

BOOK 4

GENOME

ADVENTURES

HOPE ON THE HORIZON:

KITSO EXPLORES BIOMEDICAL & GENOMICS RESEARCH



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WAS EVERYTHING
JUST A DREAM?



KITSO, LOVE, YOUR
PORRIDGE IS GETTING
COLD!



BUT IT WAS
ALL SO REAL...



I HAD THIS GREAT
DREAM. THE SUPERHEROES
TAUGHT ME ALL ABOUT
HEREDITY, GENETICS, AND
DNA. OH, CAN I PLEASE
HAVE SOME SQUASH?

SUPERHEROES? SORRY
WE'RE OUT OF SQUASH.

THEY SHRUNK ME DOWN
AND I WENT INSIDE THE
HUMAN BODY. IT WAS
AWESOME!

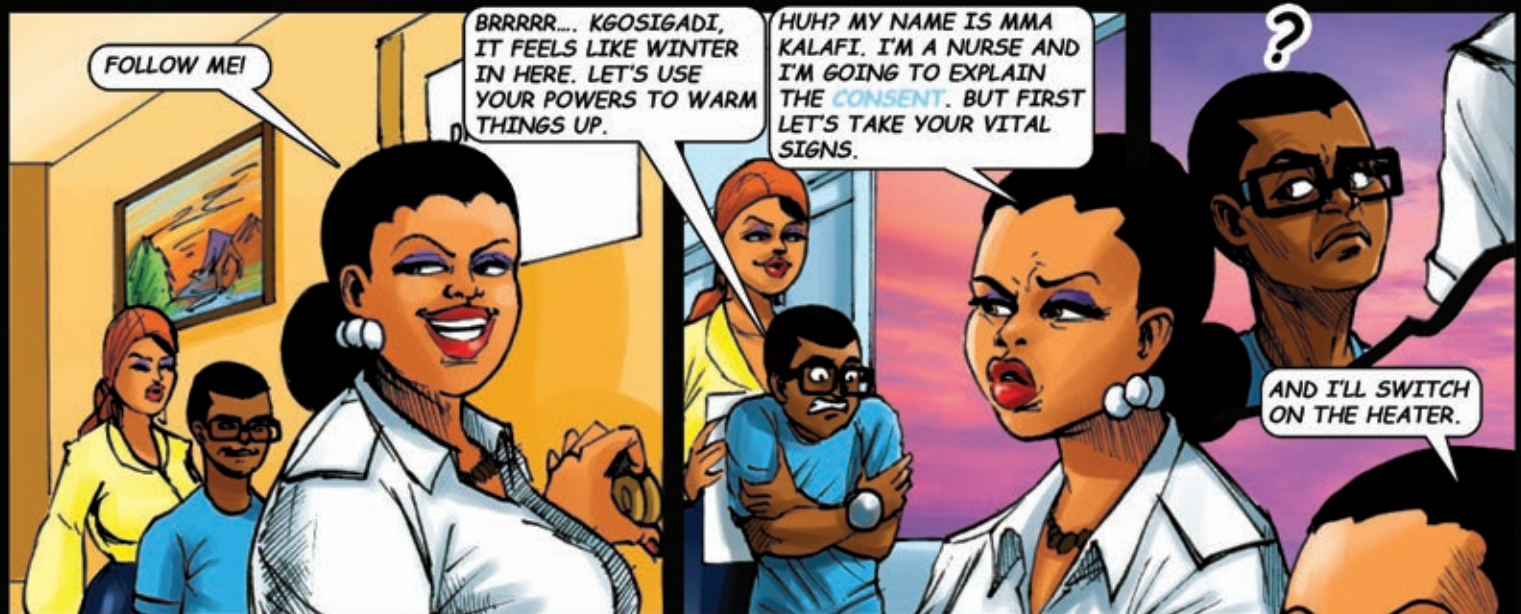
OH, DID YOU NOW?

YES! AND AUNTIE,
I HAVE SOMETHING
IMPORTANT TO TELL
YOU. I WANT TO
JOIN THE KALAHARI
STUDY. SCIENCE IS
COOL. I WANT TO
HELP ELIMINATE HIV
AND TB. LET'S GO TO
THE CLINIC.

OK! FINISH YOUR
PORRIDGE, THEN
WE CAN GO.







FOLLOW ME!

BRRRRR.... KGOSIGADI,
IT FEELS LIKE WINTER
IN HERE. LET'S USE
YOUR POWERS TO WARM
THINGS UP.

HUH? MY NAME IS MMA
KALAFI. I'M A NURSE AND
I'M GOING TO EXPLAIN
THE CONSENT. BUT FIRST
LET'S TAKE YOUR VITAL
SIGNS.

AND I'LL SWITCH
ON THE HEATER.



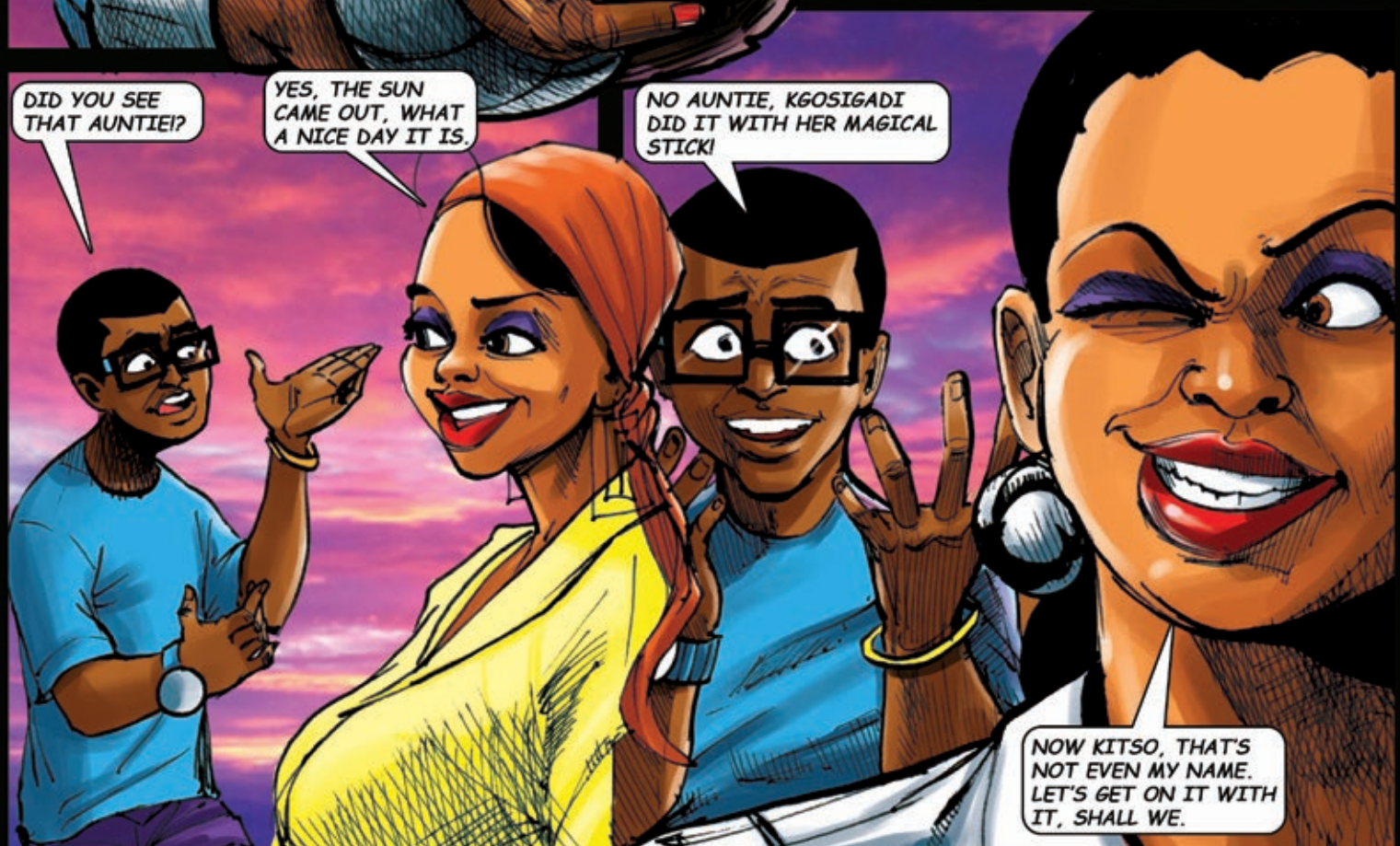
SWISHHHH!

!!

DID YOU SEE
THAT AUNTIE!

YES, THE SUN
CAME OUT, WHAT
A NICE DAY IT IS.

NO AUNTIE, KGOSIGADI
DID IT WITH HER MAGICAL
STICK!

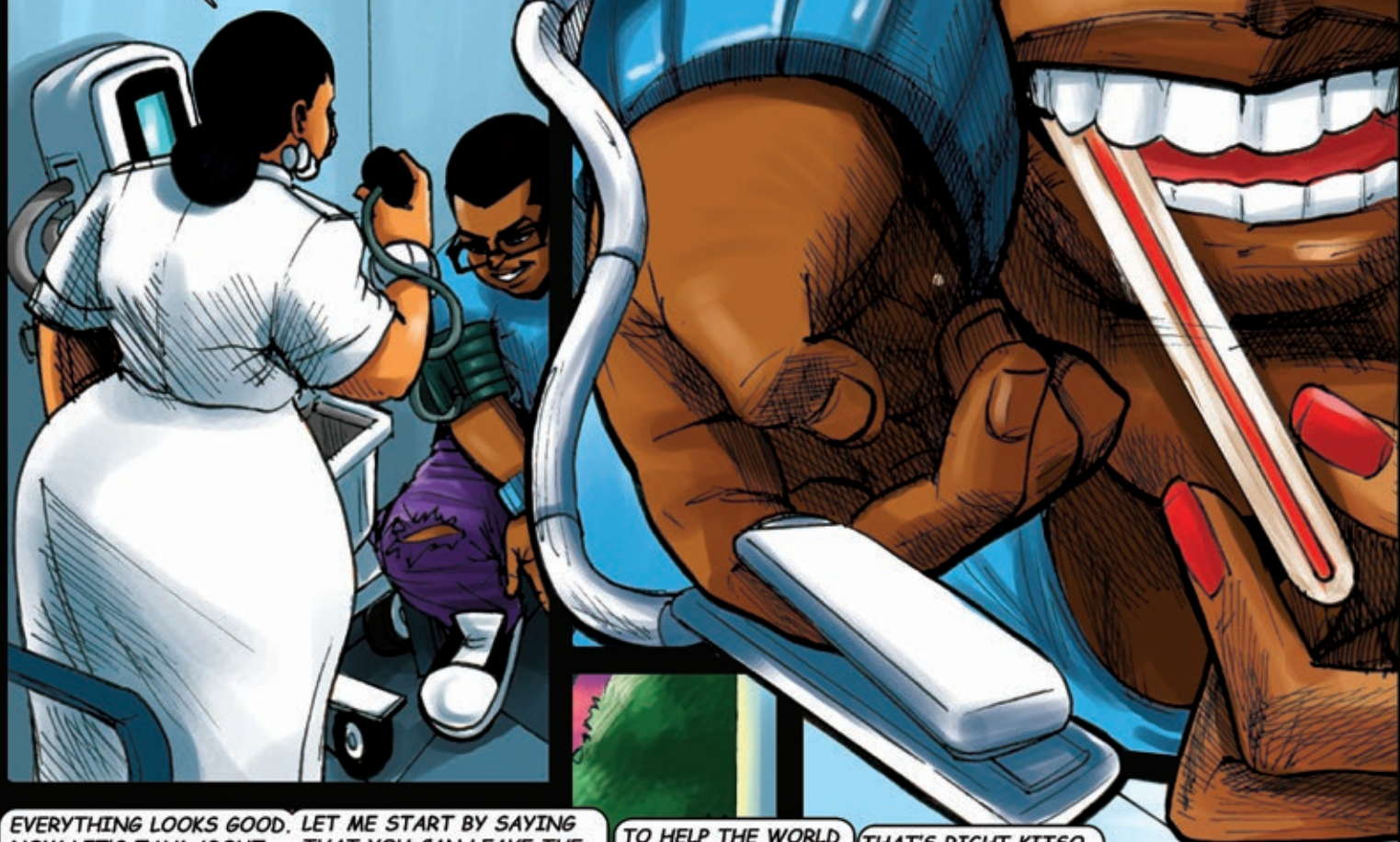


NOW KITSO, THAT'S
NOT EVEN MY NAME.
LET'S GET ON IT WITH
IT, SHALL WE.

I'M GOING TO TAKE
YOUR BLOOD PRESSURE...

CHECK YOUR HEART RATE...

TEMPERATURE,
WEIGH AND
MEASURE YOU.



EVERYTHING LOOKS GOOD.
NOW LET'S TALK ABOUT
THE STUDY.

LET ME START BY SAYING
THAT YOU CAN LEAVE THE
STUDY AT ANYTIME. KITSO,
DO YOU KNOW WHAT THIS
STUDY IS ALL ABOUT?

TO HELP THE WORLD
LEARN HOW HIV AND
TB BEHAVE. RIGHT?

THAT'S RIGHT KITSO.


THE STUDY LOOKS AT YOUR
DNA AND THE DNA FROM LOTS
OF OTHER CHILDREN. REMEMBER
HOW YOU DIDN'T HAVE TO START
TREATMENT UNTIL YOU WERE 10
YEARS OLD?



WELL, THAT'S WHAT'S CALLED
A **LONG-TERM PROGRESSOR**. SOME
CHILDREN WITH HIV NEED TREATMENT
WITHIN THE FIRST FEW MONTHS OF
LIFE.

WE CALL THOSE
PATIENT'S **RAPID
PROGRESSORS**.





WE WANT TO COMPARE YOUR DNA TO THEIRS AND SEE IF THERE ARE ANY DIFFERENCES THAT COULD HELP DEVELOP FUTURE TREATMENTS OR VACCINES.

OH! LIKE A GENOME-WIDE ASSOCIATION STUDY?!

WE TALKED ABOUT IT IN GHANZI DISTRICT, REMEMBER?

OH KITSO, YOU'VE NEVER EVEN BEEN TO GHANZI DISTRICT.

WOW! THAT'S RIGHT, KITSO! HOW DID YOU KNOW THAT?

ANYWAYS, LET'S TALK ABOUT WHAT ENROLLING IN THE STUDY MEANS FOR YOU. EVERY 6 MONTHS YOU COME FOR A CHECKUP AND A BLOOD DRAW.

IF YOU JOIN THE STUDY, WE'LL GET JUST A LITTLE MORE BLOOD ON THOSE DAYS.

OH, NO EXTRA PUNCTURES?

AND NO EXTRA CLINIC VISITS?

NO, THERE WILL NOT BE ANY MORE BLOOD DRAWS THAN YOU GET NOW, AND ALL YOUR VISITS WILL BE ON THE SAME DAY AS CLINIC.

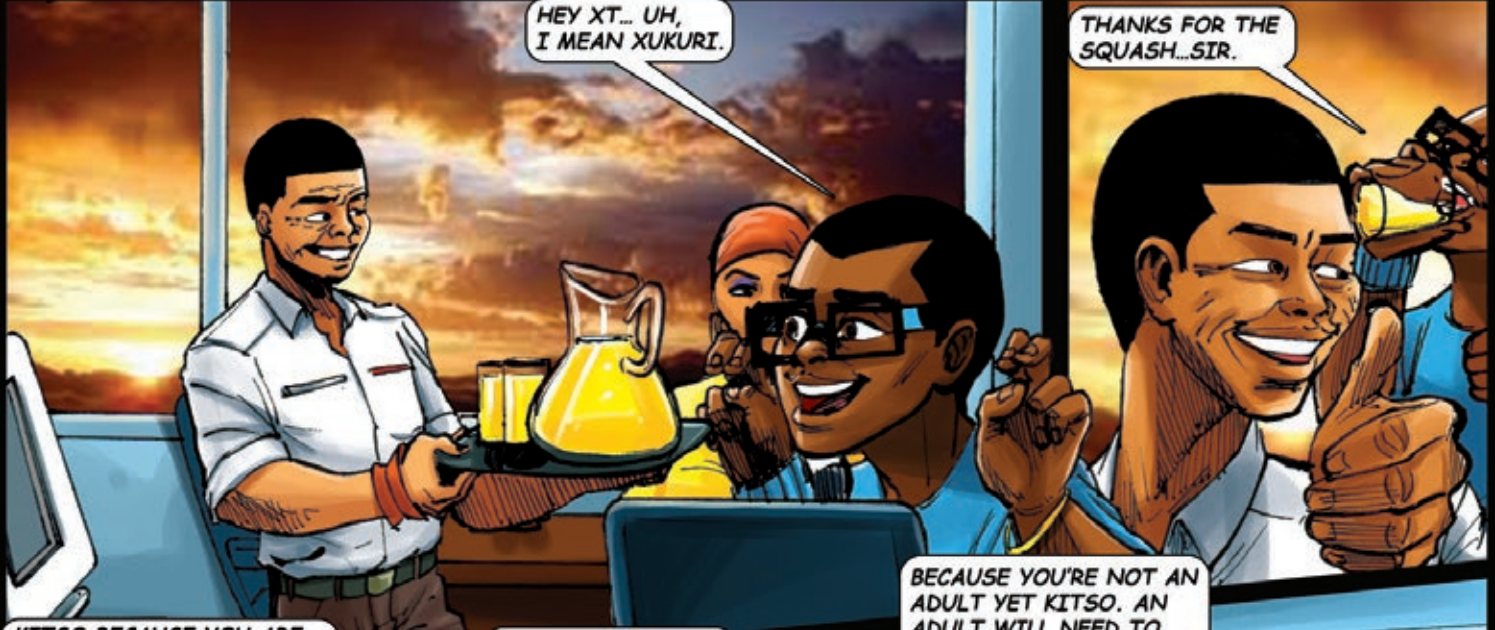
THAT'S GREAT!

NOW LET'S TALK ABOUT **CONSENT**. CONSENT MEANS THAT YOU ARE GIVING PERMISSION FOR SOMETHING. IN THIS CASE YOU ARE GIVING US PERMISSION TO USE YOUR BLOOD FOR STUDIES.

IT'S VERY IMPORTANT TO UNDERSTAND THE FOLLOWING THINGS BEFORE YOU GIVE PERMISSION: WHY WE'RE DOING THE STUDY, WHAT WILL HAPPEN DURING THE STUDY, AND WHO WILL SEE YOUR RESULTS. NOW LET'S REVIEW THOSE THINGS...

KITSO THIS PART IS VERY IMPORTANT. ARE YOU STILL WITH ME?

YES BUT I'M A LITTLE ...



HEY XT... UH,
I MEAN XUKURI.


THANKS FOR THE
SQUASH...SIR.

KITSO BECAUSE YOU ARE
LESS THAN 21 YEARS OLD,
YOUR AUNTIE WILL ALSO
NEED TO SIGN A CONSENT
FORM.


WHY? AUNTIE ISN'T
PARTICIPATING IN
THE STUDY.

BECAUSE YOU'RE NOT AN
ADULT YET KITSO. AN
ADULT WILL NEED TO
GIVE US PERMISSION.
YOU WILL ALSO GIVE
US PERMISSION KITSO,
BY SINGING AN ASSENT
FORM, WHICH IS A
CONSENT FOR KIDS.

BUT WHAT IF MY
AUNTIE SAYS "NO"
AND I SAY "YES?"



GOOD QUESTION. WE NEED
BOTH YOU AND YOUR
AUNTIE TO GIVE PERMISSION
FOR YOU TO BE IN THE STUDY.
WHAT DO YOU THINK KITSO?



WELL, WHAT ABOUT MY BLOOD?
I KNOW AT THE CLINIC THEY
MEASURE CD4 AND THE VIRUS. BUT
NOW YOU'RE GOING TO DO
EXPERIMENTS ON IT! WILL
SCIENTISTS MAKE CLONES OF ME?

NO KITSO, HAHAAH! LET ME EXPLAIN. FOR THIS STUDY WE USE **BROAD CONSENT**. THAT MEANS SCIENTISTS CAN USE YOUR BLOOD SAMPLE, WHICH WE'RE GOING TO STORE IN A SPECIAL SAFE BUILDING CALLED A BIOBANK, FOR FUTURE STUDIES THAT HAVE TO DO WITH HEALTH.

MAYBE IN THE FUTURE SCIENTISTS WILL BE ABLE TO MAKE A VACCINE FOR HIV AND TB. IT HASN'T BEEN POSSIBLE YET, BUT YOUR BLOOD WILL BE THERE FOR WHEN THEY CAN DO IT. SO, NO, NO ONE IS GOING TO CLONE YOU.

PHEW! ANY CHANCE THE SCIENTISTS CAN GIVE ME SOME SUPERPOWERS LIKE YOURS?



NO KITSO, WE'RE ONLY INTERESTED IN MAKING PEOPLE HEALTHY. AND WE ALL KNOW THAT SUPERPOWERS AREN'T REAL.

WHAT DO YOU SAY AUNTIE? I'M GOING TO SIGN, "YES" ON MY **ASSENT** FORM.

I'LL ONLY SIGN MY CONSENT FORM IF THE STUDY IS SAFE AND IMPORTANT.



I DO THINK THE STUDY IS IMPORTANT. AND I UNDERSTAND THE PROCEDURES, THE PRIVACY, AND WHO WILL SEE THE RESULTS. BECAUSE OF THIS, I'LL SIGN "YES".

THE STUDY IS VERY SAFE MMA. WE WON'T DO ANYTHING EXTRA THAN WHAT WE WOULD NORMALLY DO DURING HIS CHECK-UPS, AND WE TAKE MANY STEPS TO ENSURE KITSO'S PRIVACY IS RESPECTED. BUT I CANNOT DECIDE FOR YOU IF THE STUDY IS IMPORTANT. YOU MUST DECIDE THAT FOR YOURSELF.



EXCELLENT! NOW LET ME GO GET THE PERSON WHO DRAWS YOUR BLOOD.



HELLO, MY NAME IS DR. MOSENODI, IT'S TIME FOR YOUR PHYSICAL EXAM, KITSO.

NO, YOU'RE DR. MABOKO. I JUST SAW YOU WALK THROUGH A WALL!!

AGHI WENA, MANI! SUCH AN IMAGINATION.

ZWINGI

I'M GOING TO USE A STETHOSCOPE TO LISTEN TO YOUR HEARTBEAT AND LUNGS. HAVE YOU HAD A COUGH RECENTLY? ANY PAIN?

NO, REMEMBER! I DODGED THE SICKLE CELL WHEN I WAS SHRUNK INSIDE THE BLOOD VESSEL.

THERE'S NOT A SCRATCH ON ME!

WHAT'S THAT MY BOY? ANYWAYS, EVERYTHING APPEARS NORMAL. YOU'RE AS STRONG AS AN OX.

HELLO KITSO! I'M MMONI, YOUR PHLEBOTOMIST. THAT'S A FANCY NAME FOR SOMEONE WHO DRAWS BLOOD.

DID YOU KNOW WE ONLY NEED 3 TEASPOONS FOR THE STUDY? THE REST IS FOR YOUR NORMAL CHECK-UP LABS.

OH, I THOUGHT THAT'S WHAT VAMPIRES DO?

OUCH! CAN'T YOU SHRINK THE NEEDLE WITH YOUR POWERS?

OH KITSO, I HAVEN'T EVEN STARTED YET...

OH...

ALL DONE!

WOW! THAT WAS EASY.

LET'S PUT THESE TUBES IN THE COOLER AND SEND THEM TO THE LAB AT THE UNIVERSITY OF MMADIKOLOI KITSO, WHY DON'T YOU COME ALONG AND SEE ALL THE COOL TECHNOLOGY?

CAN WE, AUNTIE?!

OF COURSE!

KITSO, THIS IS OUR LAB TECHNICIAN, TSHEPO, HE'LL SHOW YOU AROUND AND TELL YOU ABOUT WHAT HE DOES WITH YOUR BLOOD. I HAVE TO GET BACK TO THE CLINIC.

WELCOME TO UM, KITSO!

MARANYANE! WHERE IS YOUR SUPERHERO OUTFIT?

HERE WE GO AGAIN...

I LIKE TO WEAR A WHITE COAT IN THE LAB.

SO, HERE WE GO. FIRST, WE SCAN YOUR TUBE TO KEEP TRACK OF THE SAMPLE. THEN, WE WARM UP YOUR SAMPLE IN A WATER BATH.

NOW THAT YOUR BLOOD IS NICE AND HOT WE'RE GOING TO SPIN IT IN OUR **CENTRIFUGE** TO SEPARATE THE DIFFERENT PARTS OF YOUR BLOOD.

THESE ARE THE RED BLOOD CELLS AT THE BOTTOM, THE FLUID IS IN THE MIDDLE...

AND THE WHITE BLOOD CELLS ARE AT THE TOP, RIGHT?

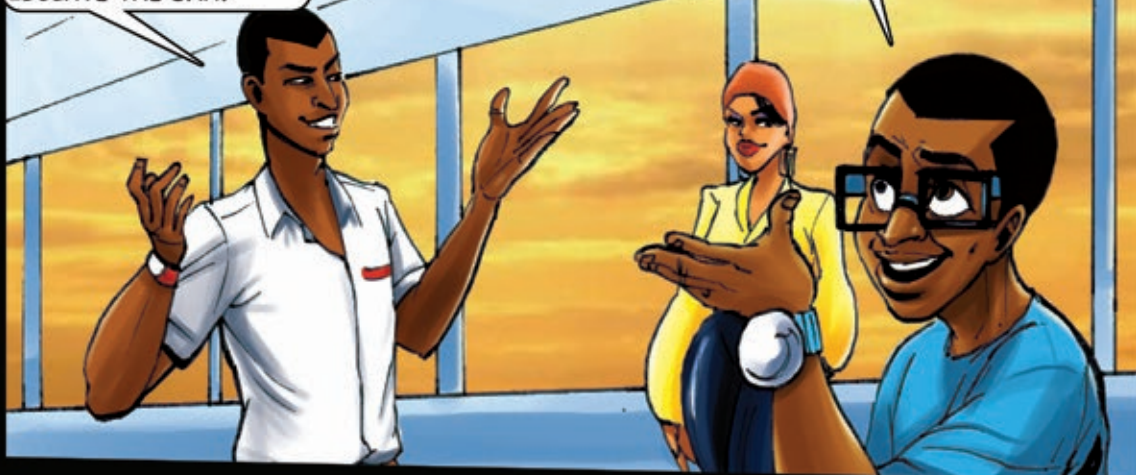


THAT'S RIGHT KITSO. AND THAT'S WHERE WE GET THE DNA. WE'RE GOING TO ADD A FEW EXTRA INGREDIENTS CALLED **'REAGENTS'** TO BREAK UP THE CELLS AND ISOLATE THE DNA.

BEFORE SEQUENCING, WE ADD THE DNA TO THE **FLUOROMETER** TO MAKE SURE IT'S THE RIGHT CONCENTRATION.

YOU DO THAT ALL BY YOURSELF, FOR EVERY PATIENT?

IT'S QUITE SUPERHUMAN, ISN'T IT?



NOW COMES THE EXCITING PART, KITSO: **DNA SEQUENCING!**

WE HAND THE DNA TO THIS MACHINE, WHICH CAN GIVE US A PRINT-OUT OF THE COMPLETE DNA CODE.

YOU MEAN IT CAN READ THROUGH ALL THE BOOKS OF THE DNA LIBRARY?

YES, KITSO! IT USED TO TAKE MONTHS TO READ THE DNA SEQUENCE, BUT WITH THE NEWER MACHINES WE CAN DO IT IN A MATTER OF HOURS.

WOW!





ONCE THE **SEQUENCING** FOR ALL PATIENTS IS COMPLETED, WE CAN COMPARE ALL THEIR GENES AND LOOK FOR NEW TARGETS OF MEDICINES AND VACCINES!

AND THAT'S IT!

THAT'S QUITE FASCINATING, BUT I THINK IT IS TIME FOR US TO HEAD BACK TO THE CLINIC.

THANKS, MARANYANE!

I CAN'T BELIEVE SO MUCH WORK GOES INTO THESE EXPERIMENTS.

IT'S PRETTY IMPRESSIVE. I JUST WISH THERE WAS SOME WAY I COULD HELP TOO!



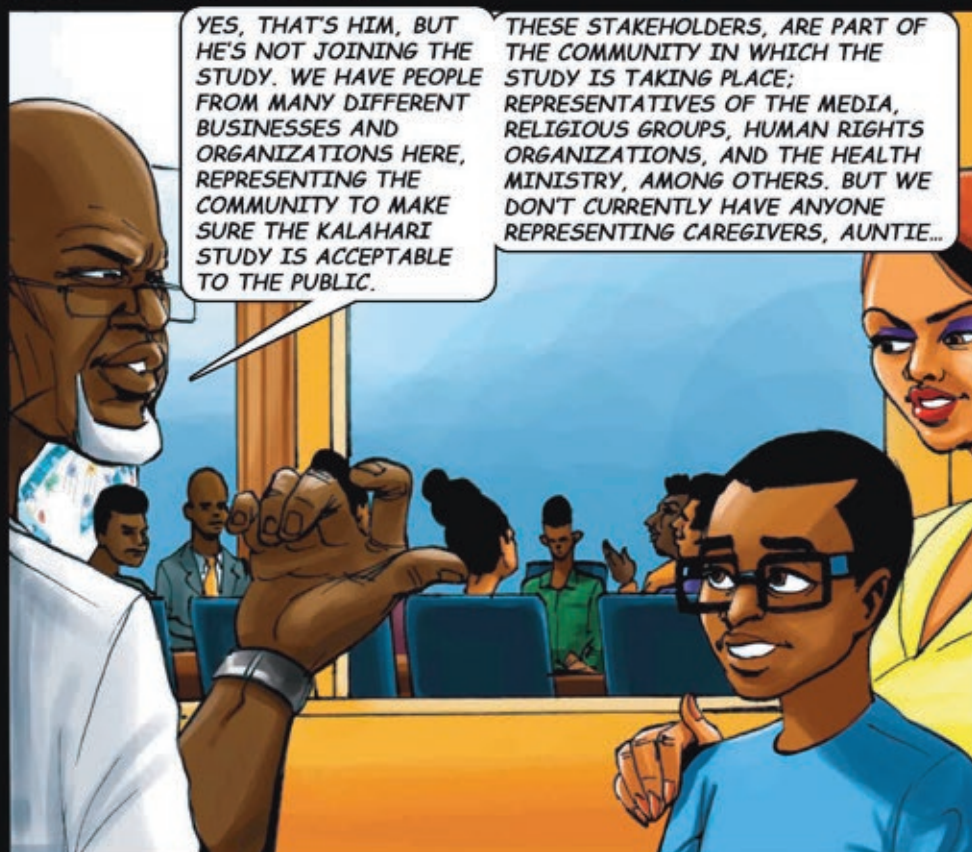
I MAY HAVE SOMETHING IN MIND, COME WITH ME.



THIS IS OUR COMMUNITY ADVISORY BOARD MEETING IN THE CLINIC BOARDROOM.



IS THAT MR BATHOENG? HE'S MY SCHOOL'S PRINCIPAL! IS HE JOINING THE STUDY TOO?



YES, THAT'S HIM, BUT HE'S NOT JOINING THE STUDY. WE HAVE PEOPLE FROM MANY DIFFERENT BUSINESSES AND ORGANIZATIONS HERE, REPRESENTING THE COMMUNITY TO MAKE SURE THE KALAHARI STUDY IS ACCEPTABLE TO THE PUBLIC.

THESE STAKEHOLDERS, ARE PART OF THE COMMUNITY IN WHICH THE STUDY IS TAKING PLACE; REPRESENTATIVES OF THE MEDIA, RELIGIOUS GROUPS, HUMAN RIGHTS ORGANIZATIONS, AND THE HEALTH MINISTRY, AMONG OTHERS. BUT WE DON'T CURRENTLY HAVE ANYONE REPRESENTING CAREGIVERS, AUNTIE...

YOU MEAN I COULD BE ON THE COMMUNITY BOARD?

IF YOU WOULD LIKE TO, WE WOULD BE HAPPY TO HAVE YOU.

OF COURSE!

WHAT ABOUT KIDS LIKE ME? DO WE HAVE A BOARD TOO?

THAT'S THE LOCAL TEEN CLUB; A GROUP THAT MEETS ONCE A MONTH TO LEARN ABOUT SCIENCE, LIFE SKILLS, AND TO HAVE A COMMUNITY OF PEOPLE WHO TAKE PART IN OUR CLINIC.

WHEN CAN I JOIN?

LET'S SEE... HOW ABOUT NOW?

WHY DON'T YOU LOOK OUTSIDE THE WINDOW, KITSO.

WHO ARE ALL OF THOSE KIDS?



CAN I, AUNTIE?

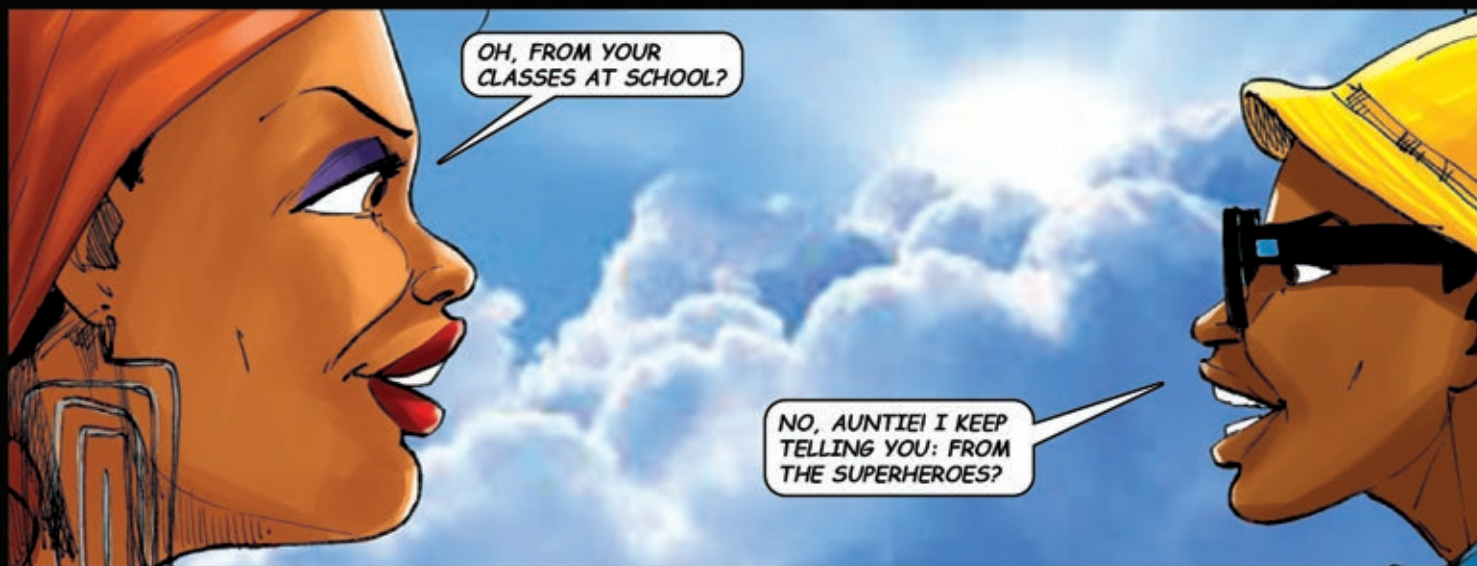
OF COURSE, DEAR.





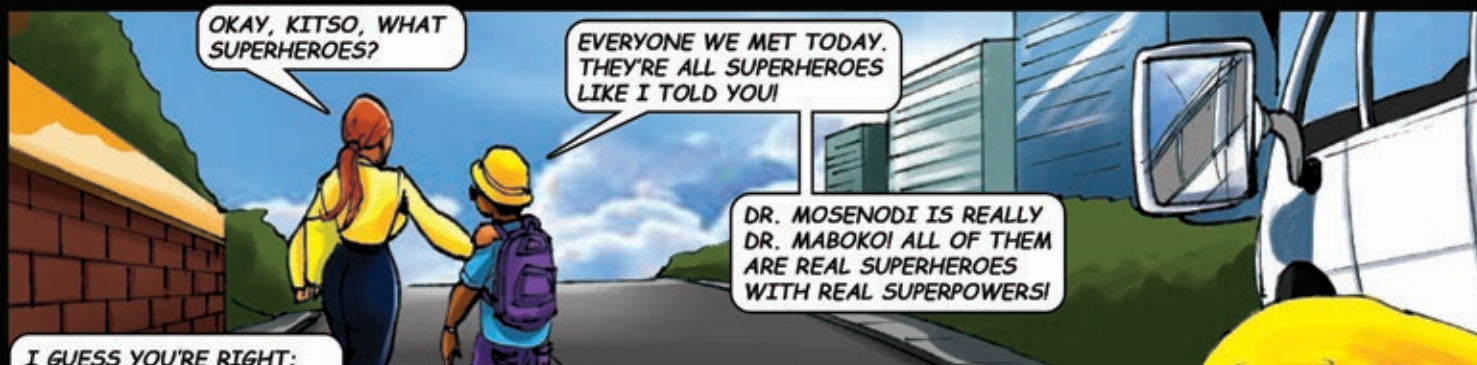
DID YOU HAVE FUN AT TEEN CLUB?

YEAH! WE LEARNED ABOUT INTERVIEWING FOR JOBS, I MET A BUNCH OF COOL KIDS FROM GABORONE, AND THEY TAUGHT US ABOUT DNA. BUT I ALREADY KNEW ABOUT ALL THAT...



OH, FROM YOUR CLASSES AT SCHOOL?

NO, AUNTIE! I KEEP TELLING YOU: FROM THE SUPERHEROES?



OKAY, KITSO, WHAT SUPERHEROES?

EVERYONE WE MET TODAY. THEY'RE ALL SUPERHEROES LIKE I TOLD YOU!

DR. MOSENODI IS REALLY DR. MABOKOI! ALL OF THEM ARE REAL SUPERHEROES WITH REAL SUPERPOWERS!



I GUESS YOU'RE RIGHT; THEY ARE ALL OUR SUPERHEROES IN THEIR OWN WAY. THE THINGS THEY DO FOR US - CURING DISEASES, KEEPING US HEALTHY.

JUST LIKE YOU, KITSO, BY JOINING THIS STUDY.

GLOSSARY

SCIENTIFIC TERMS

AUTOSOMAL RECESSIVE - THE INHERITANCE OF A TRAIT OR A DISORDER IN WHICH TWO COPIES OF THE ABNORMAL GENE MUST BE PRESENT FOR THE TRAIT OR DISORDER TO DEVELOP.

CD4 CELLS – A TYPE OF WHITE BLOOD CELL THAT IS INVOLVED IN FIGHTING INFECTION. THESE ARE THE CELLS THAT ARE INVADDED BY THE HUMAN IMMUNODEFICIENCY VIRUS AND ARE THE CELLS IN WHICH THE VIRUS REPLICATES.

CCR5 – A PROTEIN ON THE SURFACE OF WHITE BLOOD CELLS THAT ACTS AS A RECEPTOR FOR HIV. HIV OFTEN USES CCR5 TO ENTER ITS TARGET CELLS. SOME INDIVIDUALS CARRY A MUTATION IN THE CCR5 GENE AND ARE RESISTANT TO HIV.

MALARIA – AN INFECTIOUS DISEASE CAUSED BY A PARASITE CARRIED BY MOSQUITOS. INDIVIDUALS WITH ONE COPY OF THE SICKLE CELL ALLELE MAY BE RESISTANT TO MALARIA.

NATURAL SELECTION – THE PROCESS WHEREBY ORGANISMS THAT ARE BETTER ADAPTED TO CHANGES IN THEIR ENVIRONMENT TEND TO SURVIVE LONGER AND PRODUCE MORE OFFSPRING. THIS THEORY WAS INTRODUCED BY CHARLES DARWIN.

RECEPTORS – PROTEIN MOLECULES ON THE SURFACE OF CELLS TO WHICH COMPLEMENTARY MOLECULES SUCH AS HORMONES OR ANTIBODIES RECOGNIZE AND BIND.

SICKLE CELL – AN ABNORMAL, CRESCENT SHAPED RED BLOOD CELL CONTAINING DEFECTIVE HAEMOGLOBIN. THESE SICKLE CELLS ARE CAUSED BY A HEREDITY DISEASE CALLED SICKLE CELL ANAEMIA. SICKLE CELLS STRUGGLE DELIVERING OXYGEN TO THE TISSUES OF THE BODY.

THE BLACK DEATH – ALSO KNOWN AS THE BUBONIC PLAGUE; ONE OF THE MOST DISASTROUS PANDEMICS IN HISTORY CAUSED BY THE YERSINIA PESTIS BACTERIUM.

ASSENT – AN AGREEMENT BY AN INDIVIDUAL NOT COMPETENT TO GIVE LEGALLY VALID, INFORMED CONSENT.

BROAD CONSENT – WHEN PARTICIPANTS IN A MEDICAL STUDY GIVE CONSENT TO USE THEIR BLOOD FOR FUTURE STUDIES.

CENTRIFUGE – A PIECE OF LABORATORY EQUIPMENT, TYPICALLY USED TO SEPARATE FLUIDS OF DIFFERENT DENSITIES, BY SPINNING THE LIQUID SAMPLES AT HIGH SPEED.

CONSENT – AN AGREEMENT BY AN INDIVIDUAL THAT IS COMPETENT TO GIVE LEGALLY VALID, INFORMED CONSENT.

DNA SEQUENCING – THE PROCESS OF DETERMINING THE SEQUENCE OF NUCLEOTIDES WITHIN A DNA STRAND.

FLUOROMETER – AN INSTRUMENT USED TO MEASURE THE INTENSITY OF FLUORESCENCE TO DETERMINE THE CONCENTRATION OF A SUBSTANCE.

LONG-TERM PROGRESSOR – HIV-INFECTED INDIVIDUALS THAT TAKE A LONGER PERIOD OF TIME TO PROGRESS TO AIDS AFTER PRIMARY HIV-INFECTION.

PHLEBOTOMIST – PEOPLE WHO ARE TRAINED TO COLLECT BLOOD FROM PATIENTS FOR DONATIONS, TRANSFUSIONS OR MEDICAL TESTING.

RAPID PROGRESSOR – HIV-INFECTED INDIVIDUALS THAT QUICKLY PROGRESS TO AIDS AFTER THE PRIMARY HIV-INFECTION

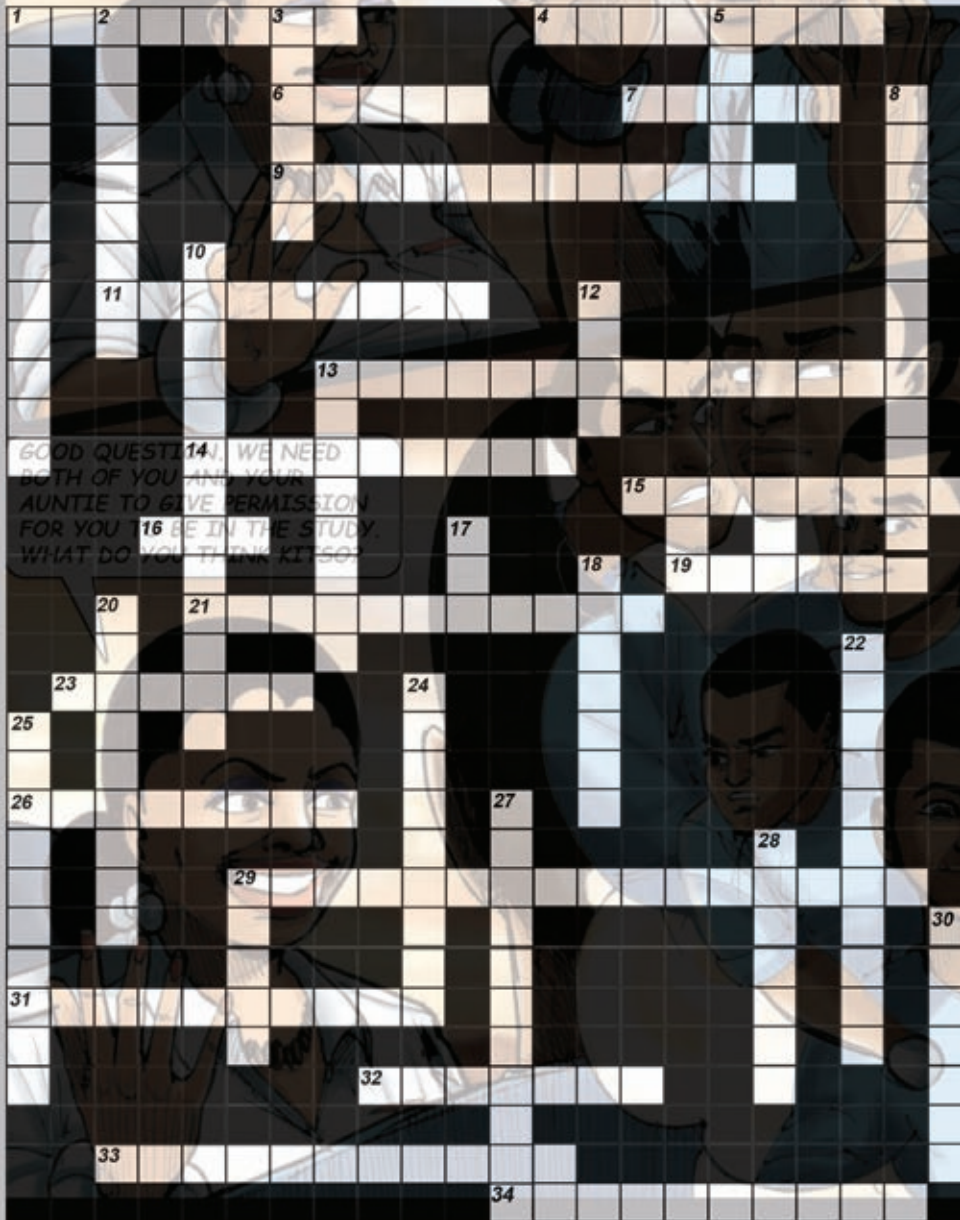
REAGENTS – EXTRA INGREDIENTS ADDED TO BLOOD TO BREAK UP CELLS AND ISOLATE DNA.

STETHOSCOPE – A MEDICAL INSTRUMENT USED TO LISTEN TO SOUNDS MADE WITHIN THE BODY SUCH AS A HEART BEAT.

SETSWANA TERMS

WENAI - YOU

CROSSWORD PUZZLE



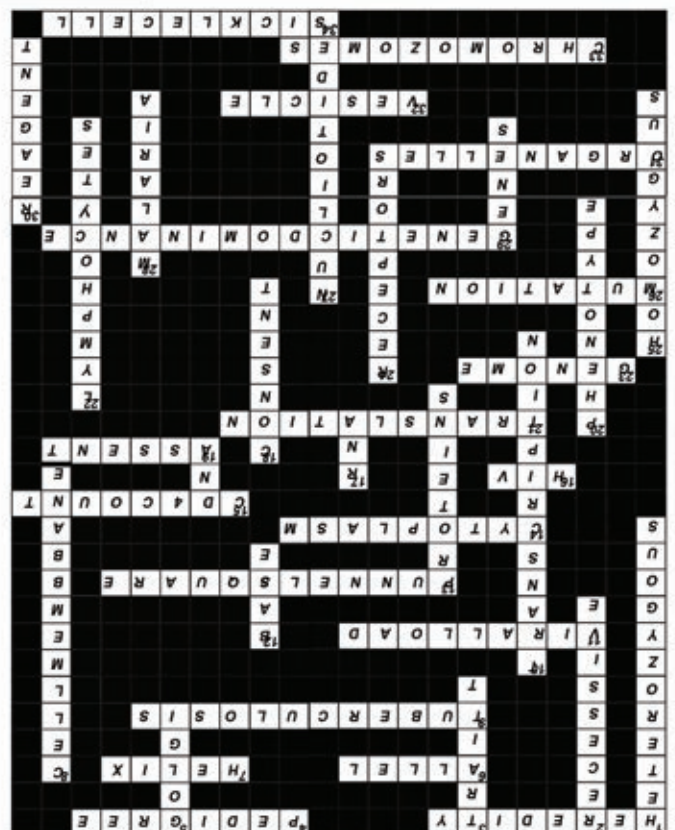
ACROSS

1. The process of passing traits and genetic characteristics from parents to their offspring.
4. A list of ancestors, a family tree.
6. One of two copies of each gene.
7. A coiled structure of DNA.
9. an infectious bacterial disease that can affect almost any tissue in the body, especially the lungs.
11. A measure of the number of viral particles present in an organism.
13. A diagram that is used to predict an outcome of a particular breeding experiment.
14. A jelly-like fluid that fills each cell and is enclosed by the cell membrane.
15. A lab test that measures the amount of CD4 cells.
16. A type of virus that infects and destroys the body's immune system.
19. An agreement by an individual not competent to give legally valid, informed consent.
21. The process at which proteins are created at ribosomes.
23. All the collective DNA contained in the chromosomes of an organism.
26. A change in the DNA code, an addition, a deletion or a substitution resulting in a different protein being produced.
29. When a certain trait is stronger than its opposite.
31. several membrane-bound compartments with specialized functions that are present in the cell cytoplasm.
32. A membrane-bound sac in plant or animal cells that is involved in storage or transport of the products of metabolism.
33. Linear strands of DNA found in the nucleus of most living cells, carrying genetic information in the form of genes.
34. An abnormal, crescent shaped red blood cell containing defective haemoglobin, caused by a heredity disease called sickle cell anaemia.

ANSWERS

DOWN

1. Two different forms of a gene.
2. An allele/gene copy most likely to stay hidden in offspring.
3. Specific physical characteristics of organisms that make them unique.
5. An organelle consisting of a stack of flattened sacs that is involved in the modification and sorting out of proteins.
8. A thin biological membrane that separates the contents of the cell with the external environment.
10. A process involved with the synthesis of proteins where a DNA template is used to make RNA.
12. A building block of DNA.
13. Molecules composed of one or more chains of amino acids.
17. Ribonucleic acid.
18. An agreement by an individual that is competent to give legally valid, informed consent.
20. The set of observable characteristics of an individual resulting from the interaction of its genotype with the environment.
22. Small leucocytes (white blood cells) with a single round nucleus, occurring especially in the lymphatic system.
24. Protein molecules on the surface of cells to which complementary molecules such as hormones or antibodies recognize and bind.
25. An individual having two identical alleles of a particular gene or genes and so breeding true for the corresponding characteristic.
27. The building blocks of nucleic acids, RNA and DNA.
28. An infectious disease caused by parasites such as mosquitoes.
29. Part of every cell that carries information that determines the features or characteristics inherited from parents.
30. Extra ingredients added to blood to break up cells and isolate DNA.



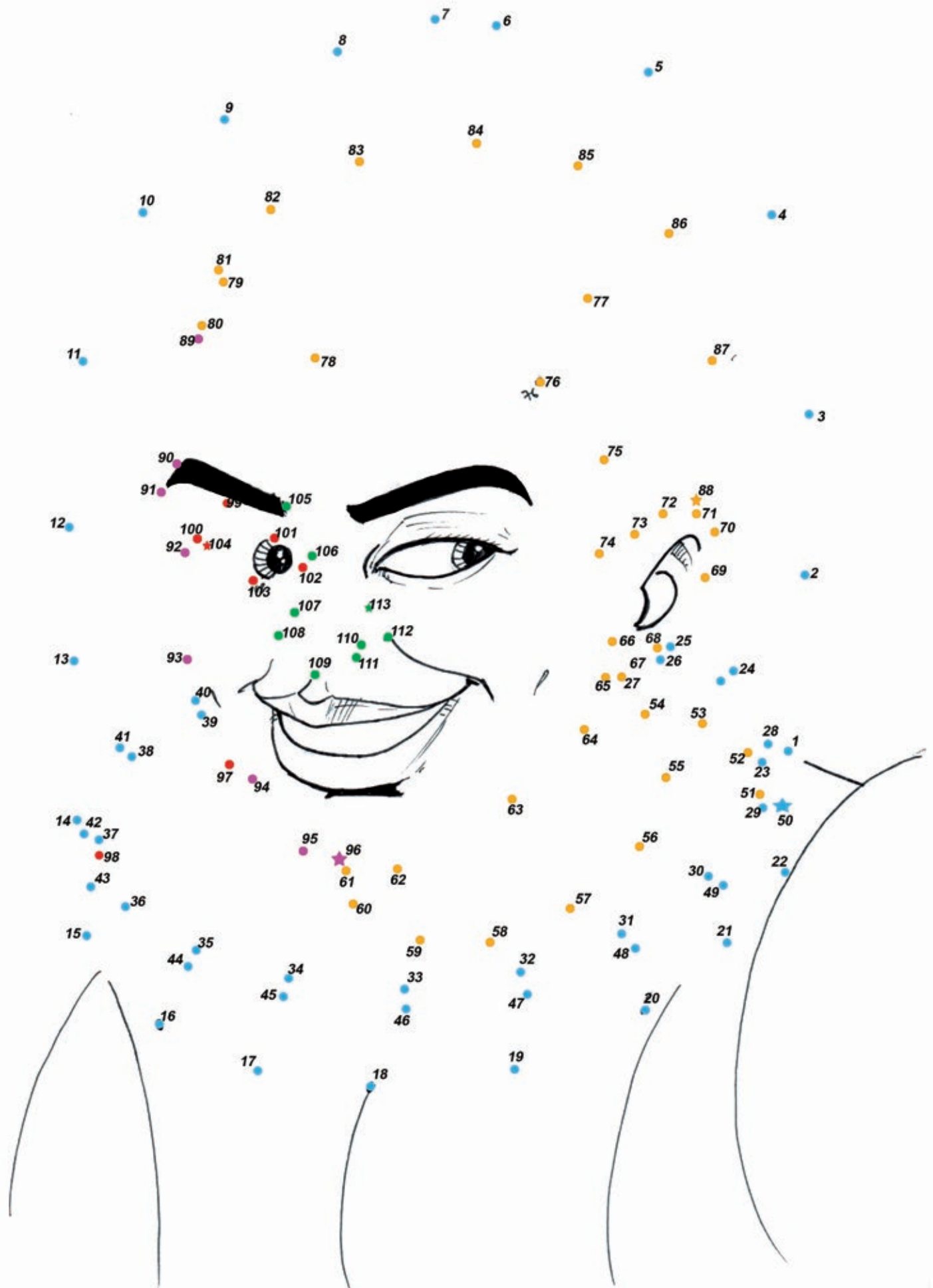


GENOME

ADVENTURES



CONNECT THE DOTS...





GENOME ADVENTURES

GENOME ADVENTURES IS AN INNOVATIVE WELLCOME TRUST-FUNDED COMMUNITY ENGAGEMENT INITIATIVE OF THE COLLABORATIVE AFRICAN GENOMICS NETWORK (CAFGEN). CAFGEN IS A MEMBER OF THE HUMAN HEREDITY AND HEALTH IN AFRICA CONSORTIUM (H3AFRICA) AND IS COORDINATED BY THE BOTSWANA-BAYLOR CHILDREN'S CLINICAL CENTRE OF EXCELLENCE (COE). GENOME ADVENTURES UTILIZES CAPACITY BUILDING WORKSHOPS, EDUCATIONAL COMICS, AND SOCIAL MEDIA TO ENGAGE COMMUNITY STAKEHOLDERS, MEDIA PRACTITIONERS, AND THE GENERAL PUBLIC - ESPECIALLY THE YOUTH - IN GENOMICS AND BIOMEDICAL RESEARCH. OUR GENOME ADVENTURES COMIC BOOK SERIES AIMS TO EDUCATE READERS ON THE HISTORY OF HEREDITY AND GENETICS, THE STRUCTURE AND FUNCTION OF DNA AND GENES, THE LINK BETWEEN GENOMICS AND HEALTH, AND THE PROCESS FOR ENROLLING IN A BIOMEDICAL OR GENOMICS RESEARCH STUDY, INCLUDING ETHICAL ISSUES PERTAINING TO INFORMED CONSENT, SAMPLE SHIPPING AND STORAGE, AND COMMUNITY ENGAGEMENT.

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