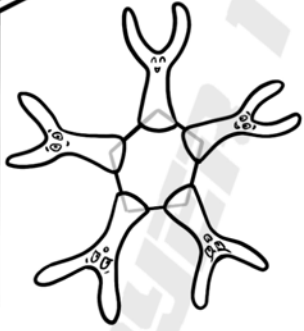


ATTACK OF THE ANTIBODIES

Multiplayer Mode

CHOOSE YOUR PLAYER

IgM



Stats:

Actually 5 antibodies bound together as 1! IgM is the first antibody seen early in infection!

IgG



Stats:

Stops toxic molecules and can coat germs! Most common antibody in the blood

IgA



Stats:

Found in the gut, spit, tears and lungs! Can be found in pairs!

IgE



Stats:

Found when people have allergic reactions not as common as the others!

IgD



Stats:

Found on the surface of an immune cell called a B cell!

LEVEL SELECTED: **INCOMING INFECTION!**

MISSION OBJECTIVES:

As antibodies, you must work together to complete the following tasks:

Neutralise: Stick to germs (and to the toxins they make) to stop them entering cells! As antibodies you can group germs together to make for the immune system easier to target!

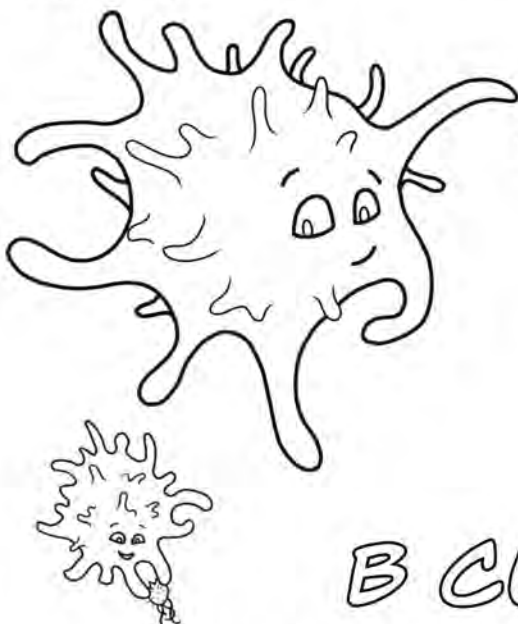
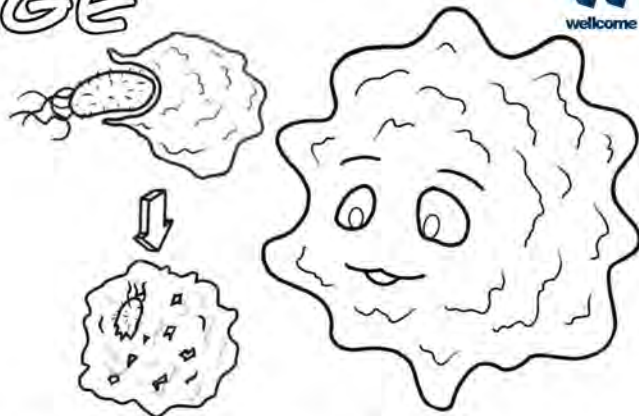
Opsonise or 'coat': Cover the surface of the incoming germ to help immune cells eat or 'engulf' it!

Initiate ADCC: This stands for ANTIBODY-DEPENDENT CELLULAR CYTOTOXICITY! This means you help direct the germ towards immune cells by sticking to the germs surface! These immune cells will then kill the germ with specialised toxic molecules!

Activate complement: Complement is your comrade- these proteins can independently punch holes in germ to kill them! They will also you help a attract immune cells to the germ!

MACROPHAGE

THESE IMMUNE CELLS EAT OR 'ENGULF' VIRUSES AND BACTERIA TO HELP TO STOP THE SPREAD OF INFECTION EARLY ON! THESE ARE SOME OF THE FIRST CELLS ON THE SCENE WHEN A GERM INVADES!



DENDRITIC CELL

THESE CELLS ALSO ENGULF GERMS! BUT ONCE THAT GERM IS CHEWED UP, DENDRITIC CELLS PRESENT A SMALL PART OF IT, CALLED A PEPTIDE, ON THEIR CELL SURFACE! T CELLS RECOGNISE THIS PEPTIDE AS A DANGER SIGNAL WHICH KICK STARTS THE FIGHT AGAINST THE INFECTION!

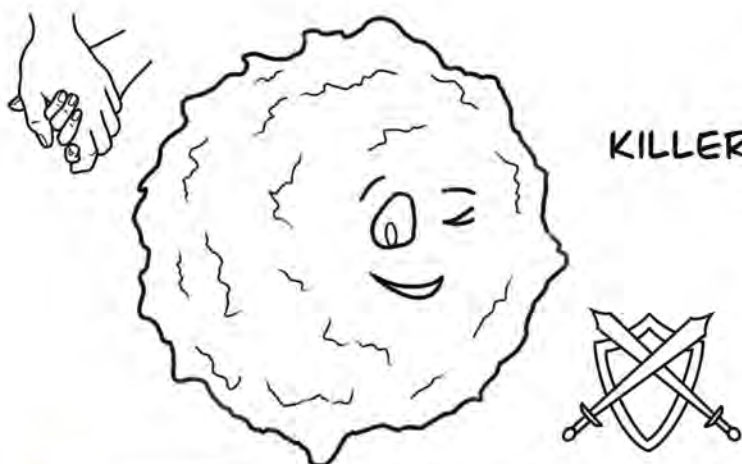
B CELL

B CELLS MAKE ANTIBODIES! THESE ANTIBODIES ARE UNIQUE, Y-SHAPED MOLECULES THAT CAN STICK TO PROTEIN ON THE GERM'S SURFACE! THIS CAN STOP GERMS STICKING TO OUR CELLS AND DRAWS ATTENTION TO THE GERM AND HELPS IMMUNE CELLS FIND IT, MAKING IT EASIER FOR THE BODY TO STOP THE INFECTION!

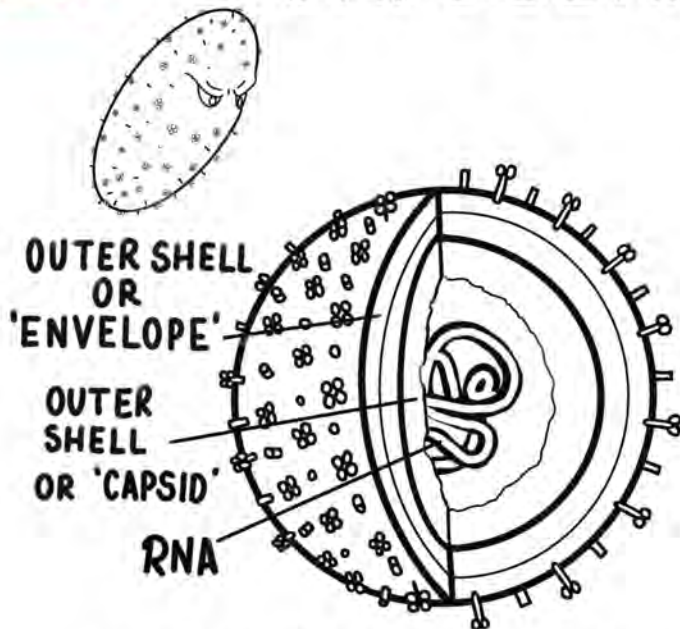


T CELL

THERE ARE TWO TYPES OF T CELLS, KILLER AND HELPER CELLS! KILLER T CELLS DESTROY ALREADY INFECTED CELLS, WHEREAS T HELPER CELLS DO JUST THAT- HELP OTHER CELLS, LIKE B CELLS, DO THEIR JOB! T CELLS CAN ALSO HAVE MEMORY, TO STOP THE SAME GERM INVADING TWICE!



INFLUENZA VIRUS OR 'FLU'



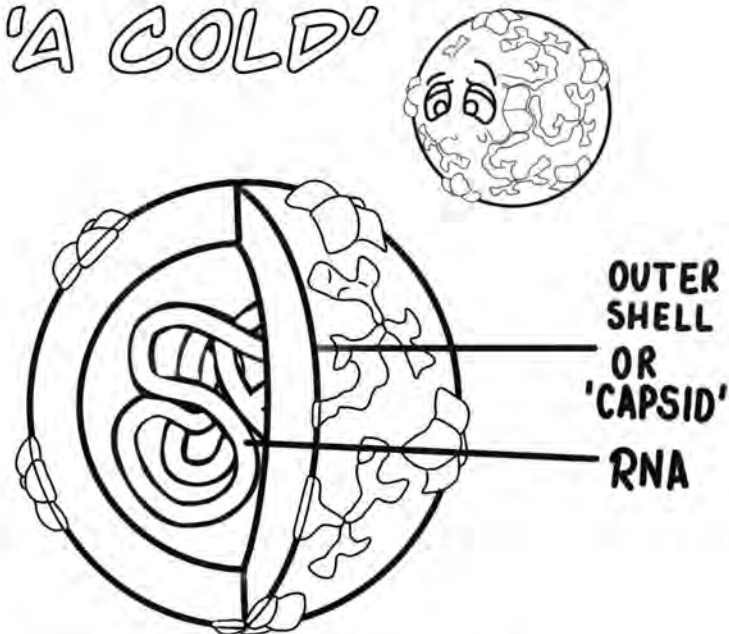
SYMPTOMS: RUNNY NOSE, FEVER, HEADACHE, TIREDNESS, MUSCLE PAIN

HOW TO STOP IT SPREADING:
CATCH IT, BIN IT, KILL IT!
KILL THE VIRUS BY WASHING YOUR HANDS!!

RHINOVIRUS OR 'A COLD'

SYMPTOMS: RUNNY OR BLOCKED NOSE, SORE THROAT, SNEEZING/ COUGHING

HOW TO STOP IT SPREADING:
CATCH IT, BIN IT, KILL IT!
KILL THE VIRUS BY WASHING YOUR HANDS!!

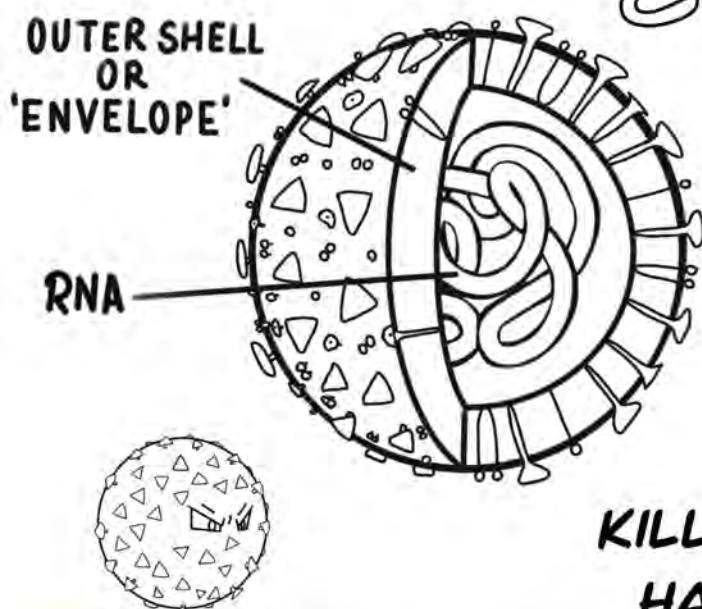


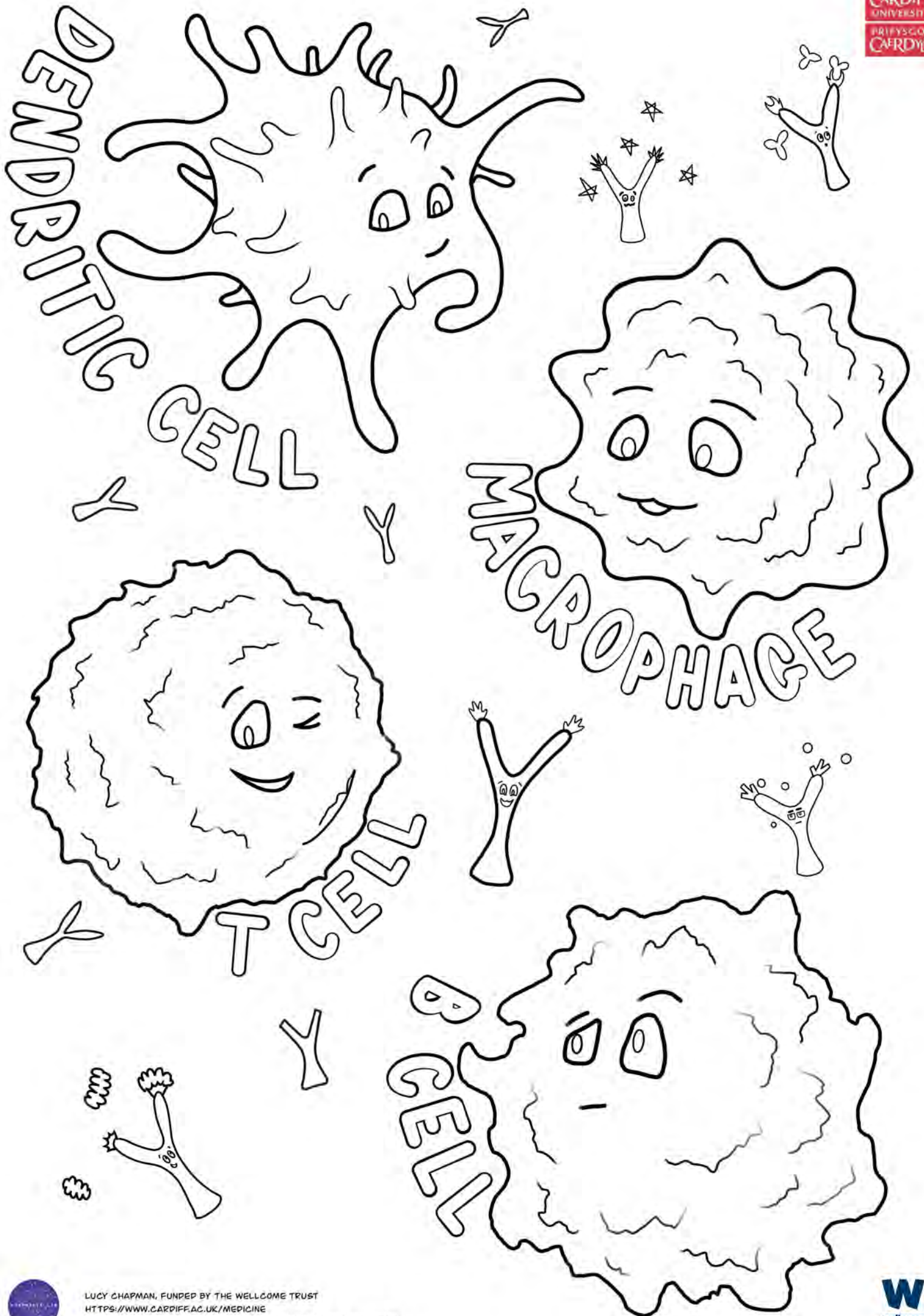
CORONAVIRUS

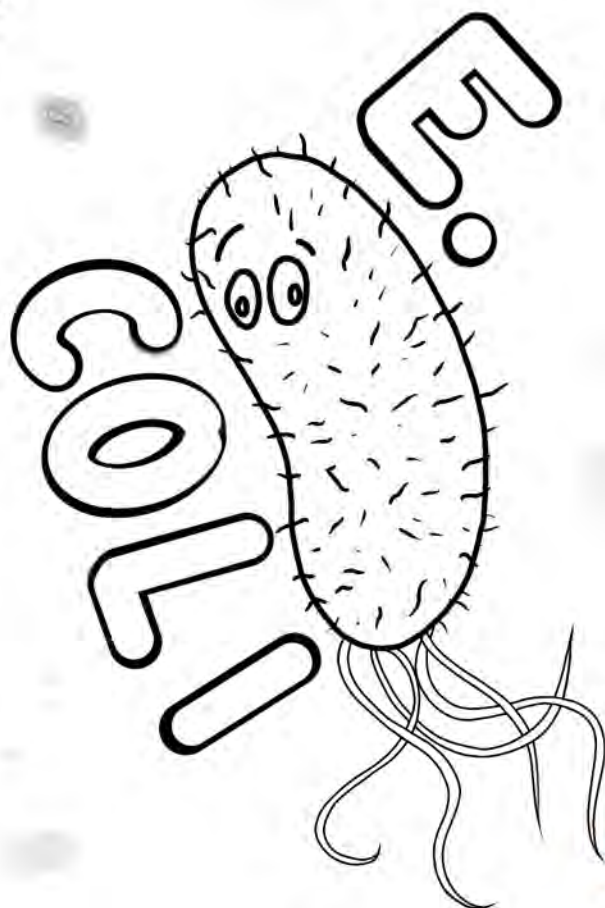
SYMPTOMS: FEVER, SHORTNESS OF BREATH, DRY COUGH, LACK OF TASTE AND SMELL, HEADACHE

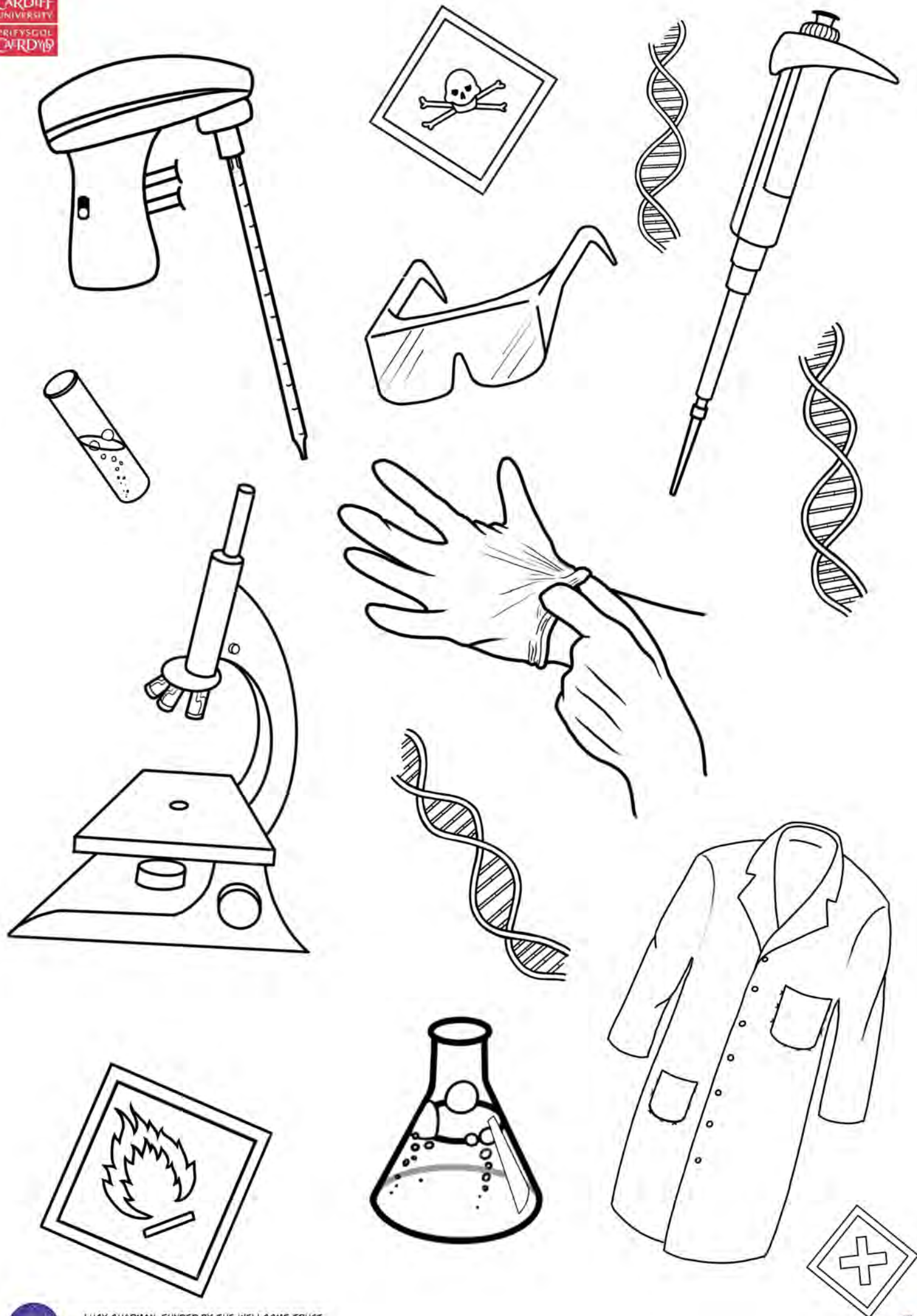
HOW TO STOP IT SPREADING:
CATCH IT, BIN IT, KILL IT!

KILL THE VIRUS BY WASHING YOUR HANDS MORE OFTEN AND FOR AT LEAST 20 SECS!!



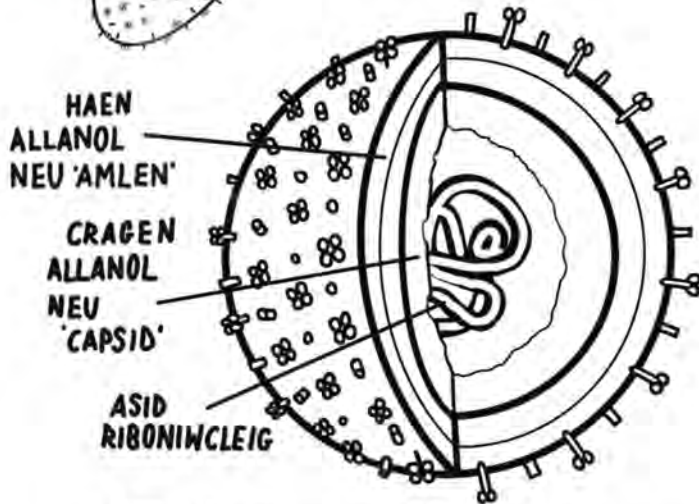






Firws ffliw neu ffliw

Symptomau: trwyn yn rhedeg, twymyn, pen tost, blinder a poen y cyhyrau



Sut i'w atal rhag lledaenu:

Dalwch ef, biniwch ef, laddwch ef!!
Laddwch y firws trwy olchi'ch dwylo!

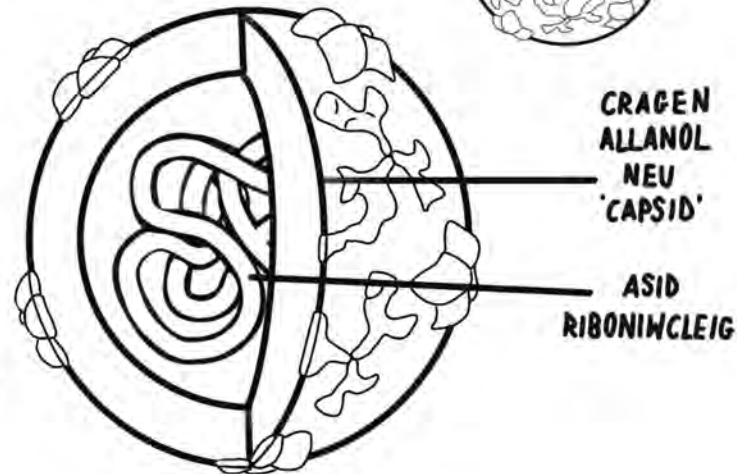
Rhinofirws neu 'annwyd'



Symptomau: trwyn yn rhedeg neu wedi ei rhwystro, gwddf tost, tisian/pesychu

Sut i'w atal rhag lledaenu:

Dalwch ef, biniwch ef, laddwch ef!!
Laddwch y firws trwy olchi'ch dwylo!

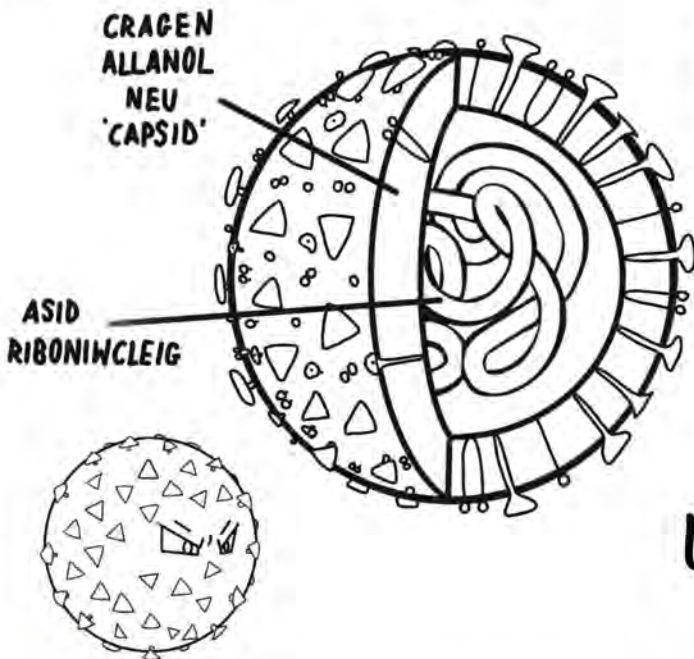


Coronafeirws

Symptomau: twymyn, prinder anadl, peswch sych, diffyg blas ac arogl, pen tost

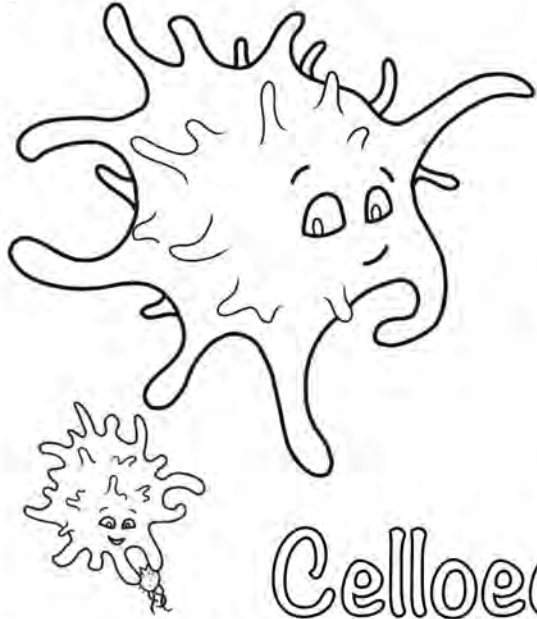
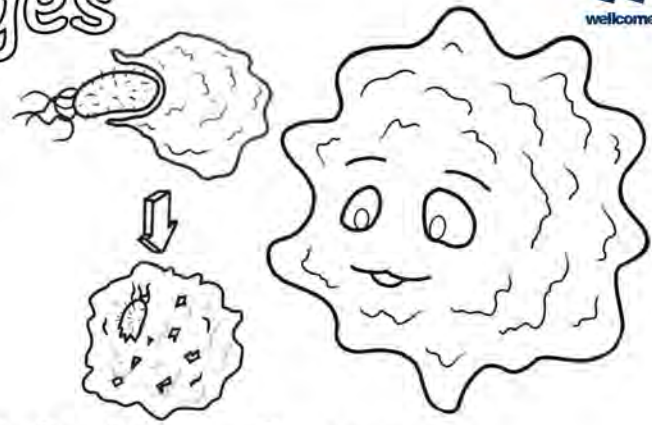
Sut i'w atal rhag lledaenu:

Dalwch ef, biniwch ef, laddwch ef!!
Laddwch y firws trwy olchi'ch dwylo am o leia 20 eiliad!!



Macrophages

Mae'r celloedd system imiwnedd hyn yn bwyta neu'n amlyncu firysau a bacteria i helpu i atal yr haint rhag lledaenu yn gynnar! Dyma rhai o'r celloedd cyntaf i gyraedd pan fydd germ yn goresgyn!

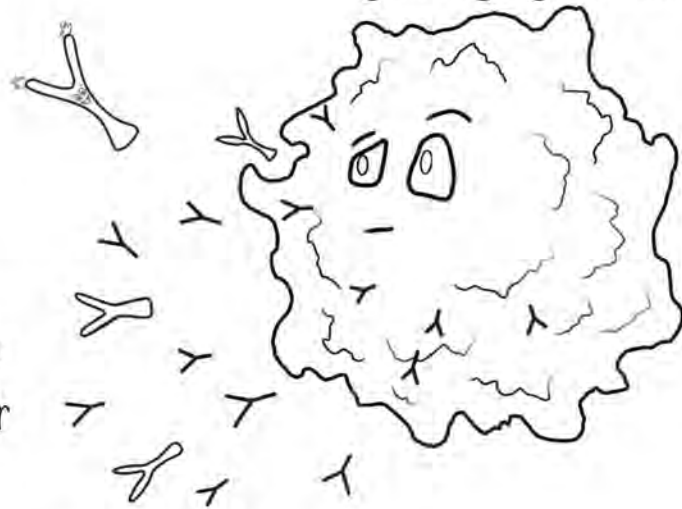


Celloedd dendritig

Mae'r celloedd hyn hefyd yn amlyncu germau! Ond unwaith mae'r germ wedi cael ei gnoi, mae'r celloedd dendritig yn cyflwyno rhan bach ohono, o'r enw peptid, ar eu wyneb! Mae celloedd T yn cydnabod y peptid hwn fel signal perygl, ac mae hwn yn dechrau'r brwydr yn erbyn yr haint!

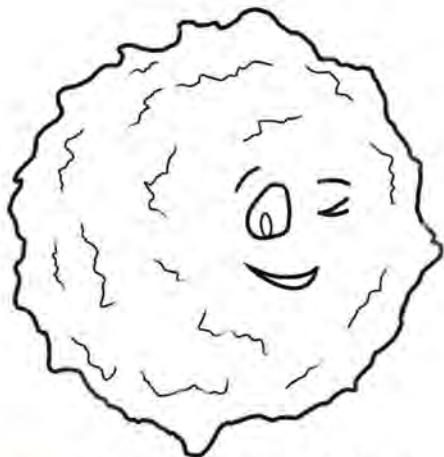
Celloedd B

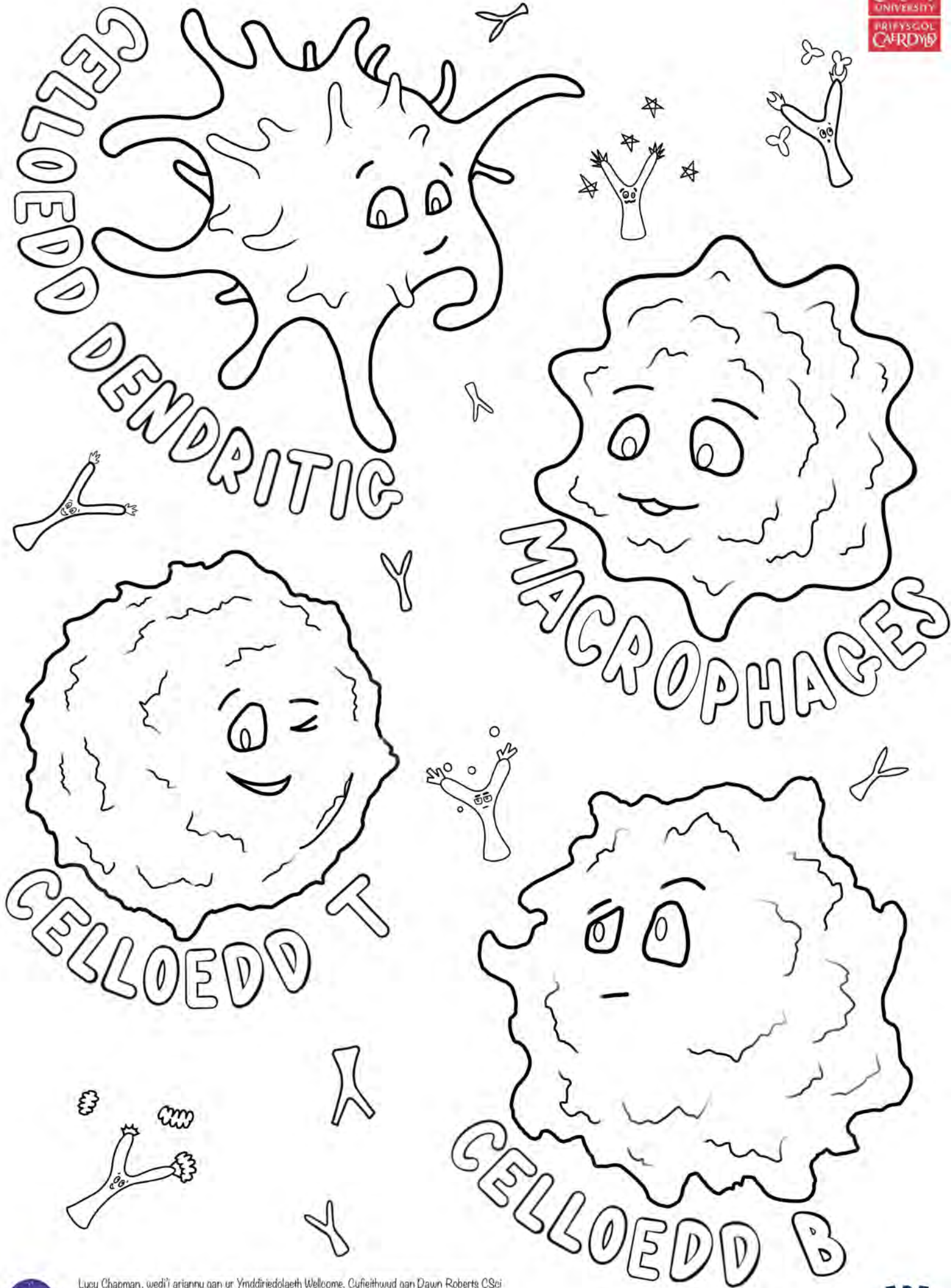
Mae celloedd B yn gwneud gwrthgyrff! Mae'r gwrthgyrff hyn yn foleciwl siâp Y unigryw, sy'n medru glynu i brotein ar wyneb y germau! Mae hwn yn atal y germau rhag glynu ar ein celloedd a thynnu sylw at y germ en hun. Mae hwn yn helpu'r celloedd imiwnedd i dodd o hyd iddo, a gwneud hi'n rhwyddach i'r corff atal yr haint!

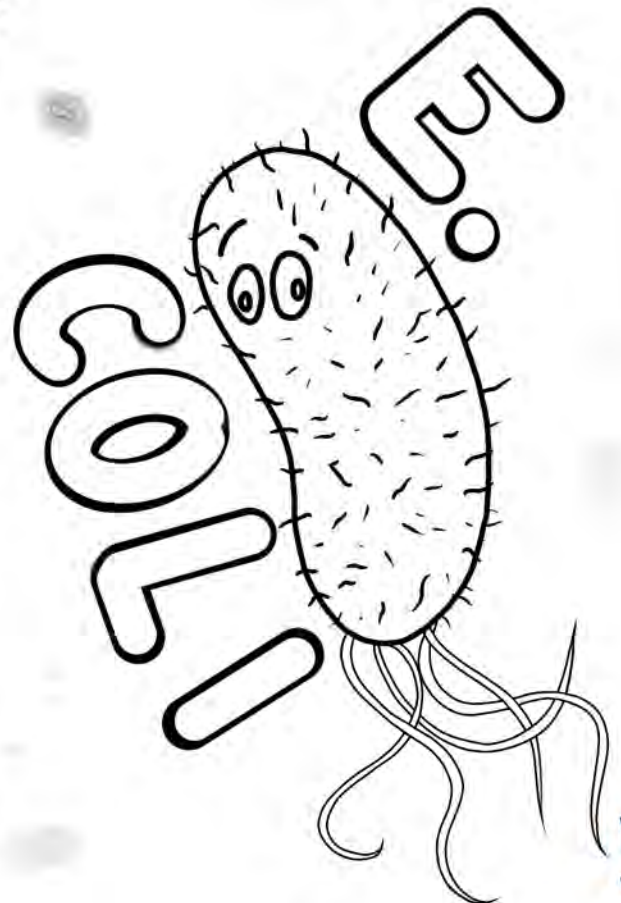
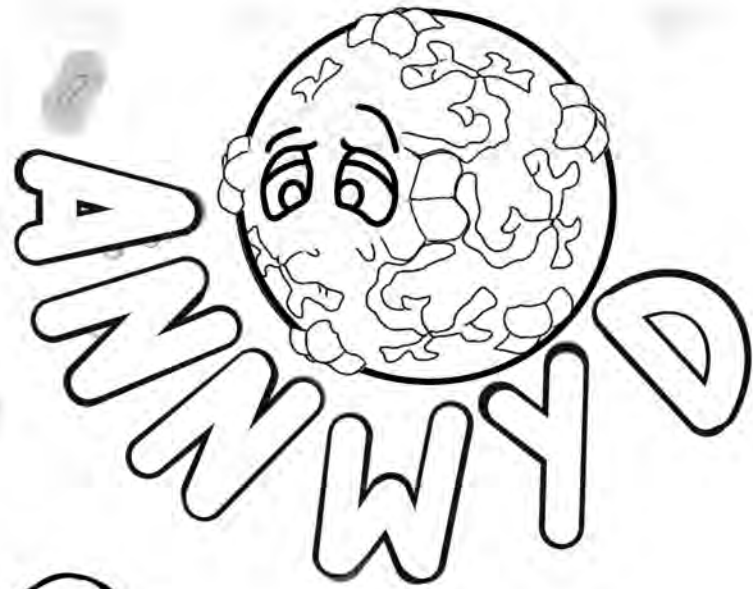


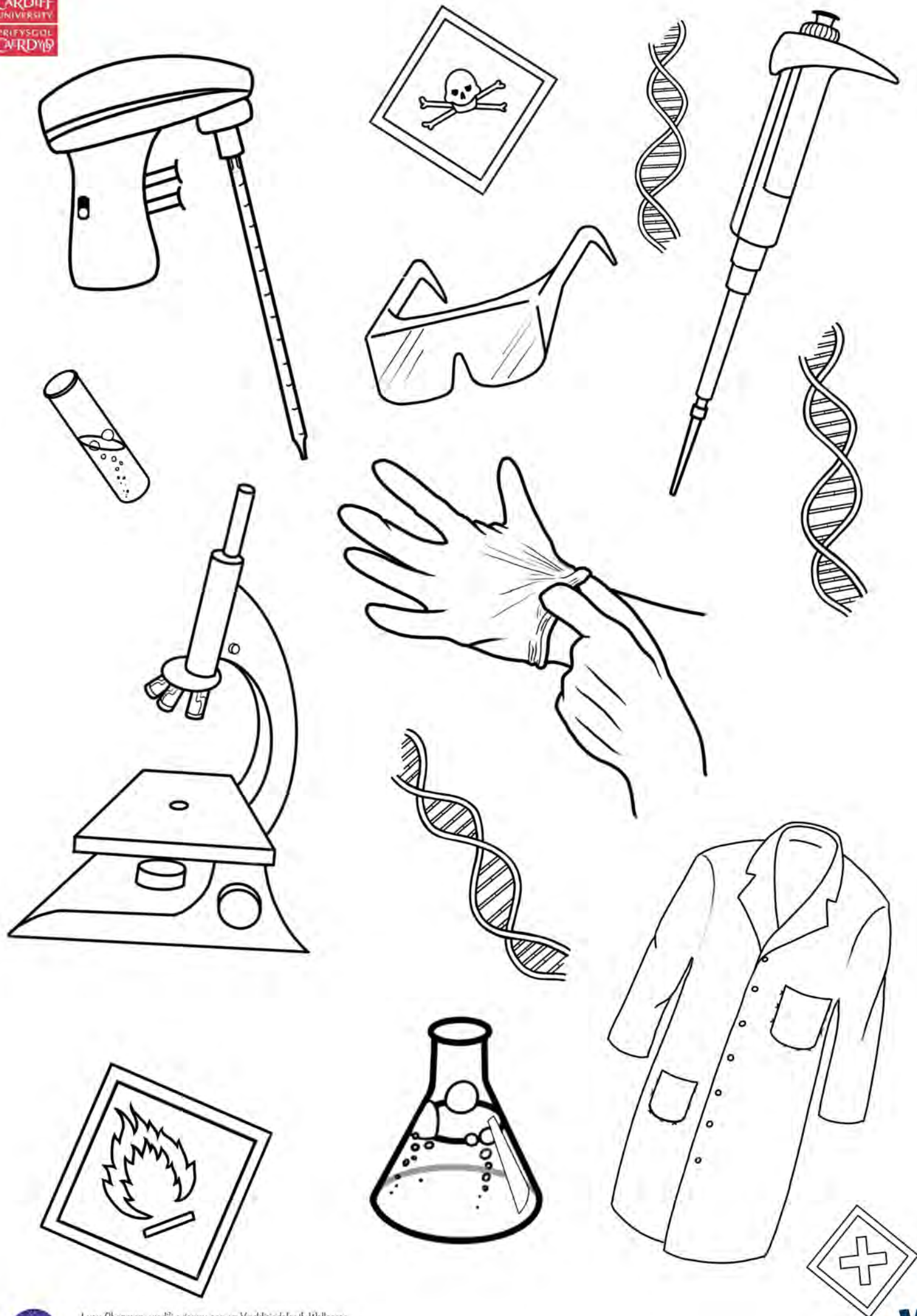
Celloedd T

Mae dau fath o gelloedd T, celloedd lladdwyr a chynorthwyydd! Mae celloedd lladdwyr T yn dinistrio celloedd wedi eu heintio, ond mae celloedd cynorthwyydd T yn gwneud hynny'n union- helpu celloedd eraill, fel celloedd B, i wneud eu gwaith! Mae gan rhai celloedd T chof, i atal yr un germ rhag goresgyn ddwywaith!









Krebs-immunevasion

Normalerweise kann das Immunsystem deines Körpers eine Krebszelle einfach erkennen und sie schnell beseitigen!



Aber manchmal können sich Krebszellen so schnell teilen, dass das Immunsystem nicht mehr mithalten kann und Schwierigkeiten hat, den Krebs unter Kontrolle zu behalten...



Die Lage wird nur noch schlimmer, wenn der Krebs die Immunzellen blind macht oder sie so erschöpft, dass sie nicht länger normal funktionieren können! Das bedeutet, dass der Krebs dann vom Immunsystem unerkannt wachsen kann...

Immuntherapie

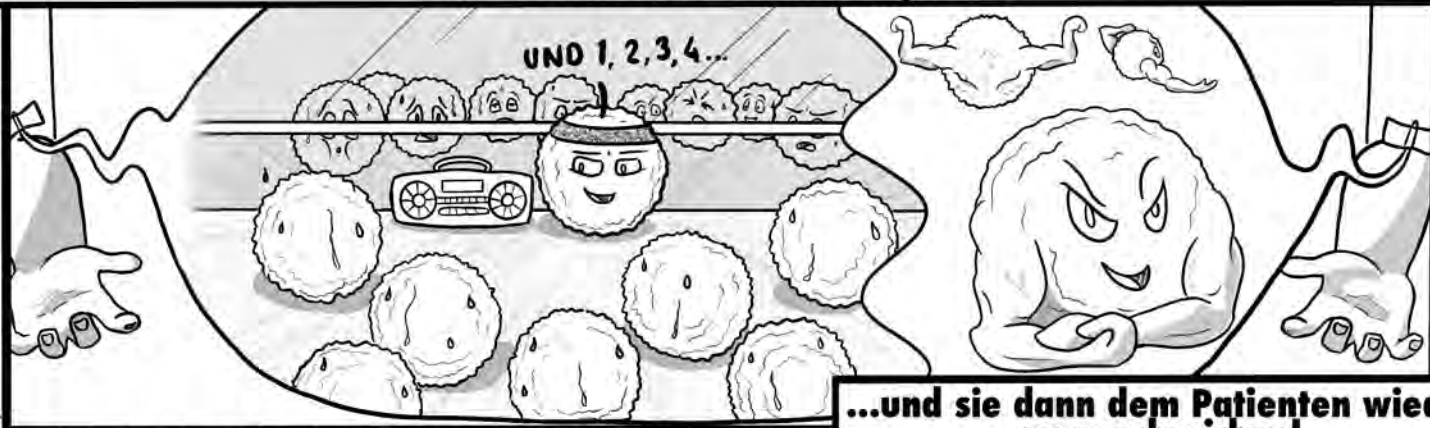
Hier können Wissenschaftler helfen! Ein Weg, wie sie dies tun, ist erschöpften Immunzellen wieder zu voller Gesundheit zu verhelfen indem sie CHECKPOINT-INHIBITOREN benutzen!



Ein andere Weg, wie Wissenschaftler helfen, ist mit Hilfe Von Vakzinen, die das Immunsystem trainieren, Krebszellen besser zu sehen!

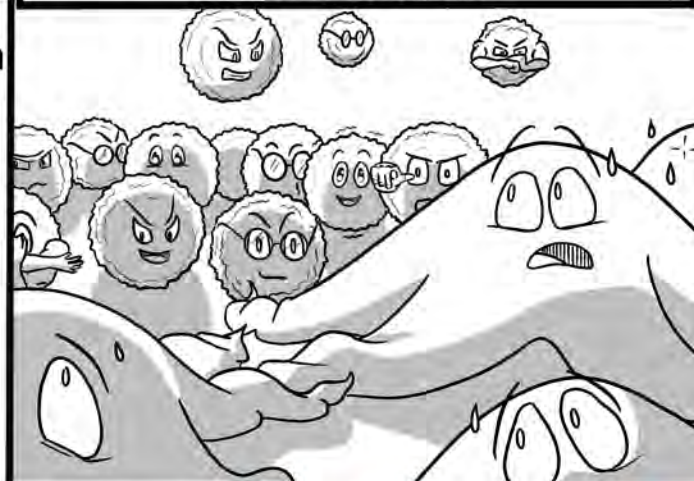


Wissenschaftler verwenden auch T-ZELL THERAPIE, ein Prozess bei dem Immunzellen (T-Zellen) aus dem Patienten entnommen werden, um ihnen beizubringen, stärker zu sein und besser Krebs zu bekämpfen...



...und sie dann dem Patienten wieder zu verabreichen!

Mit diesel und anderen Techniken können Wissenschaftler den Patienten helfen, die Oberhand gegen den Krebs zu gewinnen!



FIRYSAU ONCOLYTIG!

Esboniad

Ein nôd yw hyfforddi firyasau i chwilio am a dinistrio celloedd cancer yn unig, heb niweidio celloedd iach gerllaw...



Gallwn wneud hyn drwy ddefnyddio adenofeirysau, eu haddasu i atal rhag achosi niwed neu afiechyd!

GRRR!!!

Rydym yna yn addysgu'r feirws i chwilio'n benodol am gelloedd cancer

CANCER CORFF = DRWG DA

EISTEDD!

EISTEDD!

Gallwn greu feirws ddf sydd yn barod i gael ei hyfforddi er daioni...



Pan fydd feirws yn darganford celloedd cancer gall gyflawni dwy weithred; lladd y celloedd cancer yn syth hefyd rhybuddio'r system imiwnedd i leoliad y tiwmor!

Mae hyn yn rhoi hwb i'r corff i ddechrau'r frwydr yn erbyn cancer!

FIRYSAU ONCOLYTIG!

Esboniad

Ein nod yw hyfforddi firyasu i chwilio am a dinistrio celloedd cancer yn unig, heb niweidio celloedd iach gerllaw...



Gallwn wneud hyn drwy ddefnyddio adenofeirysau, eu haddasu i atal rhag achosi niwed neu afiechyd!

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ONCOLYTIC VIRUSES!

Explained

Our goal is to train viruses to seek and destroy **CANCER CELLS**, but to not harm healthy cells nearby...



We do this by taking a virus called **ADENOVIRUS** and taming it to stop it causing damage or disease!



We then teach this virus to search for cancer cells specifically...

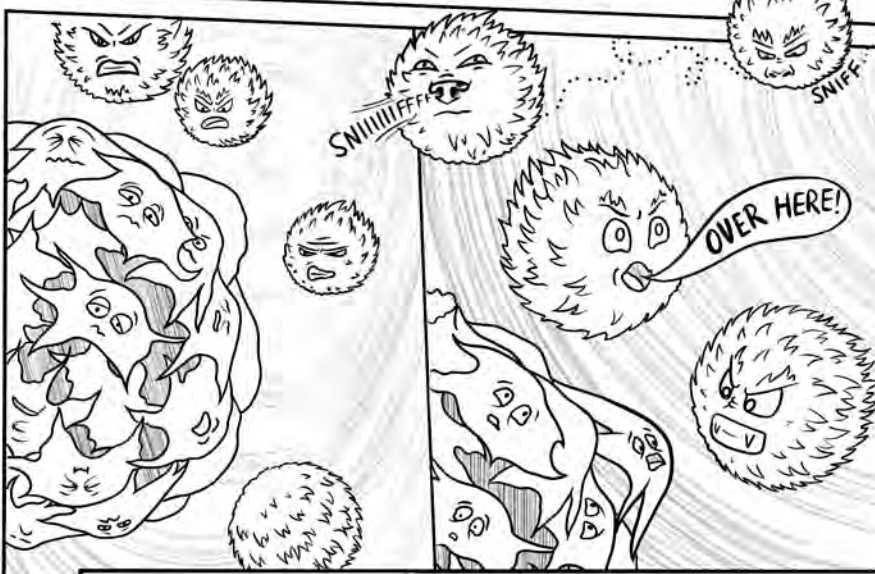
CANCER SELF
BAD GOOD



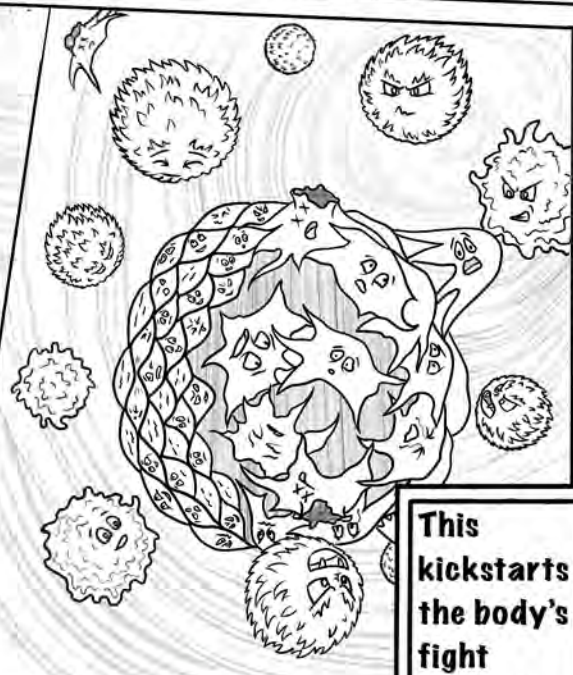
This creates a 'domesticated' virus and is a blank slate ready to be trained for good!



When the virus finds the cancer cells it can do two things: it can kill the cancer cell directly, and it can alert the immune system to bring its attention to the tumour!



This kickstarts the body's fight against the cancer!



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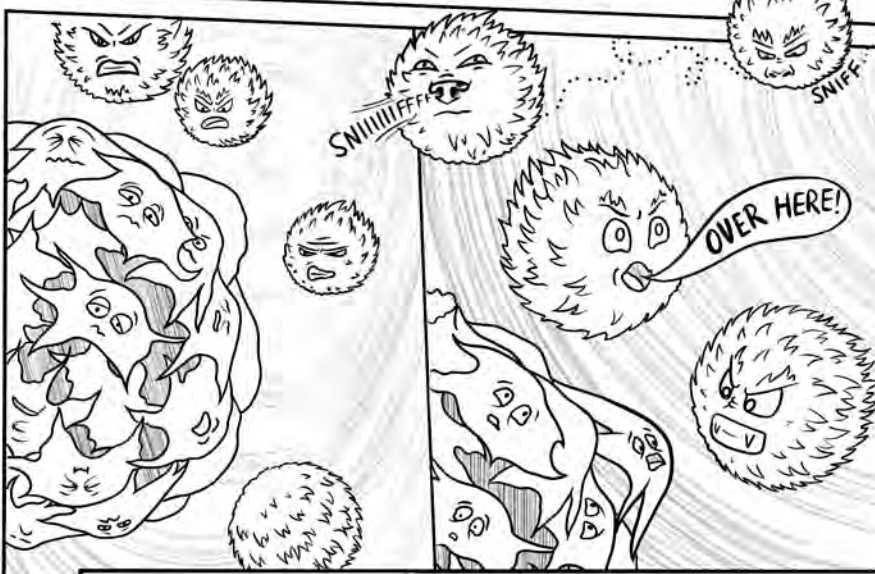
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ecmc

CANCER RESEARCH UK

Lucy Chapman, funded by ECMC
<https://www.cardiff.ac.uk/people/view/126626-parker-alan>
<https://www.cardiff.ac.uk/medicine>
 Heading font: Birada! On DaFont

CANCER RESEARCH WALES
YMWIL CANCER CYMRU



tenovus cancer care



cardiff cancer centre

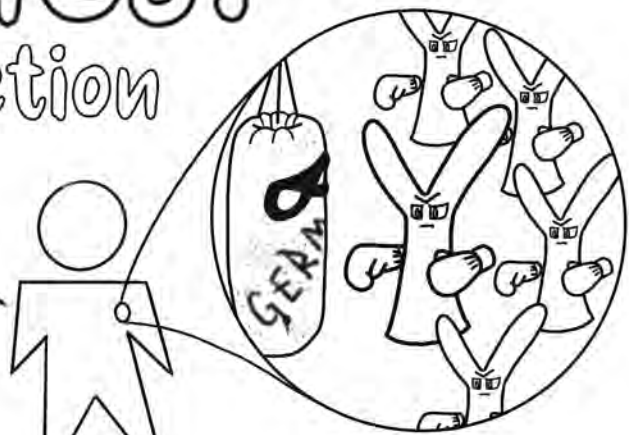


Vaccines:

an introduction

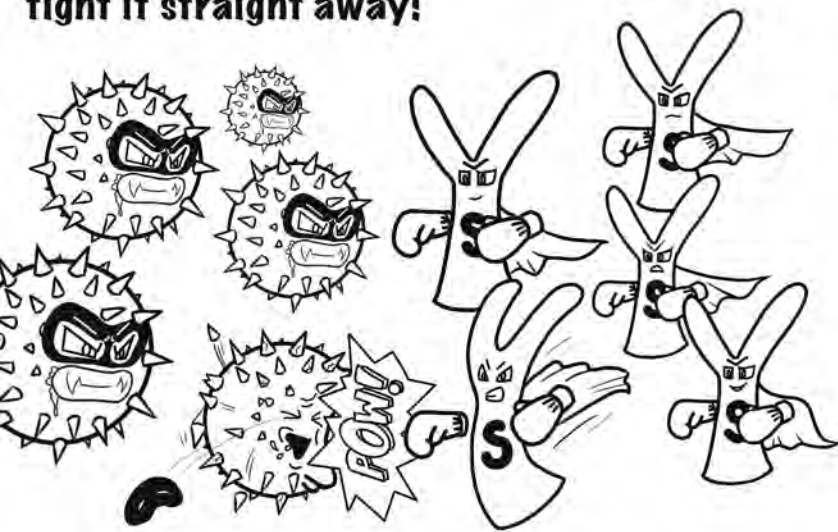
What is a vaccine?

A vaccine is a type of medicine that teaches your immune system to recognise certain germs, and is given to stop you getting sick! This way if your body sees the real germ your immune system can fight it straight away!



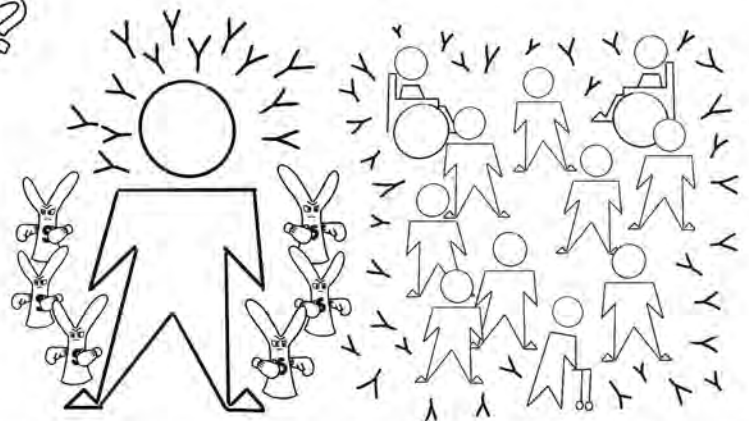
How do they work?

Vaccines contain dead or small pieces of the germ you want to be protected against. By giving you this harmless form of the germ, your immune system can create antibodies against it! Should your body come across the real thing, these ready-made antibodies can stick to the germ and flag it to the body for destruction, and stop the germ entering our cells!



Why are they important?

Vaccination stops you personally getting sick from nasty illnesses! Not only is this great for you, but it stops you passing it on to other people that are more vulnerable like the elderly and those that are unwell!



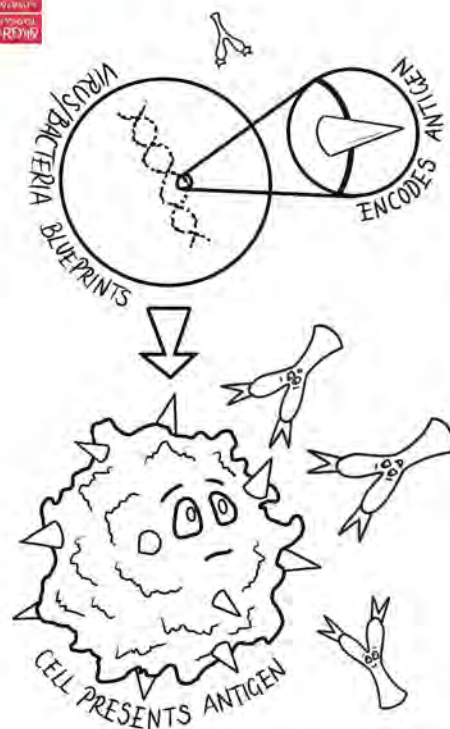
Do they protect me for life?

It depends on the vaccine and the disease you're protecting against! Some vaccines need to be given yearly (like the flu) because the virus mutates, so that vaccine isn't effective anymore! Other vaccines are only needed once, like HPV vaccine!

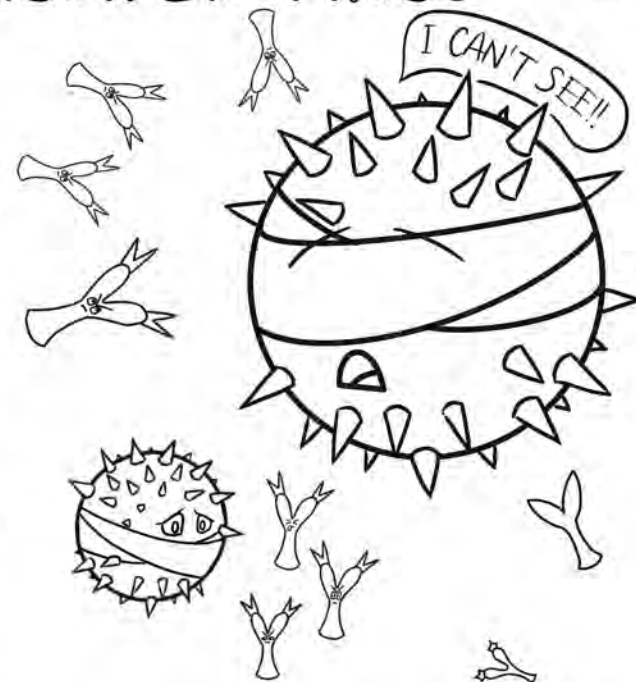


DNA/RNA LIVE ATTENUATED VIRUS

THIS VACCINE WORKS BY INSERTING PARTS OF BACTERIAL/ VIRAL DNA OR RNA MOLECULES (LIKE BLUEPRINTS) INTO OUR OWN IMMUNE CELLS! THIS BLUEPRINT IS CHOPPED UP BY OUR CELLS INTO SMALL PIECES CALLED ANTIGEN WHICH ARE PRESENTED ON THE CELLS SURFACE! OUR IMMUNE SYSTEM WILL SEE THIS ANTIGEN AND REMEMBER IT IN CASE WE GET INFECTED! DNA/RNA VACCINES CANNOT CAUSE DISEASE!



THIS VACCINE CONTAINS WHOLE VIRUS THAT CAN STILL GET INTO OUR CELLS, BUT IT HAS BEEN WEAKENED SO MUCH IT IS NOW HARMLESS! EXAMPLES OF THIS TYPE OF VACCINE ARE THE MMR AND CHICKENPOX VACCINES!



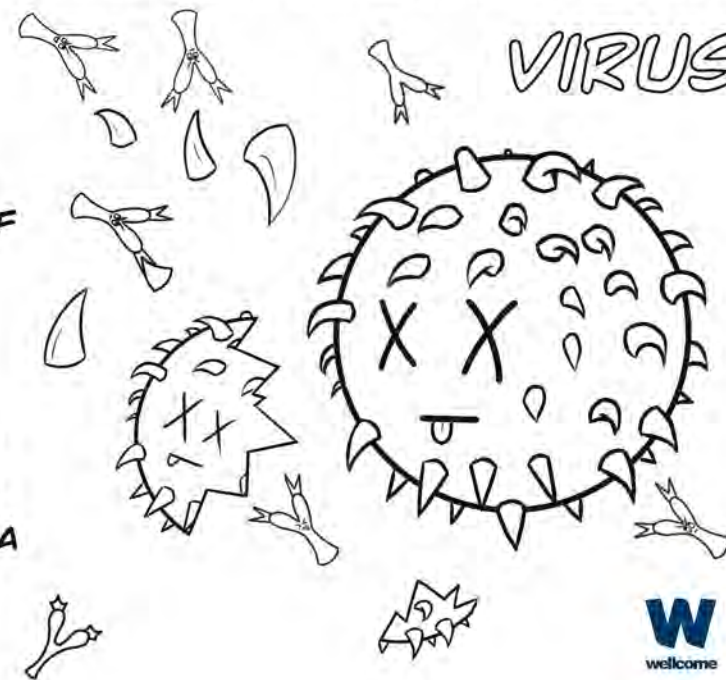
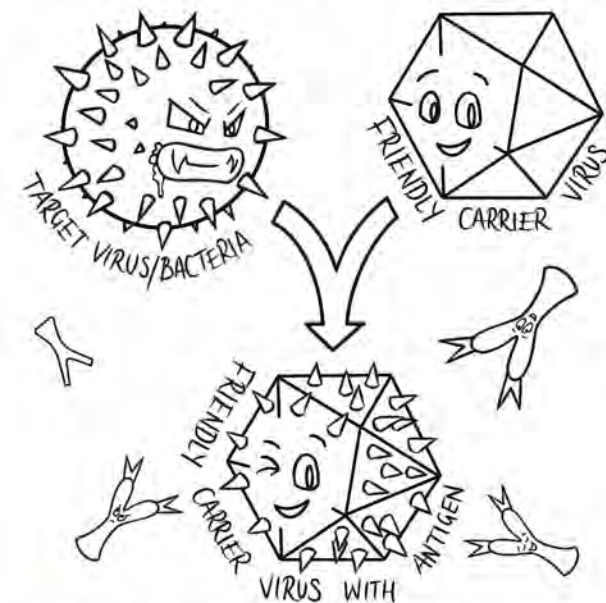
VECTOR-BASED

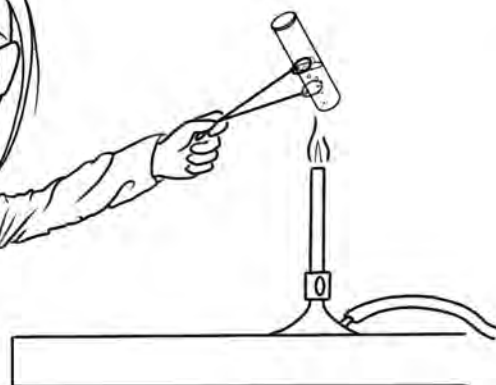
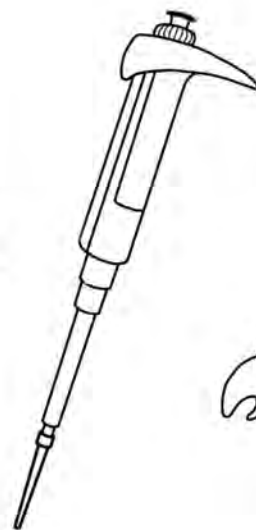
VACCINES

INACTIVED/DEAD VIRUS

THIS USES A VERY SAFE, WELL-UNDERSTOOD VIRUS AS A WAY TO CARRY AROUND A PIECE OF HARMFUL VIRUS/BACTERIA CALLED AN ANTIGEN! THE IMMUNE SYSTEM WILL SEE ONLY SEE THE ANTIGEN AS DANGEROUS! EXAMPLES ARE HPV, HEPATITIS B AND WHOOPING COUGH!

THIS HAS EITHER 'WHOLE' VIRUS/ BACTERIA WHICH HAVE BEEN KILLED OR SMALL PIECES OF THEM THAT HAVE BEEN KILLED TO INACTIVATE IT! NEITHER ARE ABLE TO CAUSE DISEASE! EXAMPLES INCLUDE THE FLU, HEPATITIS A AND MENINGITIS B!





Vaccines:

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A vaccine is a type of medicine that teaches your immune system to recognise certain germs, and is given to stop you getting sick. This way if your body sees the real germ your immune system can fight it straight away!

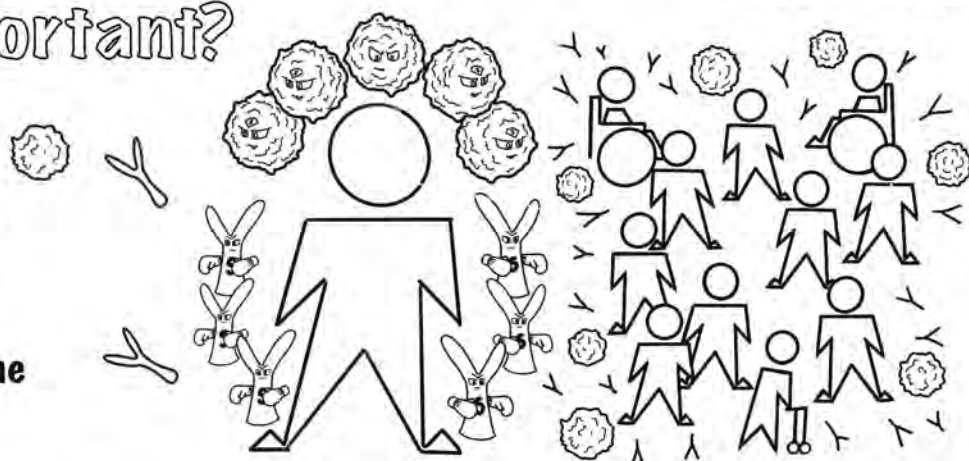


How do they work?

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Why are they important?

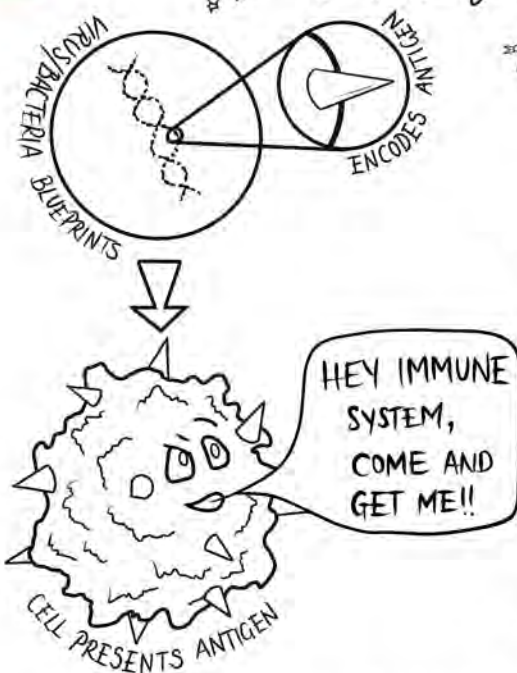
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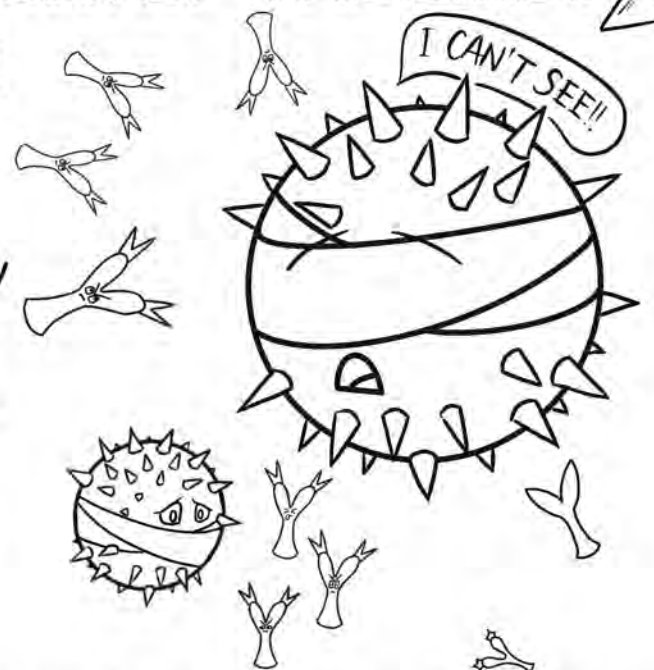
DNA/RNA VACCINES



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LIVE ATTENUATED VACCINES

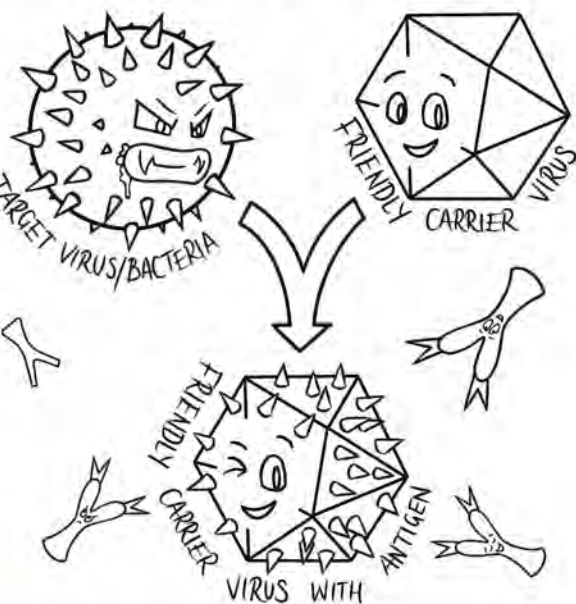
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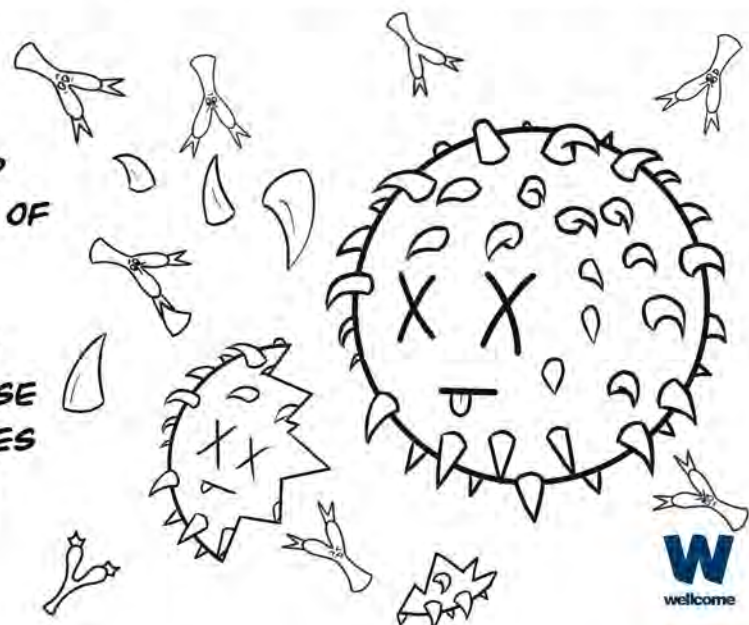
VACCINES

INACTIVATED GERMS AND PROTEIN VACCINES



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THIS HAS EITHER 'WHOLE' VIRUS/ BACTERIA WHICH HAVE BEEN KILLED OR SMALL PIECES OF THE GERM LIKE PROTEINS OR SUGARS! NEITHER ARE ABLE TO CAUSE DISEASE. EXAMPLES INCLUDE THE FLU, HEPATITIS A AND MENINGITIS B!



Brechlynnau: Cyflwyniad

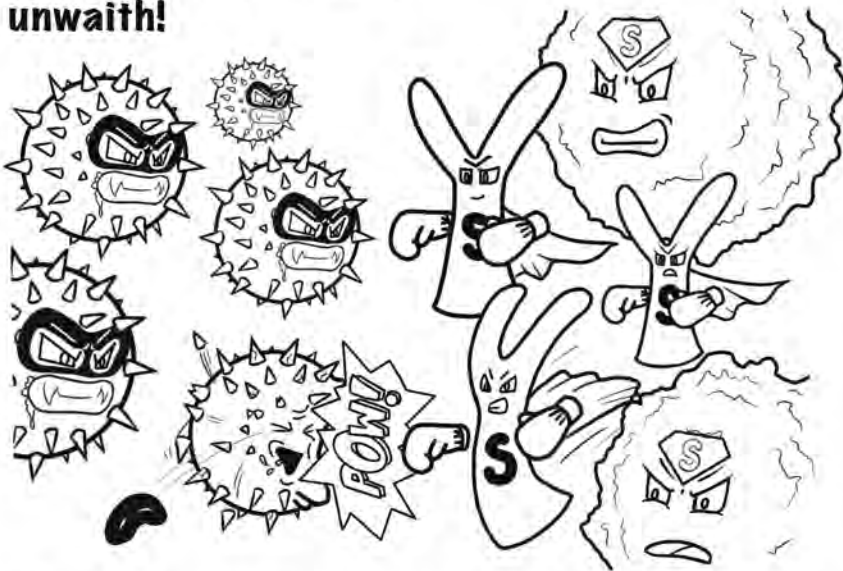
Beth yw brechlyn?

Mae brechlyn yn math o feddyginiaeth sy'n dysgu'ch system imiwnedd i adnabod rhai germau, ac a roddir i atal yr unigolyn rhag bod yn sâl! Fel hyn, os yw'ch corff yn gweld y germ go iawn, gall eich system imiwnedd ei ymladd ar unwaith!



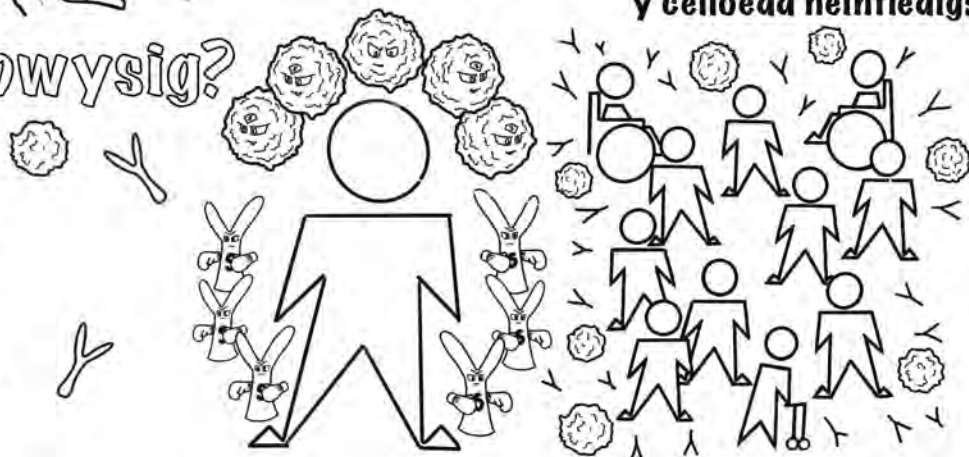
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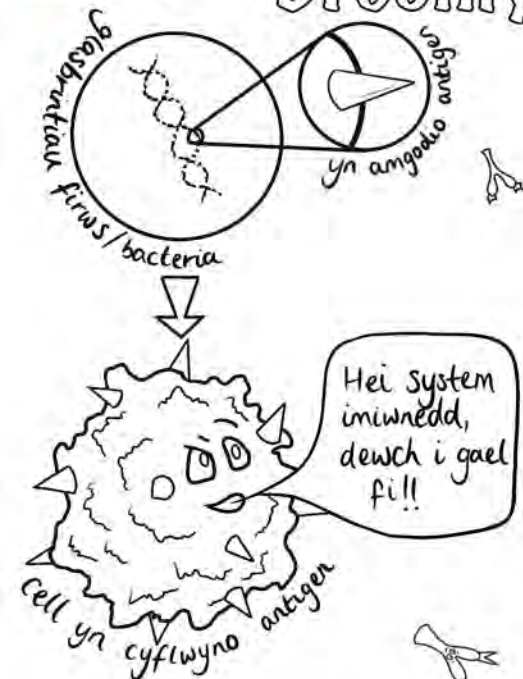


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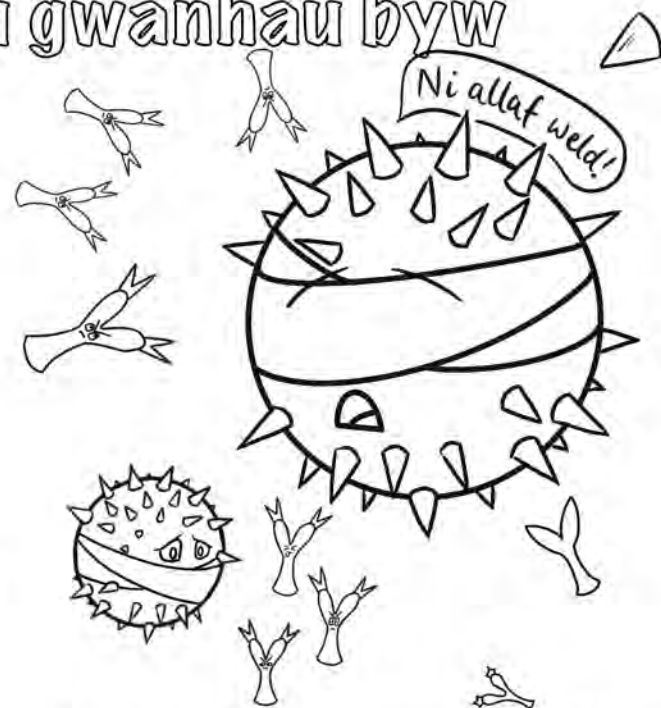
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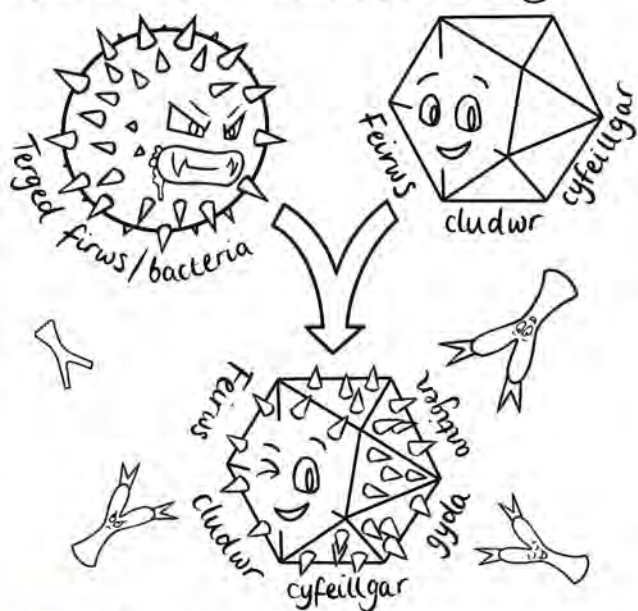


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Fector-seiliedig

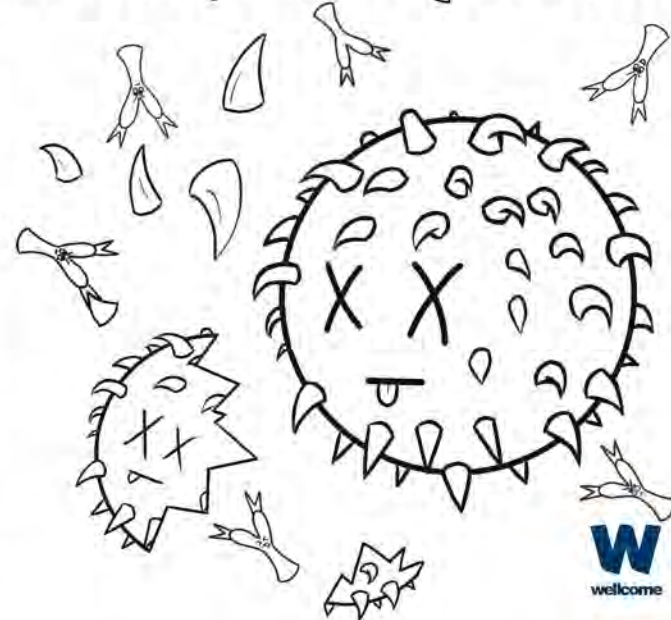


Brechlynnau

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Gemmau anactif a brechlynnau protein



Vaccines:

an introduction

What is a vaccine?

A vaccine is a type of medicine that teaches your immune system to recognise certain germs, and is given to stop you getting sick. This way if your body sees the real germ your immune system can fight it straight away!

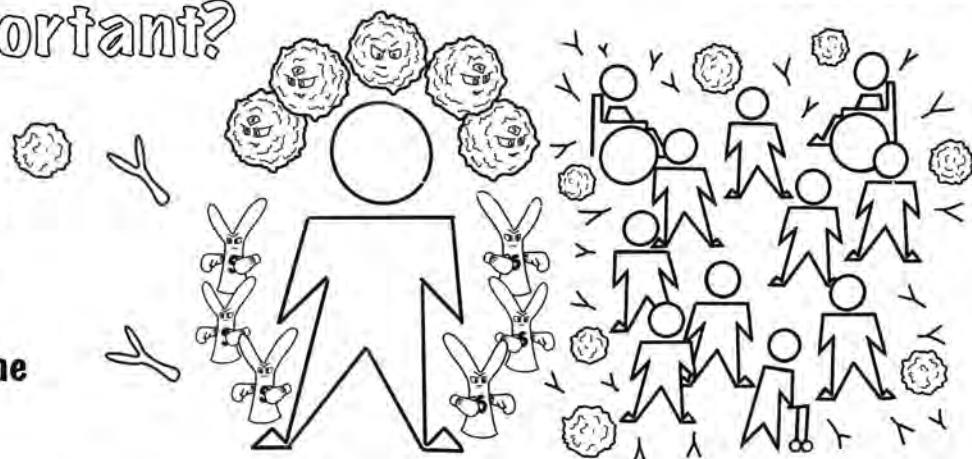


How do they work?

Vaccines contain dead or small pieces of the germ you want to be protected against. By giving you this harmless form of the germ, your immune system can prepare for the real thing! Some vaccines trigger production of antibodies, molecules that can stick to the germ and flag it to the body for destruction! Other vaccines signal for T cells, key players of the immune system that will quickly recognise the real germ and can kill infected cells!

Why are they important?

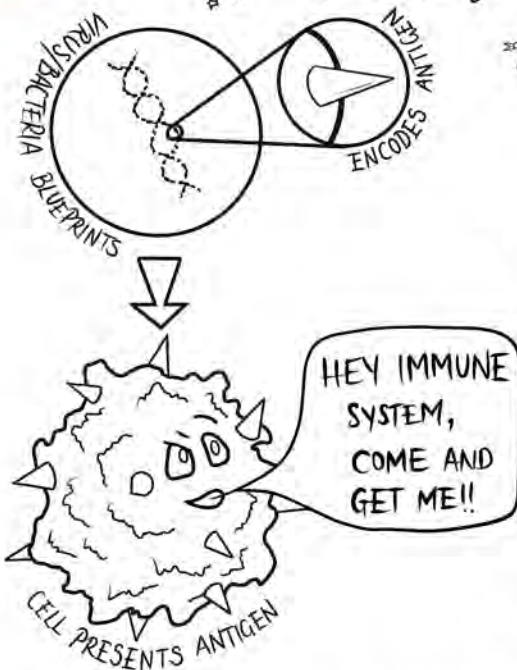
Vaccination stops you personally getting sick from nasty illnesses! Not only is this great for you, but it stops you passing it on to other people that are more vulnerable like the elderly and those that are unwell!



Do they protect me for life?

It depends on the vaccine and the disease you're protecting against. Some vaccines need to be given yearly (like the flu) because the virus changes, so that vaccine isn't effective anymore! Other vaccines are only needed once, like HPV vaccine!

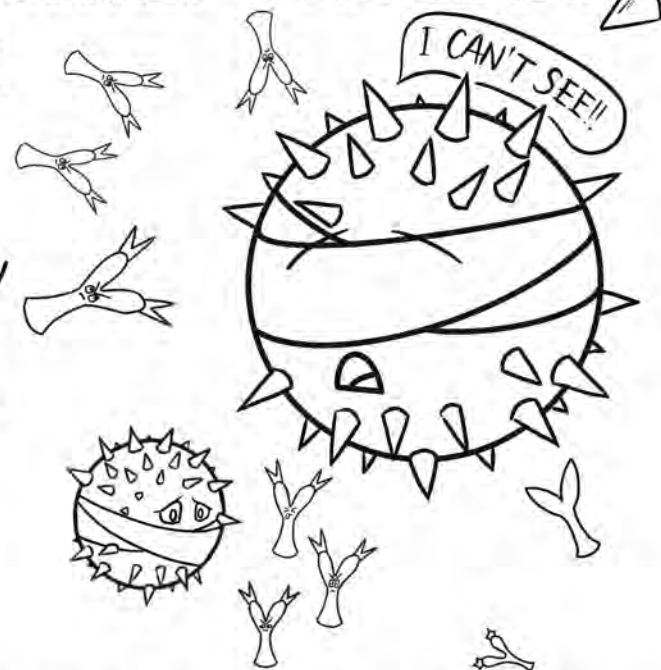
DNA/RNA VACCINES



THIS VACCINE WORKS BY INSERTING PARTS OF THE CODE OR BLUEPRINTS OF VIRUSES/ BACTERIA (CALLED DNA OR RNA) INTO OUR OWN CELLS! THIS TELLS OUR CELLS TO MAKE SMALL PIECES OF THE GERM CALLED ANTIGEN! OUR IMMUNE SYSTEM WILL SEE THIS ANTIGEN AND REMEMBER IT IN CASE WE GET INFECTED. DNA/RNA VACCINES CANNOT CAUSE DISEASE!

LIVE ATTENUATED VACCINES

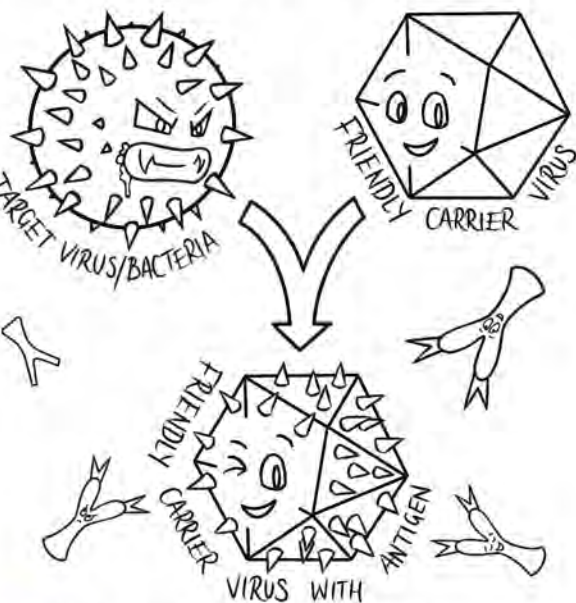
THIS VACCINE CONTAINS WHOLE VIRUS/BACTERIA THAT CAN STILL GET INTO OUR CELLS, BUT HAS BEEN WEAKENED SO MUCH THAT IT IS NOW HARMLESS! EXAMPLES OF THIS TYPE OF VACCINE ARE THE MMR AND CHICKENPOX VACCINES!



VECTOR-BASED

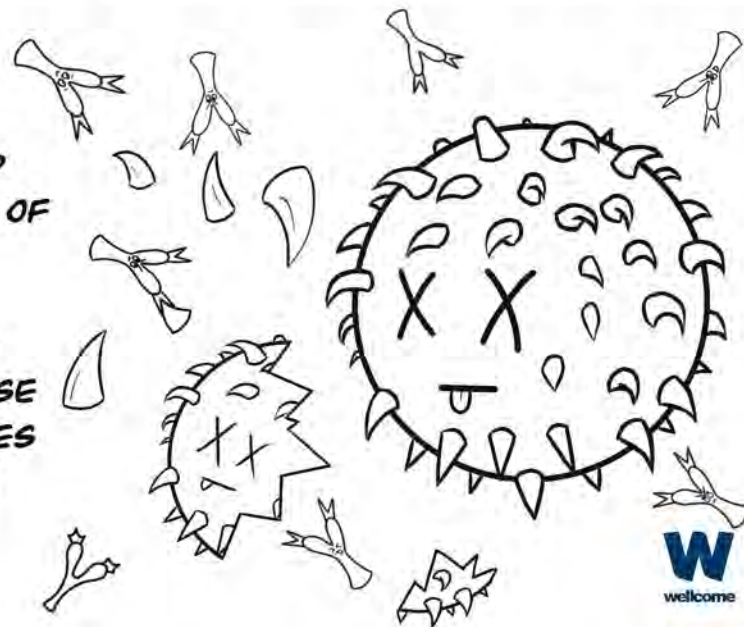
VACCINES

INACTIVATED GERMS AND PROTEIN VACCINES



THIS USES A VERY SAFE, WELL-UNDERSTOOD VIRUS AS A WAY TO CARRY AROUND A PIECE OF HARMFUL VIRUS/ BACTERIA CALLED ANTIGEN! THE IMMUNE SYSTEM WILL ONLY SEE THE ANTIGEN AS DANGEROUS!

THIS HAS EITHER 'WHOLE' VIRUS/ BACTERIA WHICH HAVE BEEN KILLED OR SMALL PIECES OF THE GERM LIKE PROTEINS OR SUGARS! NEITHER ARE ABLE TO CAUSE DISEASE. EXAMPLES INCLUDE THE FLU, HEPATITIS A AND MENINGITIS B!



Brechlynnau: Cyflwyniad

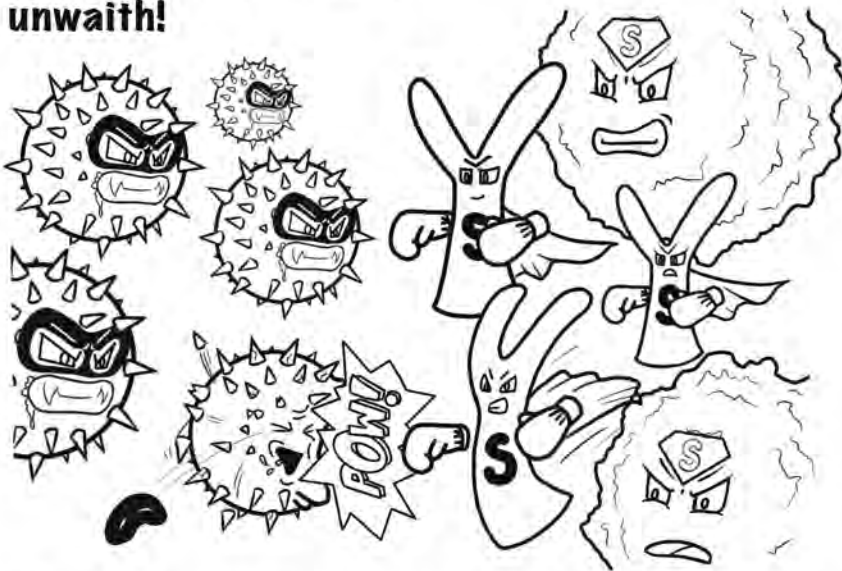
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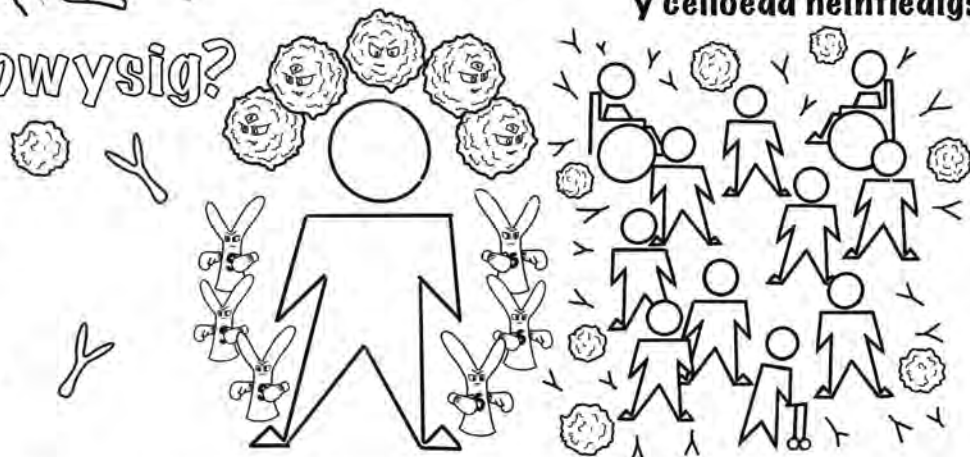
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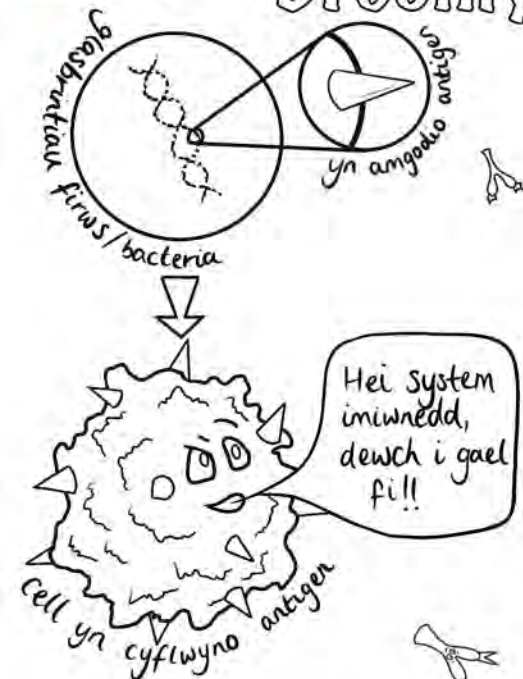


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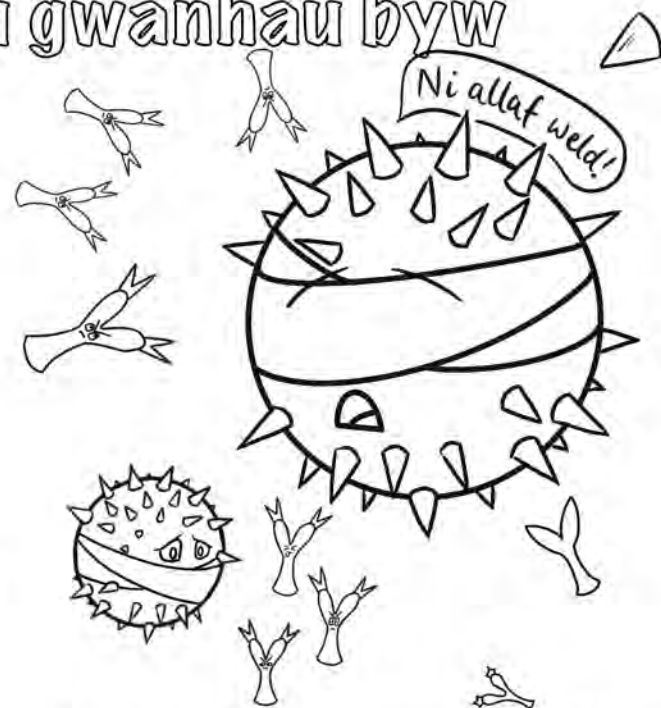
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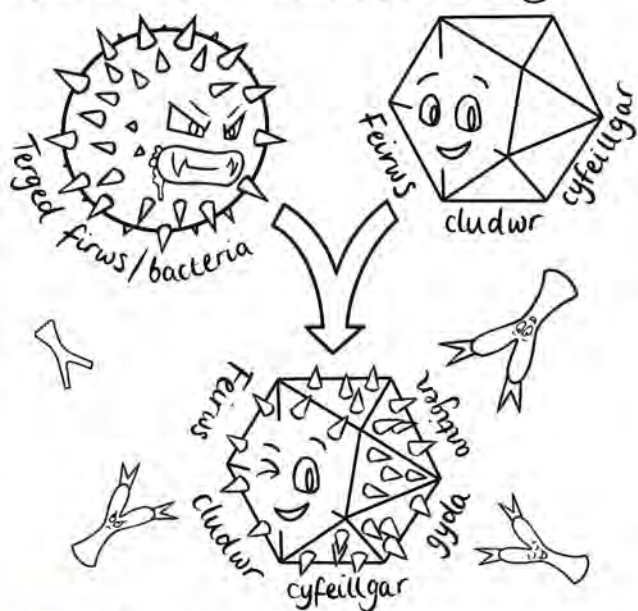


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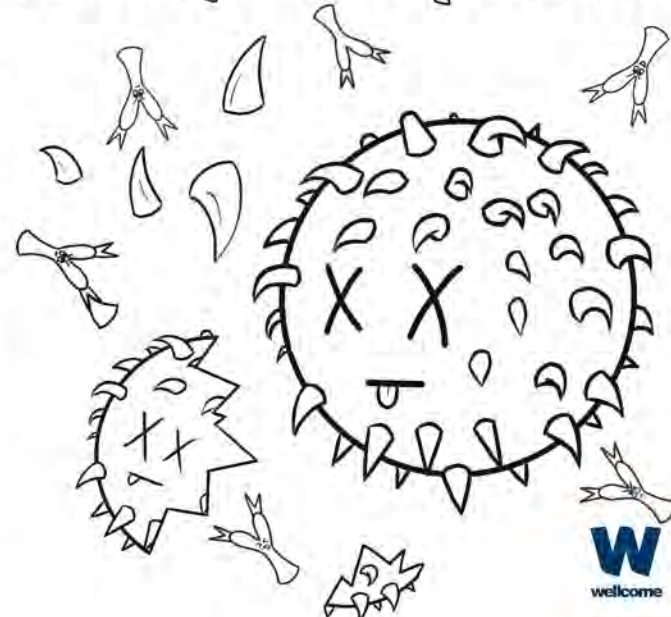


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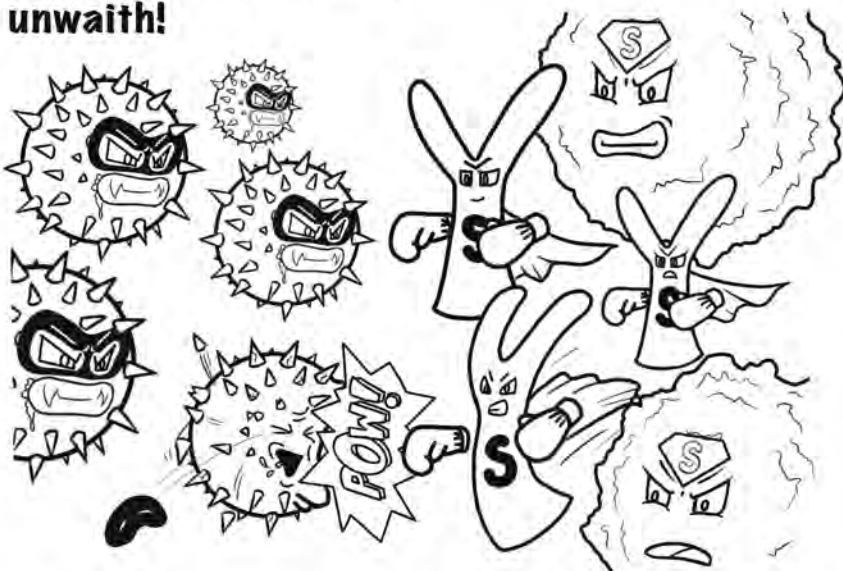
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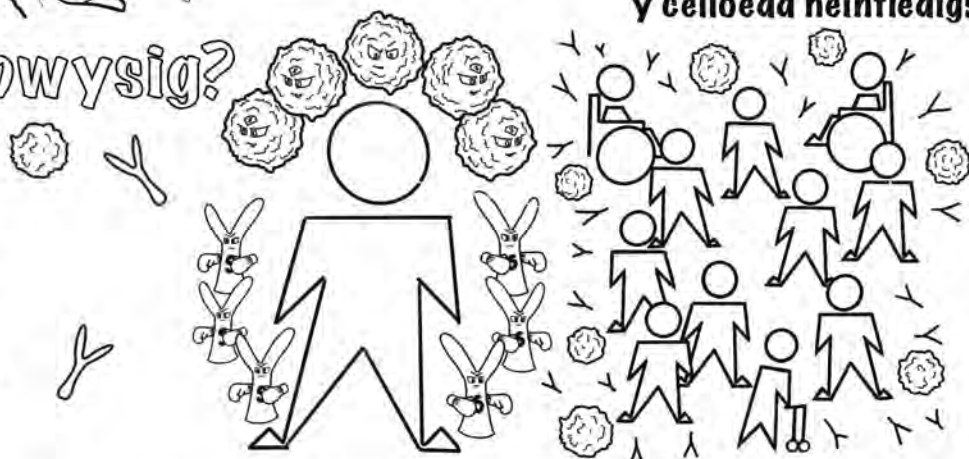
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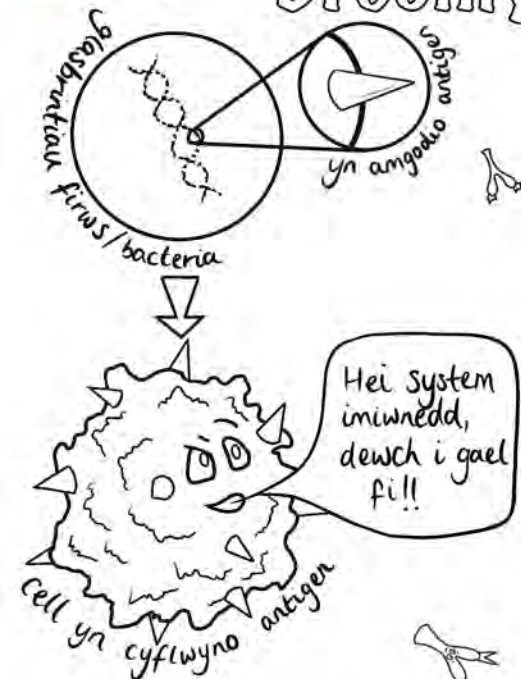


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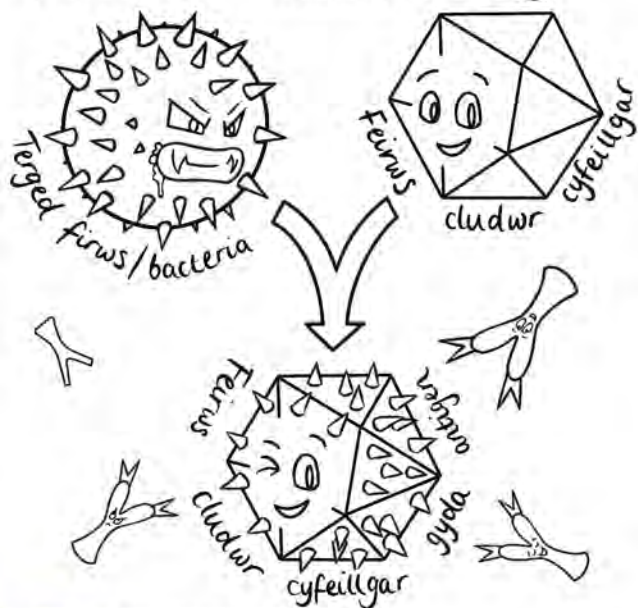
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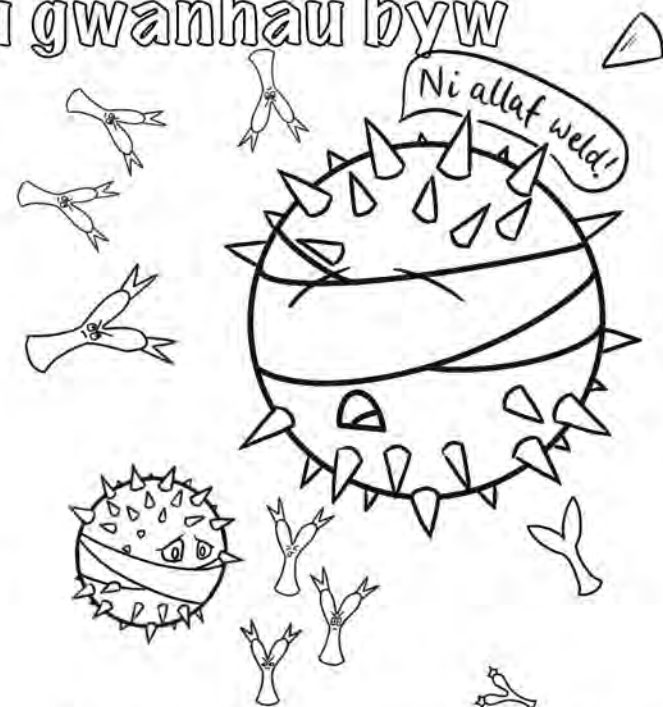


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