

Keabsahan dan keberkesanan vaksin dalam menangani wabak COVID-19

IIUM COVID-19 Community Outreach Initiative



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الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
بُيُوتٌ رِسْقِي الْمَلَأْنَا بِهَا الْجَنَّةَ مَالِئِينَهَا
Garden of Knowledge and Wisdom

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IKRA | FAH | AMANAH | IQRA | RAHMATAN LIL 'ALAMIN

SUSTAINABILITY INSTITUTION OF THE YEAR

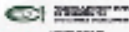
KULLIYAH OF MEDICINE

Pembuatan dan pembangunan vaksin

Green-Crown Awards
LIFE CYCLE
WINNER
2018 SUSTAINABILITY
INSTITUTION OF THE YEAR



GREEN CROWN



SUSTAINABILITY



UNITED NATIONS



RECIPIENT
AL-KHAWARIZMI
EDUCATION AWARD 2018

Premier
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5 fakta tentang vaksin

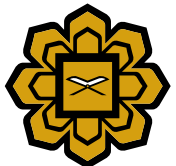
1. Vaksin selamat dan berkesan

2. Vaksin mencegah penyakit yang mematikan

3. Vaksin memberi kekebalan yang lebih baik daripada jangkitan semula jadi

4. Vaksin gabungan ialah selamat dan bermanfaat

5. Sekiranya program vaksinasi/imunisasi dihentikan penyakit tertentu akan kembali



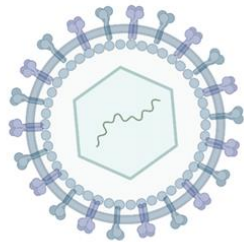
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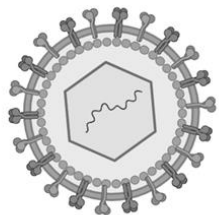
Bahagian virus/mikroorganisma yang boleh dijadikan sebagai material vaksin

Approaches to Viral Vaccine Development

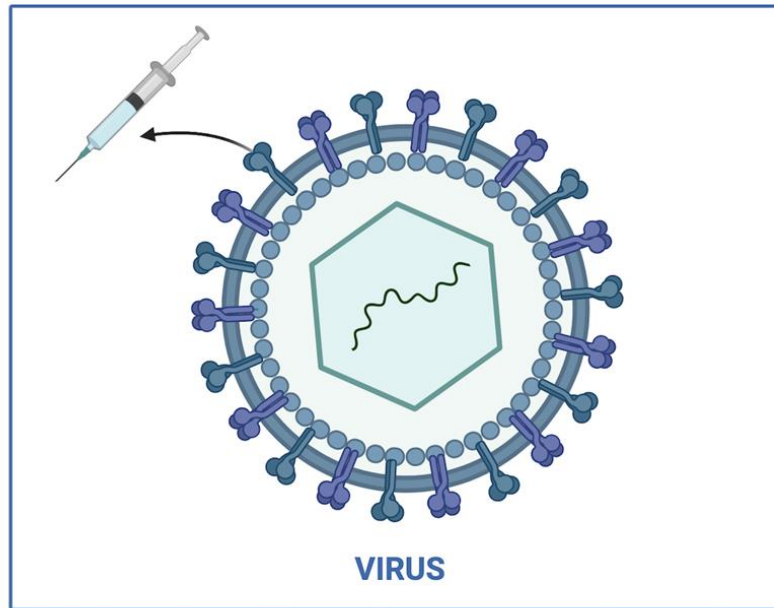
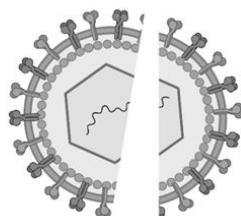
a. Live attenuated



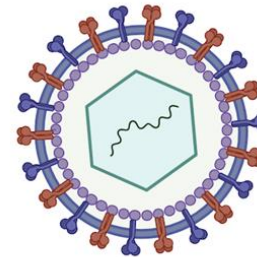
b. Whole inactivated



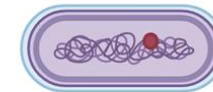
c. Split inactivated



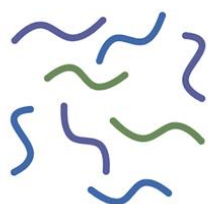
i. Recombinant viral vectors



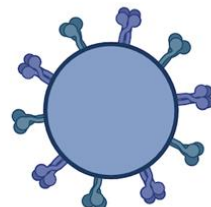
h. Recombinant bacterial vectors



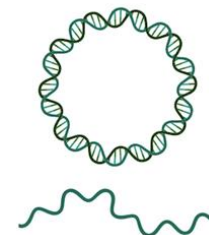
d. Synthetic peptides



e. Virus-like particles



f. DNA or RNA
























g. Recombinant subunits



Perbandingan vaksin

How some of the Covid-19 vaccines compare

Company	Type	Doses	Storage
 Oxford Uni-AstraZeneca	Viral vector (genetically modified virus)	x2 	 2 to 8°C (6 months)
 Moderna	RNA (part of virus genetic code)	x2 	 -25 to -15°C (7 months)
 Pfizer-BioNTech	RNA	x2 	 -80 to -60°C (6 months)
 Gamaleya (Sputnik V)	Viral vector	x2 	 -18.5°C (liquid form) 2 to 8°C (dry form)
 Sinovac (CoronaVac)	Inactivated virus	x2 	 2 to 8°C
 Novavax	Protein-based	x2 	 2 to 8°C
 Janssen Johnson & Johnson	Viral vector	x1 	 2 to 8°C (3 months)

Source: UK government, Reuters



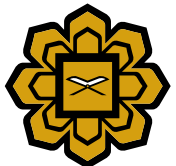
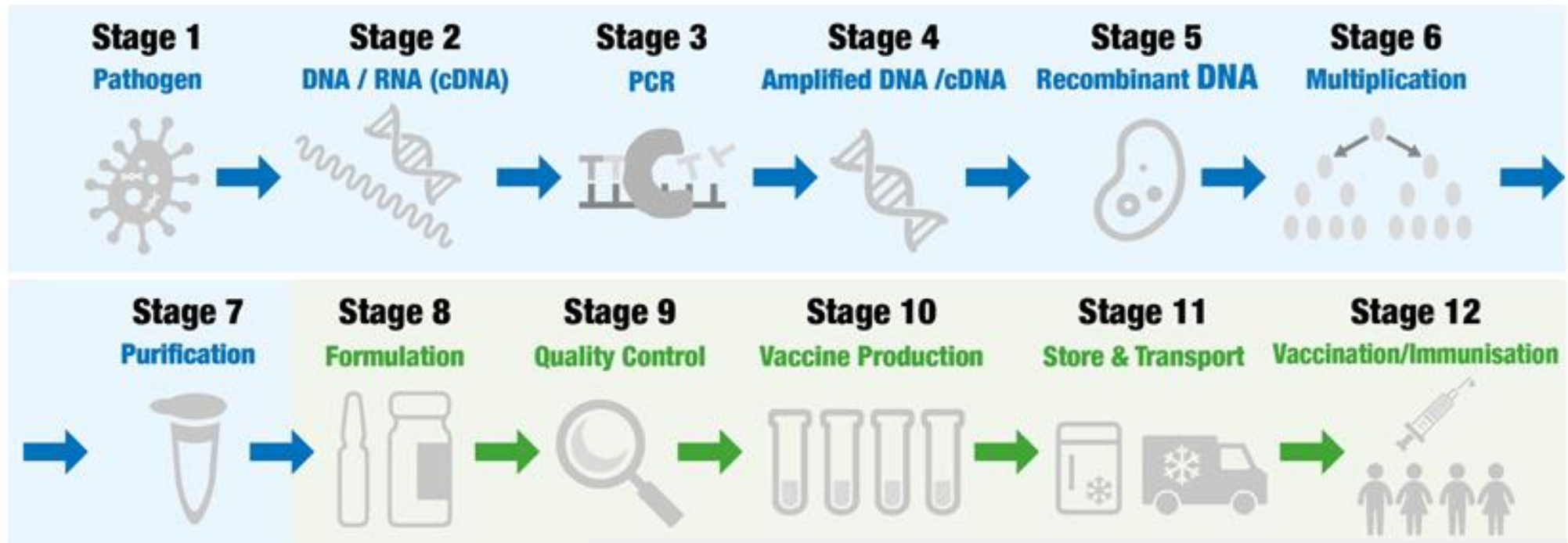
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<https://www.bbc.com/news/world-europe-56275342>

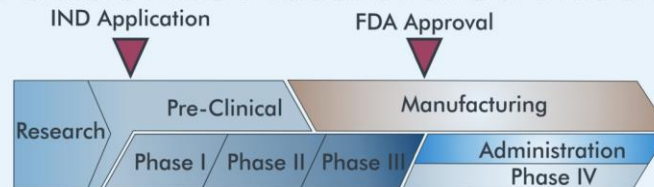
Pembuatan Vaksin Secara Am

VACCINE RESEARCH & DEVELOPMENT - FROM START TO FINISH



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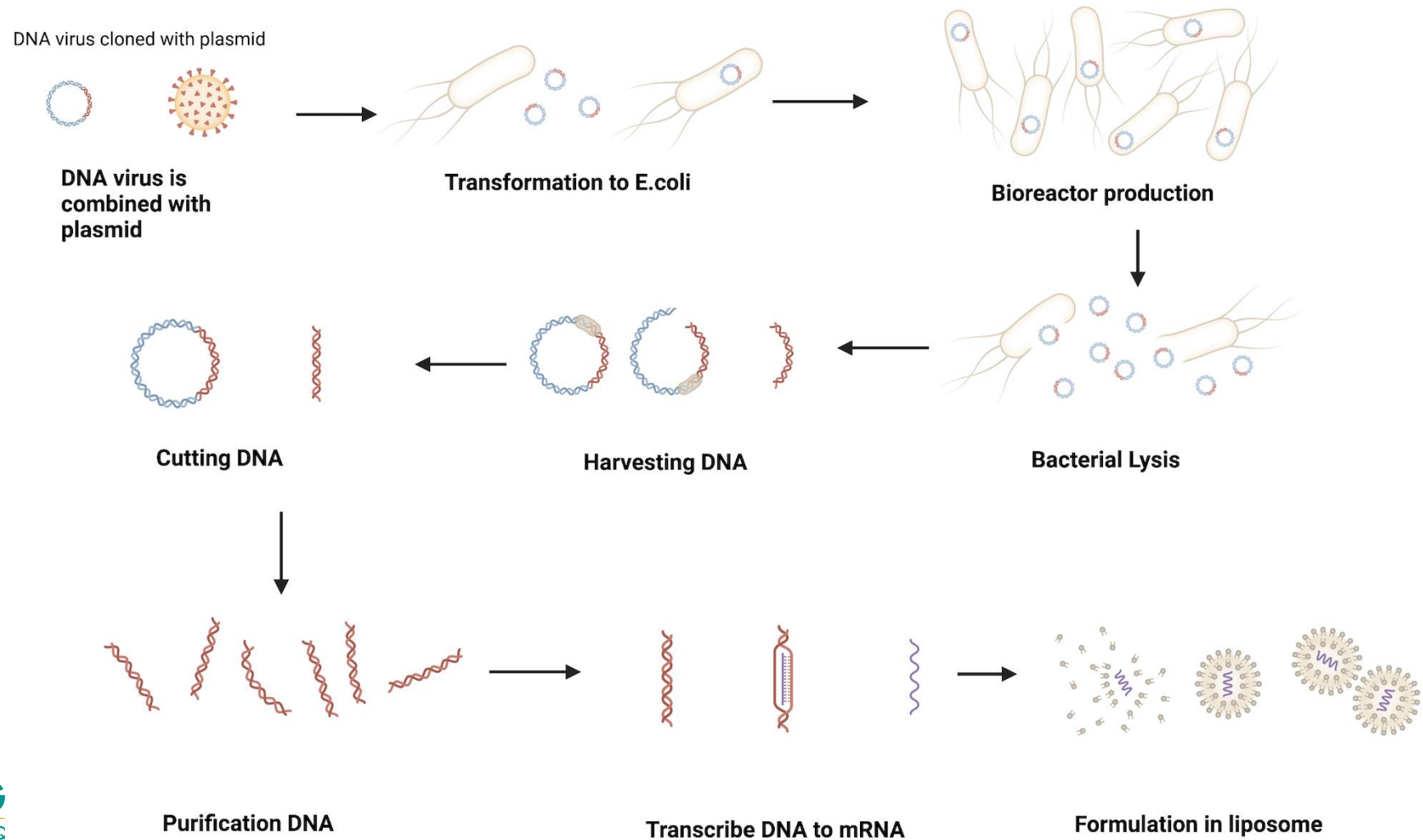
Pandemic Accelerated Model



€93 Billion Spent By Public Sector On COVID Vaccines and Therapeutics in 11 Months, Research Finds

Health Systems 12/01/2021 • Madeline Hoecklin

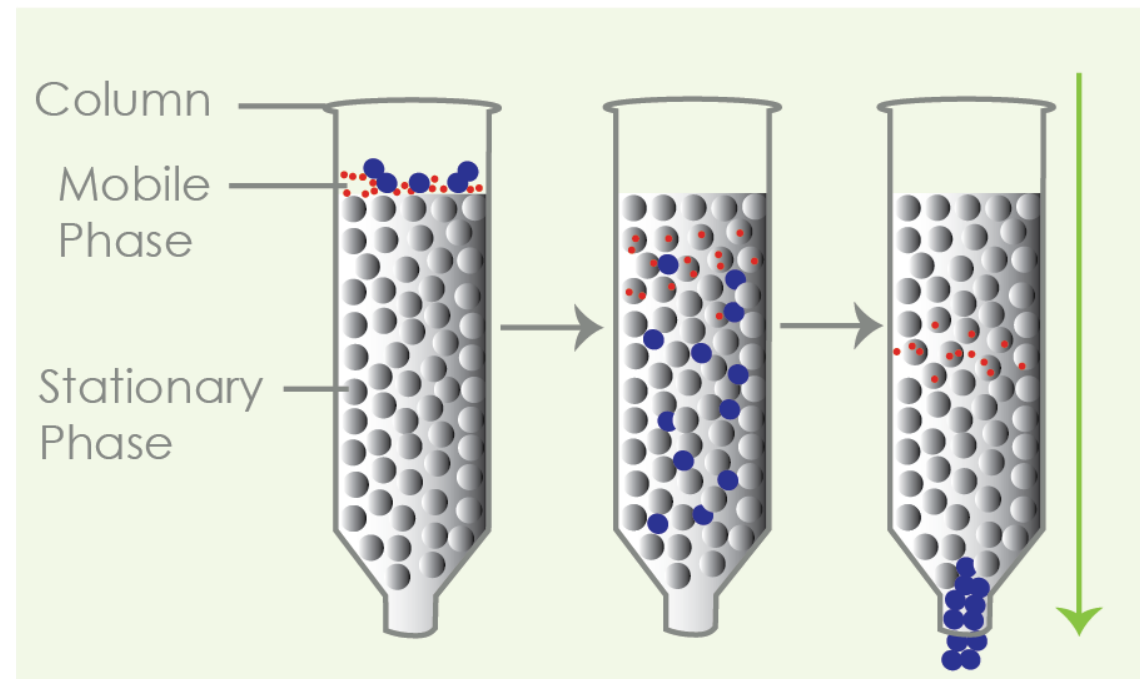
Kaedah penghasilan mRNA



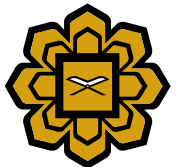
Penulenan vaksin

- Fasa diam berupa penyerap, penyah cas, hydrophobic interaction, mixed mode, size exclusion, atau berasaskan affinity.
- Fasa bergerak (pelarut air/buffer)
- Semua bahan akan yang tidak diperlukan akan diasingkan dan hanya vaksin tulen sahaja yang akan di gunakan

Column Chromatography



Vaksin tulen

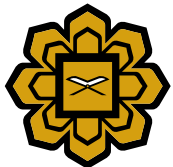


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Komponen vaksin dalam formulasi

- Virus/bahagian dari virus/produk virus
- Adjuvant
 - Bahan kimia untuk meningkatkan keberkesanan vaksin, contoh: aluminium salts (hydroxide, phosphate)
- Penghantaran (delivery)
 - Emulsi, liposome (kolesterol dan fosfolipid) atau
 - Adenovirus carrier
- Air injeksi



Pfizer Biontech vaccine-mRNA vaccine

- **DNA dihasilkan dengan bakteri Escherichia coli**
- **Bahan aktif:**
 - mRNA (messenger ribonucleic acid)
- **Pembawa vaksin**
 - ((4-hydroxybutyl)azanediyl)bis(hexane-6,1-diyl)bis(2-hexyldecanoate) (ALC-0315)
 - 2-[(polyethylene glycol)-2000]-N,N-ditetradecylacetamide (ALC-0159)
 - Distearoylphosphatidylcholine (DSPC)
 - Cholesterol
- **Bahan penyokong**
 - potassium chloride
 - monobasic potassium phosphate
 - sodium chloride
 - dibasic sodium phosphate dihydrate
 - sucrose
 - sterile water for injection

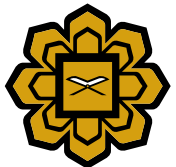


Pembawa vaksin



AstraZeneca-Recombinant vaccine

- Virus dibiakan dengan HEK-293 cells (human cells)
- **Bahan aktif:**
 - recombinant glycoprotein
- **Bahan penyokong:**
 - L-histidine (penstabil)
 - L-histidine hydrochloride monohydrate
 - Magnesium chloride hexahydrate
 - Polysorbate 80 (E 433) (surfaktan)
 - Ethanol
 - Sucrose
 - Sodium chloride
 - Disodium edetate dihydrate
 - Water for injections



Sinovac- inactivated virus

- Virus dibiakkan dengan Vero cells
- **Bahan aktif:**
Inactivated SARS-CoV-2 antigen
- **Adjuvant:**
Aluminum hydroxide
- **Bahan-bahan penyokong:**
Disodium hydrogen phosphate
Sodium dihydrogen phosphate
Sodium chloride

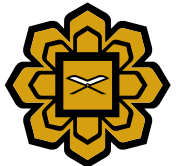


Isu Halal

- Halal isu dalam pengasilan vaksin ialah dalam penggunaan **enzim** dalam pengkulturan sel, akan tetapi ada juga enzim yang bukan berunsur porcine tetapi dari bakteria.
- Jika ada unsur enzim dalam penghasilan vaksin, telahpun dinyahkan dalam proses **penulinan** menggunakan kaedah “kromatografi” yang bersifat menyerap bahan bahan tersebut.
- Sedangkan untuk stabilizer, buffer dan adjuvants tiada isu kehalalan yang perlu di ragukan.



TERIMA KASIH



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