HIV HYSTERIA

CREATED BY RICARDO LOPERENA
ART DIRECTOR, PENCILER
RICARDO LOPERENA

COLORING
LUIS J. BRIGANITTY

COORDINATOR
ABE SCHWARTZ, PhD

SPECIAL ASSISTANTS
FELIPE PADILLA
ODALIS GARCÍA

CONSULTANTS
LYDIA E. SANTIAGO, PhD

CONTACT INFORMATION:
Emma Fernández-Repillet, Ph.D.
Principal Investigator
Biomedical Research Education Program of Puerto Rico
Biomedical Building No. 1, Suite 295
PO Box 365067
San Juan, Puerto Rico 00936-5067
Telephone: (787) 764-7074
Fax: (787) 274-1639
Email: efernandez@rcm.upr.edu
Website: http://brep.rcm.upr.edu.
Dr. UPR, this is Dr. Ponce, we have terrible news! There has been a security breach and hundreds of the enlarged HDV viruses you sent us have escaped! My security people think that some enzyme released by the viruses weakened the containment units.

Right, low budget zombie flick at its best.

Rita, I didn’t like that movie!

Ha ha, you should have seen your face Rick when they transformed!
I thought it was cool.

They must have hired a science consultant that doesn't know the difference between DNA and RNA.

You know it's not possible to alter the DNA the way they did.

Don't worry, Rita. Next time, I pick the movie.

I still can't believe we had to pay entrance for Bubu and Ruffles.

Hey! What's wrong with Ruffles?

Oh, no!

Hey, what is it? The last time I saw you, you were upset because you were attacked by an easy.

Manuel, can you hear me?

Ruuuuunn!

Hey Doc, I hope it's good news. What's up?
MANNY, THAT'S YOUR CAR!

MANUEL, WE'LL GO BACK FOR FOR YOUR CAR LATER! COME ON!

THREE HOURS LATER, THE TEAM FINALLY MAKES IT TO THE LAB.

WELL GOOD, BECAUSE I NEED TO LIE DOWN, RICK WEIGHS A TON.

THANKS FOR THE RIDE MANUEL, YOU'RE AWESOME!

I THINK WE LOST THEM.

WE BETTER GET RUFFLES INSIDE, HE SEEMS REALLY STARTLED.

I DO NOT!

COME'ON BUBU!

I THINK RICK BROKE MY BACK.

I AM REALLY TIRED!
Doc, you should have seen it! It was wild. They covered Manny's car with cytoplasm... and... and...

Is everyone okay?

DID YOU HAVE TO MENTION MY CAR?

Don't worry, Ruffles, it's okay.

Hey look, Ruffles is trying to say something.

Rick, remember when you saved me from that HIV virus when we met? Well, my family was not so lucky. We were circulating in the bloodstream when we were attacked by the HIV.

The attack was brutal. The viruses attacked my father by attaching themselves to the gp120 proteins in his cell membrane.

Then, the viral capsule entered into his cell body.

Inside, the virus capsule broke down and released two RNA strands.

The RNA was reverse replicated to DNA.

The DNA entered into his nucleus.

The DNA fused with the nuclear DNA and formed messenger RNA.
These RNA molecules entered his mitochondria and ordered it to produce thousands of copies of the HIV RNA.

The RNA copies traveled back to the gp120 proteins on the cell surfaced membrane.

The RNA covered with membrane molecules led him to attack other members of my CD4 family.

I was lucky. I was drawn into the sample of blood the doctor took for research testing just before the HIV attacked me.

Boy, you really were lucky. Too bad about your family, I am really sorry.

How did you escape the HIV attack?

Hey Rick, aren’t you going to bed?

Well, later people.

Yes Rick, tomorrow will be a long day.

OK guys, let’s go to bed we have a full day tomorrow. I will contact the center for disease control so they can help us locate the viruses.
I'll go in a while.

Hey, Ruffles, are you doing OK now?

Hey, who's out there?

Oh man, can't a guy get a decent sleep around here?

Rick?

Ouch!

Dr. Upri keeps snoring...
Hey Rita, quick, get some bleach!

I'll get the broom!

Rick!

Get these things off me.

Right away!

Hey rita, quick, get some bleach!

I'll get the broom!

Grumble, grumble... What's all the racket going on here!

Dr. Upr, why did they cover my car and how did they know to come here to the lab?

The lab is being attacked by hundreds of HIV viruses!

That means that more of the HIV viruses will be coming to the lab and we better be ready for them.

I think they followed a trail of receptors that ruffles shed. Those molecules are very specific to CD4 lymphocytes like ruffles.
Quick, get in your biohazard battle suits and use the sprayer backpack's with bleach! Go get them!

Margarita, I'll take care of Rick. You go with the team.

I'll check all the closets, they like dark areas.

That leaves the research laboratories... Huh?

Yikes! Look at all those HIV viruses.

Whoa!

I'm here Rita!

Maggie, I think you are going to need more than a broom for this job.

Well, maybe you will need to use your martial arts on this one.

Ok, Rita, you spray the ones on the lab benches and I will get the ones on the floor.

That leaves me to take care of the viruses trying to open the storage vault of blood.
OK RITA! DO YOUR THING!

BLEACH WILL TAKE CARE OF IT!

Oomf!

SO LITTLE GUY... YOU WANT TO PLAY ROUGH HUH?

SPLOOSH!

OK!

YOU GOT IT! HYYYYYAAAA!!!

OH NO! THE STORAGE VAULT WITH BLOOD DONATIONS IS BEING ATTACKED!
I can't let them break into the storage vault. That blood comes from people who donated it for people who need it.

Uh oh...

Ahh!

Good job team. I think we got all of them.

You were right, Maggie. I did need to use my capoeira training this time.

That wasn't so hard. The bleach was really effective on them.

I wonder how Rick is doing. He was all covered with those viruses.

I am sure he is okay. Dr. Up is checking him out now.
BIOMED BATTLE TEAM™

DEFINITIONS

- **AIDS** - an epidemic disease caused by an infection of the human immunodeficiency virus (HIV), a retrovirus that causes immune system failure and debilitation and is often accompanied by infections such as tuberculosis; it is spread through direct contact with bodily fluids especially by sexual contact or contaminated needles.

- **Acquired** - means that the disease is not hereditary but develops after birth from contact with a disease-causing agent (in this case, HIV).

- **Cell Membrane** - the semi-permeable membrane that encloses the cytoplasm of a cell, also called cytomembrane or plasma membrane.

- **Center for Disease Control** - the CDC is the federal agency responsible for administering national programs for the prevention and control of communicable and vector-borne diseases; it also directs quarantine activities and conducts epidemiological research.

- **CD4** - a glycoprotein predominantly found on the surface of helper T cells that in humans it is a receptor for HIV, enabling the virus to gain entry into its host.

- **Cytoplasm** - the substance within a cell including the organelles and the fluid surrounding the nucleus.

- **DNA** - deoxyribonucleic acid; the genetic material in cells that holds the inherited instructions for growth, development, and cellular functioning.

- **Enzyme** - any of numerous proteins or conjugated proteins produced by living organisms and functioning as biochemical catalysts.

- **gp120 Proteins** - exposed on the surface of the viral envelope, these glycoprotein binds to the CD4 receptor on any target cell that has such a receptor, particularly the helper T-cell.

- **HIV** - a retrovirus that causes AIDS by infecting helper T cells of the immune system, the most common serotype, HIV-1, is distributed worldwide, while HIV-2 is primarily confined to West Africa.

- **Immunodeficiency** - means that the disease is characterized by a weakening of the immune system.

- **Lymphocytes** - white blood cells involved in the body's immune system; B-lymphocytes mature into cells that produce antibodies; T-lymphocytes help to protect against infections and they are divided into helper cells, suppressor cells, and cytotoxic cells; natural killer (NK) lymphocytes destroy infected cells.

- **Messenger RNA** - the form of RNA that mediates the transfer of genetic information from the cell nucleus to ribosomes in the cytoplasm, where it serves as a template for protein synthesis; is synthesized from a DNA template during the process of transcription.

- **Mitochondria** - spherical or rod-shaped structures of the cell that contain genetic material (DNA and RNA) and are responsible for converting food to energy.

- **Nucleus** - a large, membrane-bound, usually spherical protoplasmic structure within a living cell, containing the cell's hereditary material and controlling its metabolism, growth, and reproduction.

- **Outbreak** - a sudden increase: an outbreak of influenza.

- **Receptors** - a structure located on the outside of a cell's membrane that causes the cell to attach to specific molecules; the molecules are then internalized, taken inside the cell, and they either activate or inhibit certain cellular functions.

- **RNA** - ribonucleic acid, a nucleic acid that transmits messages in the DNA to other elements in the cell.

- **Stigma** - a mark indicating a defect or something not normal.

- **Syndrome** - refers to a group of symptoms that collectively indicate or characterize a disease. In the case of AIDS this can include the development of certain infections and/or cancers, as well as a decrease in the number of certain cells in a person's immune system.

- **Viral Capsule** - protein shell that encases the virus single strand of genetic information.

- **Virus** - any of various simple submicroscopic parasites of plants, animals, and bacteria that cause disease and that consist essentially of a core of RNA or DNA surrounded by a protein coat is unable to replicate without a host cell and typically not considered living organisms.
**Facts Related to AIDS**

**WARNING:** HIV CAUSES AIDS. AIDS IS A FATAL DISEASE. THERE IS NO CURE FOR HIV INFECTION.

HIV stands for "Human Immunodeficiency Virus" and AIDS stands for "Acquired Immune Deficiency Syndrome". As time goes by, a person who has been infected with HIV is likely to become ill more and more often until (usually several years after infection) they become ill with one of a number of particularly severe illnesses. When the number of immune system cells left in their body drops below a particular point, it is identified as AIDS. AIDS is a fatal disease which has no cure. It is responsible for millions of deaths each year.

In the search for a cure, AIDS treatment has advanced in a way that it can prolong the life of a person by a number of more years. The best way to fight it is through prevention. It is a disease that has many ways of being acquired, but also various ways to avoid getting infected entirely.

AIDS education is very important to help in protecting yourself from acquiring it. The more you know about it, the more you'll be able to protect yourself against it. Many resources are available for this, such as books, magazines, the internet, even your teachers at school may give you information that can help. The best weapon in the fight against AIDS is education and prevention!

**Human Immunodeficiency Virus**

**Acquired Immune Deficiency Syndrome**

**Translational Research**

**Basic Research (Discoveries)**
- Pre-clinical (animal models, monkeys)
- Clinical Trial (doctors and patients)
- Community Outreach (prevention, treatment)

**UNIVERSITY OF PUERTO RICO SCIENTISTS ACTIVE IN AIDS RESEARCH**

- **Dr. José Rodriguez-Orense**
  - Ph.D.
  - Professor Dept. of Biochemistry
  - Intracellular Pharmacology of HIV agents
  - Place of Birth: Yauco, Puerto Rico

- **Dr. Leyda Meléndez**
  - Ph.D.
  - SNRP Investigator
  - Professor, Dept. of Microbiology and Medical Zoology
  - Pathogenesis of HIV and how it affects cell membrane receptors
  - Place of Birth: San Juan, Puerto Rico

- **Dr. Carmen Zorrilla**
  - M.D.
  - Professor School of Medicine
  - Director the CEME Program
  - Place of Birth: San Juan, Puerto Rico

- **Dr. Clorinda Díaz**
  - M.D.
  - Professor School of Medicine
  - Director of the Dept. of Pediatrics RCM and the WITS Program
  - Studies the impact of HIV infection on HIV infected women and their infants
  - Place of Birth: San Juan, Puerto Rico

- **Dr. Edmundo Kreisierburg**
  - Ph.D.
  - Professor, Dept. Microbiology, School of Medicine
  - Director of the Unit of Comparative Medicine
  - immune responses in rhesus macaques against pathogenic simian immunodeficiency virus (SIV)
  - Place of Birth: Buenos Aires, Argentina

- **Dr. Lydia E. Santiago Andújar**
  - Ph.D.
  - Behavioral studies in relation to the HIV/AIDS epidemic
  - Place of Birth: Salinas, Puerto Rico

- **Dr. Valerie Wojna**
  - M.D.
  - Professor of Neurology
  - Director of the Clinical Neurophysiology Lab
  - Monitoring a cohort of HIV infected women at risk of HIV dementia
  - Place of Birth: Caguas, Puerto Rico
MYTH:
HIV (HUMAN IMMUNODEFICIENCY VIRUS) IS THE VIRUS THAT ATTACKS THE IMMUNE SYSTEM THAT FIGHTS DISEASES. WITHOUT THIS SYSTEM THE BODY IS DEFENSELESS RESULTING IN AIDS (ACQUIRED IMMUNODEFICIENCY SYNDROME). IT CAN TAKE MONTHS TO YEARS TO DEVELOP AIDS ONCE
GOOD MORNING! IT TOOK YOU GUYS LONG ENOUGH TO KNOCK OFF THOSE HIV VIRUSES.

AHHHH!

HEY, WHAT’S WITH THE WEIRD ATTITUDE? I’M FINE, NOT A SCRATCH ON ME.

OH, IT’S NOTHING! REALLY!

HEY, HOW ABOUT SOME LEMONADE, MANUEL?

AH, SORRY, WE JUST RAN OUT.

NO YOU DIDN’T. I SEE SOME IN THE PITCHER.

AH, WELL, WE DON’T HAVE ANY MORE GLASSES.
OH, THAT’S JUST GREAT. YOU THINK RICK HAS HIV? LOOK GUY’S, YOU HAVE A LOT TO LEARN.

I CAN’T BELIEVE THIS.

BUT HE, HE...

ME NEITHER!

**MYTH:**
SHARING MEALS, DRINKS, CUPS OR CUTLERY WILL TRANSMIT THE HIV VIRUS.

**FALSE:** THE HIV VIRUS LIVES IN BODILY FLUIDS AND CANNOT SURVIVE FOR LONG WHEN EXPOSED TO AIR AND CANNOT BE TRANSMITTED FROM ONE PERSON TO ANOTHER BY SHARING EATING UTENSILS.
ON THAT SAME MORNING...

I heard about HIV viruses attack last night; how awful!

Lots of packages today...

Good, we have been waiting for some of those chemicals for an experiment.

By the way, could I use your restroom?

Sure, it is at the end of the hallway.

It was, but we have everything under control now.
MYTH: YOU CAN GET HIV BY USING A PUBLIC RESTROOM.

FALSE: AGAIN THE VIRUS LIVES IN BODILY FLUIDS AND CANNOT Survive FOR LONG WHEN EXPOSED TO AIR. NO ONE HAS BEEN IDENTIFIED AS INFECTED WITH HIV DUE TO CONTACT WITH AN ENVIRONMENTAL SURFACE. ADDITIONALLY, HIV IS UNABLE TO REPRODUCE OUTSIDE ITS LIVING HOST.
OUT IN THE LABS AT THE BOTANICAL GARDEN...

WHAT ARE YOU GUYS DOING?

NOTHING!!

WHY ARE YOU SPRAYING THE BACKYARD NOW, IT IS THE MIDDLE OF THE DAY YOU SHOULD BE WORKING IN THE LAB.

WELL, YOU CAN NEVER BE SAFE ENOUGH.

YEAH, MANUEL IS RIGHT, NEVER SAFE ENOUGH.

SAFE ENOUGH FROM WHAT?

WELL, YOU KNOW ABOUT MOSQUITOES, BLOOD, HIV.

YES, YOU CAN NEVER BE SURE WHO THE MOSQUITO BIT BEFORE IT BITES YOU...
I CAN NOT BELIEVE THIS. DR. UPR SAYS THAT I AM OK AND YOU GUYS DO NOT BELIEVE IT.

HOW DO WE KNOW THAT HE IS RIGHT?

THOSE HIV VIRUSES WERE ALL OVER YOU, HOW CAN WE BE SURE THAT YOU ARE NOT INFECTED?

MYTH: MOSQUITOES CAN TRANSMIT THE HIV VIRUS FROM PERSON TO PERSON. THIS IS FALSE: WHEN AN INSECT BITES A PERSON, IT DOES NOT INJECT ITS OWN BLOOD OR BLOOD FROM A PREVIOUSLY BITTEN PERSON OR ANIMAL INTO THE NEXT PERSON BITTEN. RATHER, IT INJECTS SALIVA, WHICH ACTS AS A LUBRICANT SO THE INSECT CAN FEED EFFICIENTLY. DISEASES SUCH AS YELLOW FEVER AND MALARIA ARE TRANSMITTED THROUGH THE SALIVA OF SPECIFIC SPECIES OF MOSQUITOES. HOWEVER, HIV LIVES FOR ONLY A SHORT TIME INSIDE AN INSECT AND, UNLIKE ORGANISMS THAT ARE TRANSMITTED VIA INSECT BITES, HIV DOES NOT REPRODUCE (AND DOES NOT SURVIVE) IN INSECTS.

AH, OF COURSE NOT, BUT, YOU KNOW, WHAT IF WE CATCH IT FROM YOU?

SO, WHAT IF I DID HAVE HIV? DOES THAT MEAN YOU'RE NOT GOING TO HANG OUT WITH ME ANY MORE?
I mean you were really covered with those things.

Even if Rick was infected, you couldn't catch it from him by touching. Reta, you could even kiss him without catching it.

Now wait a minute. Like I told Rick, you cannot get HIV by touching. The virus must enter your bloodstream to infect you.

Ugh, kissing my own brother! What an awful thought, with or without HIV.

Geez, will you guys chill.

Hey, it's cool...

Yeah I guess, but...

Should we tell them?

Doc, it is just that we are not really sure...
YOU GUYS AREN'T KIDDING ARE YOU? YOU ONLY NEED TO SEARCH THE NET FOR INFORMATION ABOUT HIV/AIDS! THERE IS A TON OF IT AND ALL ABOUT THE MYTHS RELATED TO AIDS. I WOULD HAVE THINK THAT YOU DID THAT ALREADY.

WELL... UHMM... GEEZ... UU HHH... WE DID BUT STILL...

OK! THAT'S IT!

SO IT DOESN'T MATTER! I'LL STILL BE HERE FOR YOU!

WHAAAAHH HHAALLL!!

EVEN IF YOU DO HAVE HIV AND WILL GET AIDS, I'M STILL YOUR TWIN SISTER.

AWWW, HOW TOUCHING...

COOL IT RITA, THIS ISN'T GOOD FOR MY IMAGE...

HMMPPHH!!

OK, LET'S CLEAR THIS UP ONCE AND FOR ALL. I WILL PERFORM A RAPID HIV DIAGNOSTIC TEST THAT WILL TELL US IF RICK IS HIV POSITIVE OR NEGATIVE.

THE DOCTOR TAKES A BLOOD SAMPLE FROM RICK'S FINGER WITH A LANCET.

PLACING THE DROP OF BLOOD FROM THE FINGER ONTO A TEST STRIP.

THE TEAM WATCHES AS THE TEST STRIP DEVELOPS.

UHHGG... I CAN'T BELIEVE YOU GUYS.

WHO TOLD YOU TO PUT THOSE SUITS BACK ON!
...the test strip shows a negative result.

Well hey looks like there was nothing to worry about.

Awww! Yuki! Get off a me! Uuuuuggghh, now I got cooties!

Hey, hey, watch it now

Manuel, Rita, I think you owe Rick an apology.

Well I guess I'm... do I have to say it...

Yeah, yeah, I'm sorry I treated you that way. I couldn't help but get a bit worried about something like that.

Sorry, ummm... Rick

I didn't hear you
IM SORRY! IM SORRY! IM SORRY! I KNOW NOW THAT YOU CAN'T GET AIDS BY JUST BEEN CLOSED! I AM SORRY!

OK GUY'S ENOUGH MOPING; LET'S HAVE SOME FUN! HOW ABOUT A SOCCER GAME!

YEAH, GREAT IDEA!

IT IS ESTIMATED THAT 39.4 MILLION PEOPLE ARE LIVING WITH HIV. REMEMBER THAT THESE PERSONS CAN CONTRIBUTE TO OUR SOCIETY AND THAT TALKING ABOUT THE ISSUE IS NECESSARY TO PREVENT THIS DISEASE.

HEY RITA! OVER HERE!
These are beginners Sudoku puzzles. They consist of a $4 \times 4$-square grids subdivided into four $2 \times 2$ boxes. Some of the squares contain numbers. The object is to fill in the remaining squares so that every row, every column, and every $2 \times 2$ box contains each of the numbers from 1 to 4.

Solving a Sudoku puzzle involves pure logic. No guesswork is needed or even desirable. Getting started involves mastering just a few simple techniques. Good luck!

**SUDOKU PUZZLE 1**

```
  3
  1
  3
  4
```

**SUDOKU PUZZLE 2**

```
  3
  2
  1
  3
```
Lydia E. Santiago, PhD
Associate Professor
Co-Investigator
School of Public Health
Medical Sciences Campus,
University of Puerto Rico

Q When did you become interested in science?

I became interested in science in 1984 during the AIDS epidemic. Since then I have dedicated my career to combating the AIDS epidemic. I feel I have been privileged to see the strides made during the Aids epidemic since its beginning and most difficult times; when there were no treatments or medicines available to the ability to control the prenatal transmission of AIDS, the many advances in the understanding of the disease and the beginning of the search of a vaccine against HIV.

Q Where did you study your profession and why did you choose to study in that institution?

I am a graduate of the University of Puerto Rico, Rio Piedras Campus. I decided to study at the University of Puerto Rico because it is an honor to study in the University of Puerto Rico.

Q What do you do in your work?

I am a professor at the Graduate School of Public Health which has given me the opportunity to create programs to address the needs of people infected with AIDS and help them improve their quality of life.

Q What do you like best about your job?

The work I do has many challenges but even greater rewards. It offers me the opportunity to apply new scientific knowledge to improve the quality of life of people through education and the opportunity to reach communities that are greatly affected by AIDS.

Q What type of person makes a good scientist?

A good scientist should be disciplined, applied and responsible. He/Her should also be an inquisitive person who always formulates questions, does not conform with traditional answers and who is constantly in search for applying knowledge.

Q Do you have any suggestions for the BioMed Battle Team?

The BioMed Battle Team should motivate and investigators which will continue the work we have begun. The youth is inheriting a world with great advances in science and technology but also serious challenges. Tools such as the ones that the team promotes will help address current problems in order to leave a better place to next generations.
RESUELVA EL ACRÓSTICO Y DESCUBRE LA PALABRA ESCONDIDA EN LA COLUMNA VERDE.

1  
2  
3  
4  
5  
6  

env gp120  
env gp41  
gag p17  
gag p24  
RNA  

ANSWER: 1. MOSQUITO 2. OTRO PASO 3. VIRUS 4. GP12O 5. MITOCONDRIA 6. DNA
FIND THE PARTS FROM DRAWING "A" THAT ARE MISSING IN DRAWING "B". CIRCLE WITH A PENCIL THE PARTS THAT ARE MISSING IN DRAWING "A". THERE ARE A TOTAL OF 10 MISSING PARTS.
FIND AND DESTROY THE HIV VIRUS BEFORE IT CLAIMS THE LIFE OF ANOTHER HUMAN BEING.