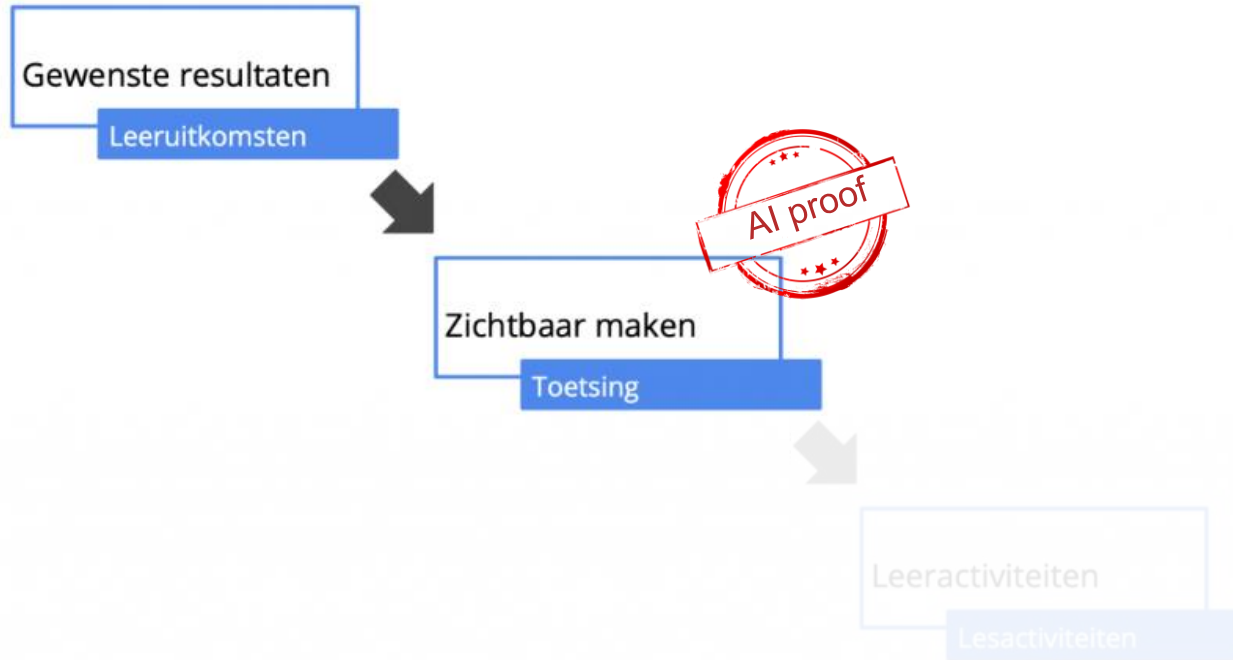


De student kan

1. de **eigenschappen** van virussen beschrijven
2. aan de hand van de virale **pathogenese** uitleggen hoe virale infecties voorkomen en behandeld kunnen worden
3. de meest gebruikte **technieken** die ingezet worden bij virologisch onderzoek beschrijven
4. uitleggen hoe virussen **ingezet worden ter voorkoming en behandeling van ziektes** en aangeven wat hierin de uitdagingen zijn



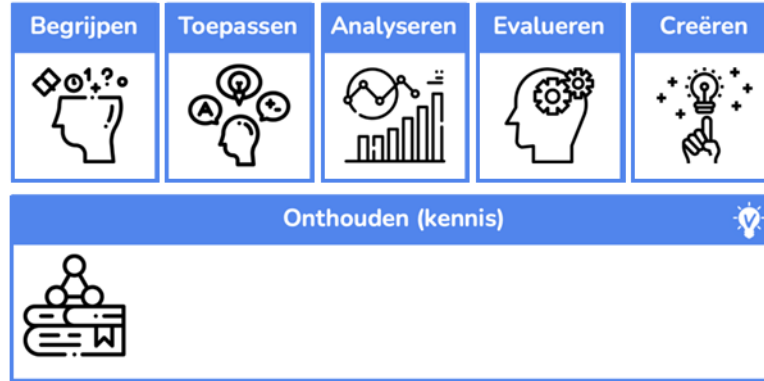
# Aanpak: Toetsing



# Aanpak: Toetsing

Zichtbaar maken

Toetsing



kennistoets



verslag

- ✓ Toepassen basiskennis
- ✓ Analyse van therapeutische mechanismen
- ✓ Argumentatie geschikte technieken
- ✓ Evaluatie therapie

# Aanpak: Toetsing

Zichtbaar maken

Toetsing



How can I help you today?

**Compare marketing strategies**  
for sunglasses for Gen Z and Millennials

**Write a course overview**  
on the psychology behind decision-making

**Plan a trip**  
to explore the Madagascar wildlife on a budget

**Plan an itinerary**  
to experience the wildlife in the Australian outback

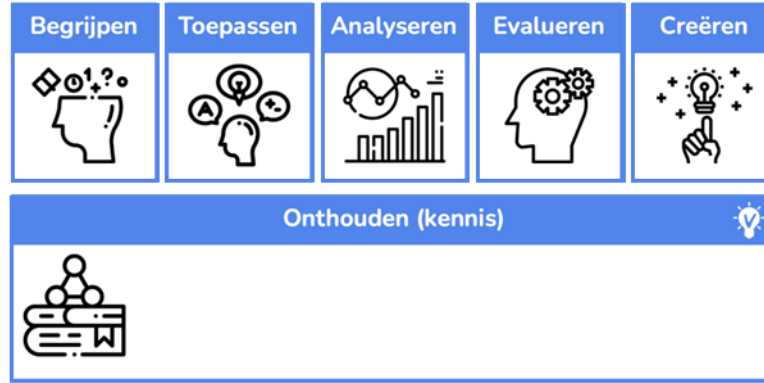
Message ChatGPT...



# Aanpak: Toetsing

Zichtbaar maken

Toetsing



kennistoets



verslag

- ✓ Toepassen basiskennis
- ✓ Analyse van therapeutische mechanismen
- ✓ Argumentatie geschikte technieken
- ✓ Evaluatie therapie



presentatie



# Aanpak: Toetsing



- ! Spannend
- ! Vorm vs inhoud

- ✓ Laagdrempelig
- ✓ Infographic als spiekbriefje

Virtus	
Therapie	
Technieken	
Uitdagingen	

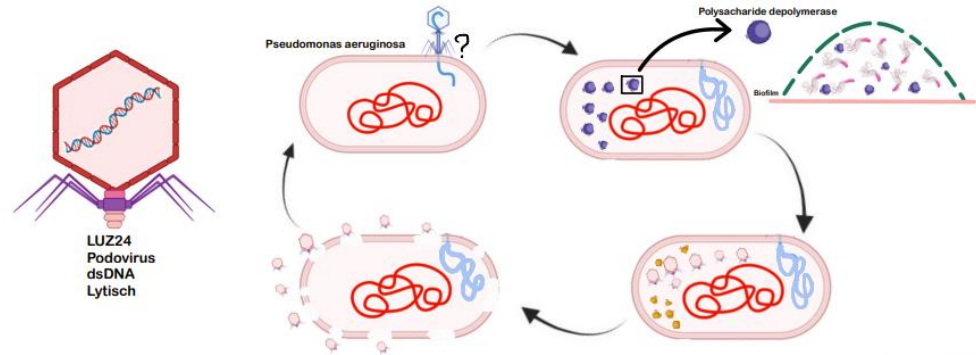
# Visual thinking: infographics



gesprek



- ✓ Actief bezig
- ✓ Dieper begrip
- ✓ Samenwerken



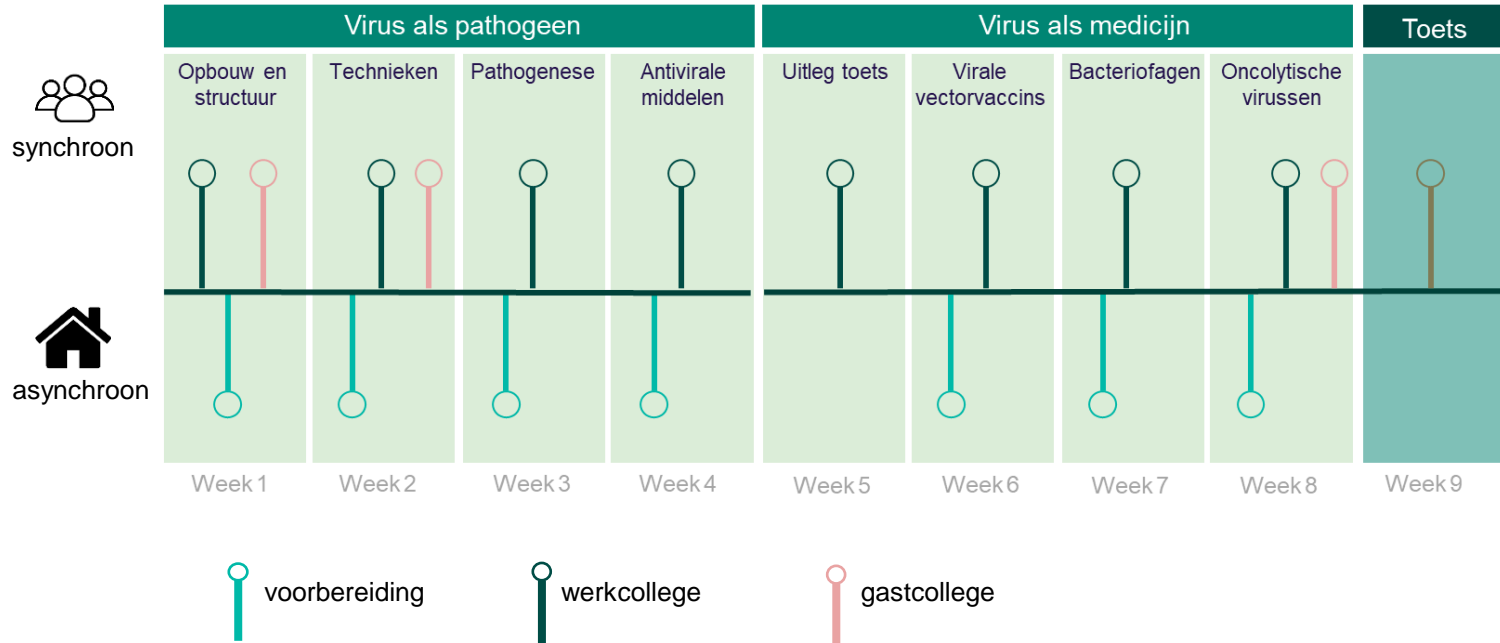
# Aanpak: Leeractiviteiten



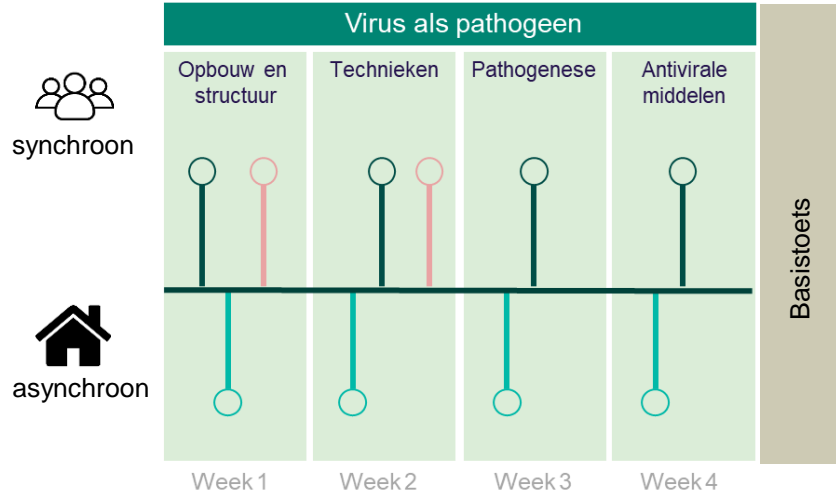
## Randvoorwaarden keuzemodule

- 5 EC
- 8 WC verspreid over 10 weken
- Gastcolleges
- 38 docenten per klas

# Aanpak: Leeractiviteiten



# Leeractiviteiten Deel 1



Voorbereiding: e-learnings



Werkcollege: verdiepende opdrachten



Gastcollege / praktijk



Het helpt mij als dingen verplicht zijn

# Leeractiviteiten Deel 1



Vorbereitung: e-learnings

# Leeractiviteiten Deel 1

Week 3 Pathogenese  
*Deel 1: Transmissie en infectie*

36% COMPLETE

3 / 28

# Leeractiviteiten Deel 1

Werkcollege: verdiepende opdrachten



Quiz



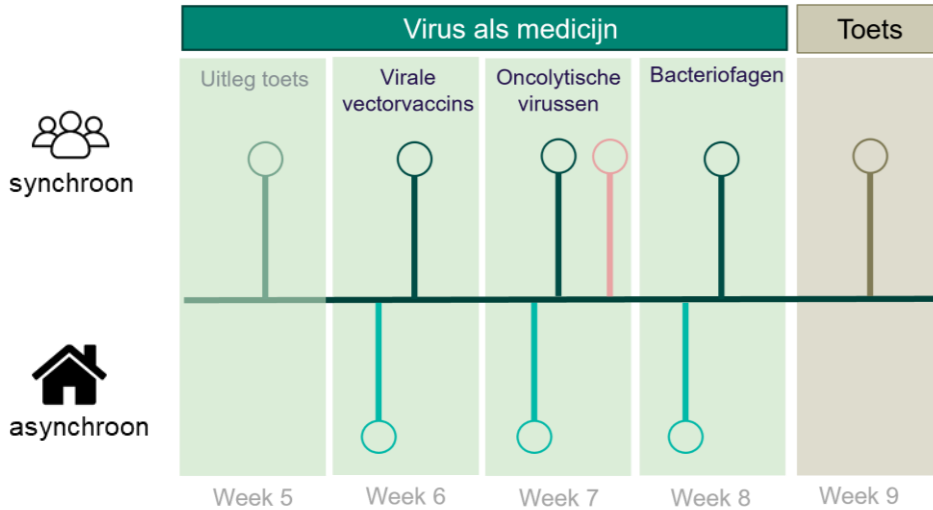
Expertgroepen (jigsaw)






Toepassingsopdrachten  
in groepjes



# Leeractiviteiten Deel 2



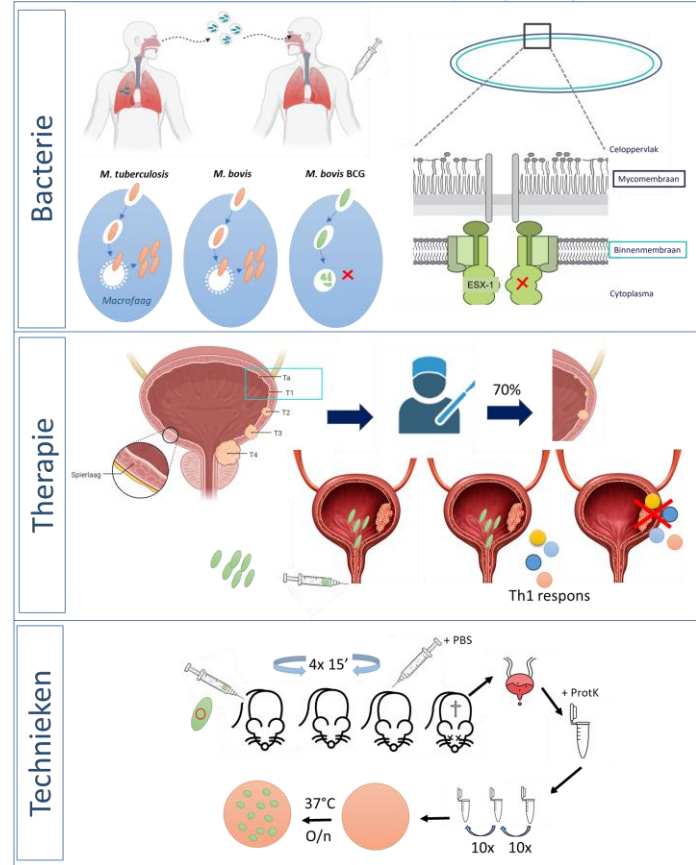
-  Voorbereiding: Feedbackfruits
-  Werkcollege: verdiepende opdrachten
-  Gastcollege

# Behandelen toetsvorm

- Voorbeeld infographic
- Succescriteria opstellen
- Zelf aan de slag met gegeven informatie

## BCG vaccin als blaaskankertherapie

Maroeska Burggraaf  
(s12334578)

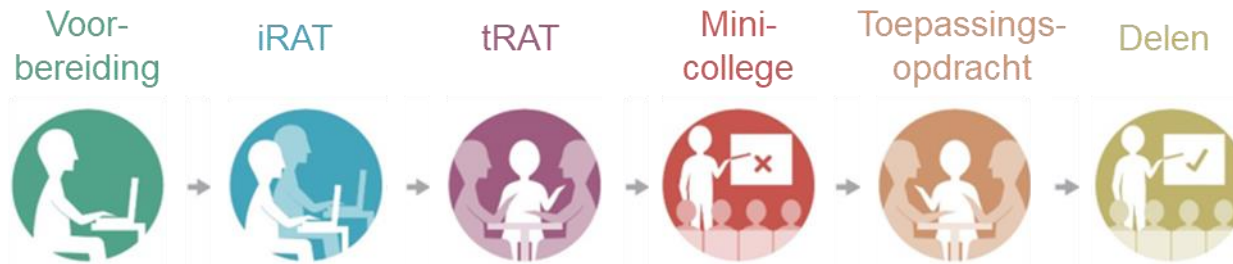


# Opbouw werkcolleges



## Team Based Learning

- Evidence based learning strategy ('70)
- Werken in Teams



# Opbouw werkcolleges



Vorbereiding



iRat / tRat   
Uitleg verdiepingsopdracht

60'



Zelfstudie

90'



Bespreken verdiepingsopdracht  
Feedback infographic 

90'

# Vorbereitung in Feedbackfruits



## Vorbereitung

- Interactive Document
- 3 tot 4 reviewartikelen
- Gerichte vragen

exploration. Studies systematically exploring the effects of systemic ICIs prior to, concomitantly with, or following OV therapy will aid in the future design of clinical trials to enhance efficacy and increase patient response rates.

### Key Points

Oncolytic viruses induce immunogenic tumor cell death, which makes them ideal partners for combination with immunotherapies such as immune checkpoint inhibitors and adoptive T cell therapies.

Effective combination therapies will depend on careful scheduling of the component parts.

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### 1 Oncolytic Virotherapy

Oncolytic virotherapy is currently gaining traction as one of the most promising approaches for cancer immunotherapies in the clinical arena. Oncolytic viruses (OVs) have unique mechanisms of action compared to currently available treatments. Their antitumor effects include direct tumor-selective oncolysis, as well as activation of host systemic innate and adaptive immune responses [1, 2] resulting in the recruitment of diverse immune cell types, including lymphocytes, into the tumor microenvironment. These qualities make OVs very attractive candidates for combination with cancer immunotherapies, which rely on the presence and function of antitumoral lymphocytic populations.

OVs are defined as replication competent viruses that selectively destroy tumor cells. Viruses have long been considered as possible antitumoral agents based on observations of cancer regressions after natural viral infections [3]. Tumors have evolved mechanisms of defective damage/pathogen recognition responses, making them more susceptible

△ *via*

Open question

Required

Op welke twee manieren zorgen oncolytische virussen voor het doden van tumorcellen?

7 answered, 1 skipped out of 65

12,5% skipped this question

DETAILS

486

L. Russell et al.

to viral infection. In addition, the ability to genetically engineer viral genomes has enabled the development of safe and powerful tumor-specific viruses that also express cytotoxic, immunomodulatory, or imaging genes. These agents can range from small RNA virus backbones, which encode only a handful of genes, often replicate quickly, and lyse tumor cells to release thousands of viral progeny, to large DNA virus backbones such as adenovirus, herpesvirus, or vaccinia virus, which can encode from 25 to over 250 different viral genes and allow more leeway for genetic manipulation but may be slower to replicate and spread [4–6].

The clinical safety of OVs is now being established, with thousands of patients treated to date using different virus platforms, doses, and routes of delivery. The majority of the OV clinical trials have tested intratumoral or local viral administrations with manageable safety profiles. Viruses that have been safely delivered intravenously into patients include adenovirus, measles virus, vaccinia virus, reovirus, picornavirus, and Newcastle disease virus. Most patients experience influenza-type symptoms within 24 h of administration and fluctuations in systemic cytokines levels a few hours after viral infusion that are usually readily manageable [1, 7].

The epidemiology of the parental virus, reflected in the seroprevalence of neutralizing antibodies to the viral vector, determines whether OVs can be delivered efficiently systemically or whether direct intratumoral injection is likely to be more effective. Direct intratumoral injection avoids the possibility of serum neutralization and provides efficient delivery. However, it also poses a technical challenge depending on the tumor location, which can require specialized injection techniques via interventional radiology. On the other hand, the treatment of disseminated tumors using a systemically delivered OV may provide a greater chance of virus infection of multiple tumor nodules, as each

Therefore, in addition to direct tumor lysis, the importance of the immune response on the efficacy of OV therapy has been widely demonstrated [11–14]. Currently, most of the efforts to “arm” OV consist of adding genes that have the ability to boost the activation of immune responses within the tumor microenvironment, such as cytokines or costimulatory molecules [15]. Following the approval of T-VEC, a large number of oncolytic virotherapy trials, using myriad viral platforms, have been initiated either as monotherapies or as combination therapies with other modalities, such as chemotherapy, radiotherapy and, in particular, immunotherapies [16, 17].

### 2 Oncolytic Viruses (OVs) and Activation of Immune Responses

Subsequent to viral infection, host cells orchestrate diverse mechanisms directed to shut down replication and avoid pathogenicity. Initially, viral pathogen-associated molecular patterns (PAMPs) are recognized by surface or intracellular host pattern recognition receptors (PRRs) followed by the activation of several signaling pathways, resulting in the induction of chemokines and cytokines such as type I interferons (IFNs). Therefore, activated innate immune cells, including neutrophils, granulocytes, natural killer (NK) cells, and antigen-presenting cells (APCs), will be the first to arrive and respond at the sites of infection. To consolidate pathogen control, an antiviral adaptive immune response produced by B and T cells is subsequently established [17, 18]. Tumor cells and their microenvironment have evolved many mechanisms to suppress the generation of any local or systemic antitumoral immune effectors [19, 20]. Hence, OVs, due to their ability to selectively infect and replicate in tumor cells, as well as their capacity of attracting

Open question

Hoe heet het eerste oncolytische virus dat

Open question

Required

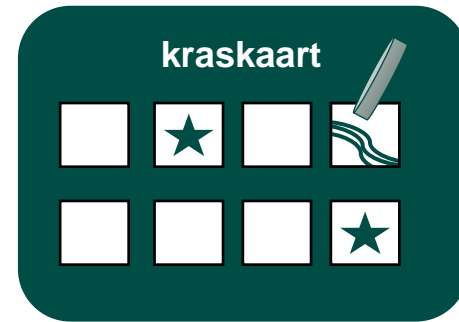
Welke cellen zijn betrokken bij het opruimen van een tumor?

6 answered, 1 skipped out of 65

14,3% skipped this question

DETAILS

- Readiness Assurance Test  
*Meerkeuze: onthouden/begrijpen/toepassen*
- Individueel & als Team
- Discussie
- Extra uitleg



Kraskaarten via:

<https://www.cognalearn.com/order-if-at-forms>

# Verdiepende opdracht

## T-Vec tegen melanomen

Raheb Hamid  
Gioneth Hernandez Barrero

Virus

**T-Vec klasse 1**

**Gastheer**

**Tropisme**

Therapie

**Toediening**

Intratumoraal  
Multidoses:  $10^6$ - $10^8$ - $10^9$

**Local Oncolytic Effect**

Immune stimulation initiates local and systemic anti-tumor response

**Systemic Effect**

Technieken

**Plaque Assay**

**ELISA**

Uitdagingen

**Voordelen**

**Nadelen**

23

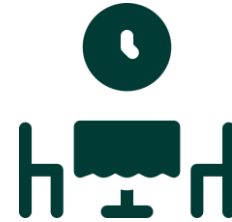
# Feedback geven en ontvangen



Informeel delen



Posterwalk met  
post-its



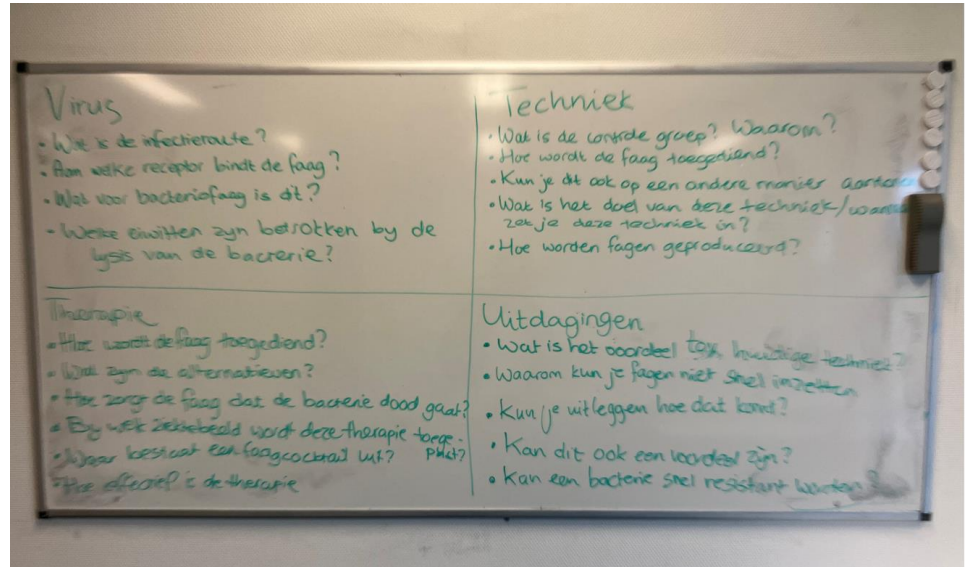
Speeddaten



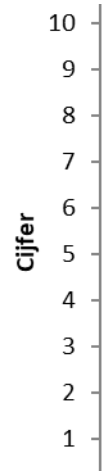
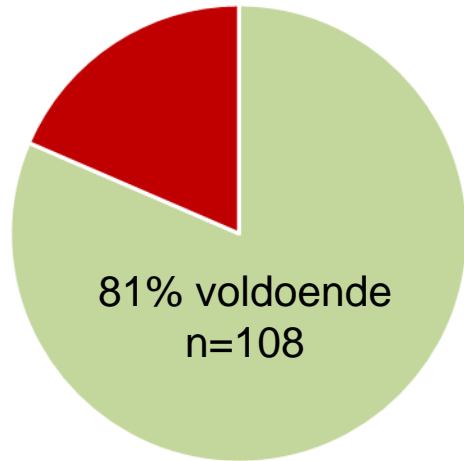


# Vragen verzamelen

- Voorbereiding op de toets
- Student actief
- Vragen gebruiken we in toets




# Evaluatie: Rendement en ervaringen




Gemiddelde cijfer  
7,0


# Evaluatie: Rendement en ervaringen



Fijn dat het om begrip ging, stof is hierdoor langer blijven hangen



Dat ik bezig was met leren maar dat niet zo voelde



Tijdens WC al bezig met eindproduct met kans op feedback

# Wat kun jij in jouw onderwijs gebruiken?

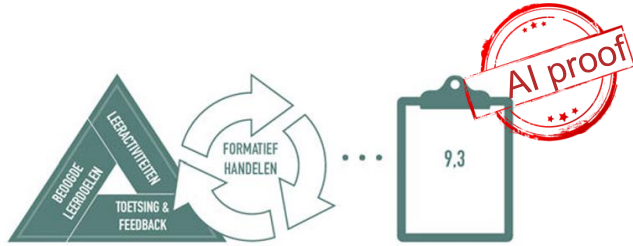


<https://www.mentimeter.com/app/presentation/alouj66dbwvu9vesht9vv1vu811n1ceo/9ncxbhww5d91/edit>

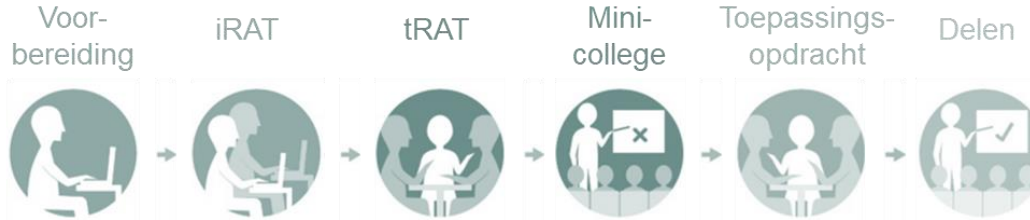
# Tips, tricks & Take-home

- ✓ Samen met studenten succescriteria opstellen
- ✓ Formatief handelen
- ✓ Toets op inhoud, niet op vorm
- ✓ Afwisseling in opdrachten met e-learning
- Studenten begeleiden bij digitale tools

# Vragen?



Virus	
Therapie	
Technieken	
Uitdagingen	



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