



World of VIRUSES

Phantom Planet

World of VIRUSES



Graphic Novel

PHANTOM PLANET

written by **MARTIN POWELL**

art and letters by **TOM FLOYD**

scientific illustration by **ANGIE FOX**

Thanks to

ANISA ANGELETTI, Ph.D., Research Assistant Professor, School of Biological Sciences and
Nebraska Center for Virology, University of Nebraska–Lincoln

JUDY DIAMOND, Ph.D., Professor and Curator of Informal Science Education,
University of Nebraska State Museum

MOIRA RANKIN, President of Soundprint Media Center, Inc.

ADAM WAGLER, College of Journalism and Mass Communications,
University of Nebraska–Lincoln

CHARLES WOOD, Ph.D., Lewis Lehr/3M University Professor of Biological Sciences and
Director, Nebraska Center for Virology, University of Nebraska–Lincoln

The University of Nebraska is an Affirmative Action/Equal Opportunity institution.
© 2011, The Board of Regents of the University of Nebraska. All rights reserved.

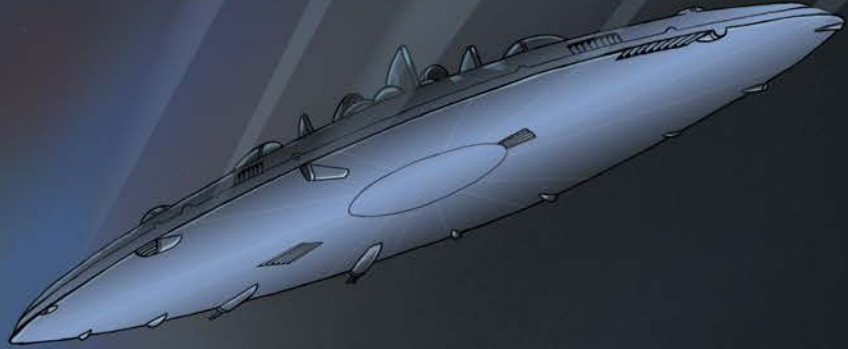
SEPA SCIENCE EDUCATION
PARTNERSHIP AWARD

Supported by the National Center for Research Resources, a part of the National Institutes of Health

UNIVERSITY OF
Nebraska
Lincoln

Phantom Planet


A MOMENTOUS EVENT.




PLANET EARTH, IN THE DISTANT FUTURE,
AS A LONG AWAITED DREAM IS FULFILLED.

AT LAST...*VISITORS FROM OUTER SPACE.*

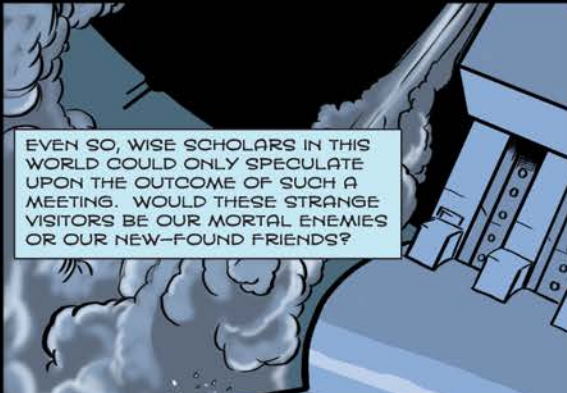




IT IS AN INCIDENT EPIC IN ITS PROPORTIONS, DEBATED THROUGHOUT THE CENTURIES BY SCIENTISTS AND PHILOSOPHERS.



IT WAS INEVITABLE, MOST PEOPLE BELIEVED, THAT SUCH CONTACT WOULD EVENTUALLY OCCUR.

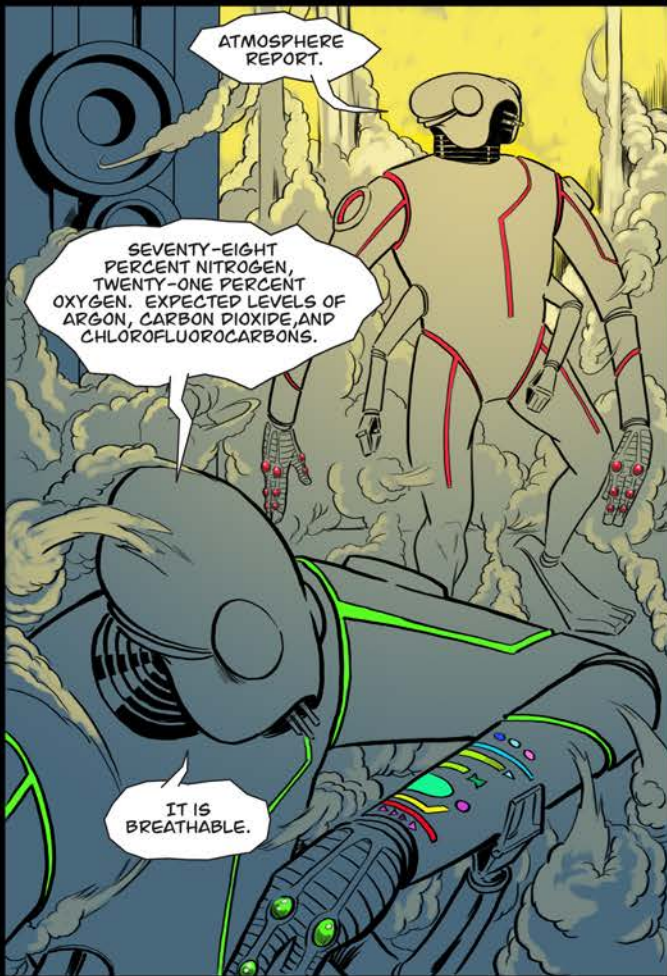


EVEN SO, WISE SCHOLARS IN THIS WORLD COULD ONLY SPECULATE UPON THE OUTCOME OF SUCH A MEETING. WOULD THESE STRANGE VISITORS BE OUR MORTAL ENEMIES OR OUR NEW-FOUND FRIENDS?

THAT SINGLE TROUBLING QUESTION REMAINED UNANSWERED...



UNTIL NOW.



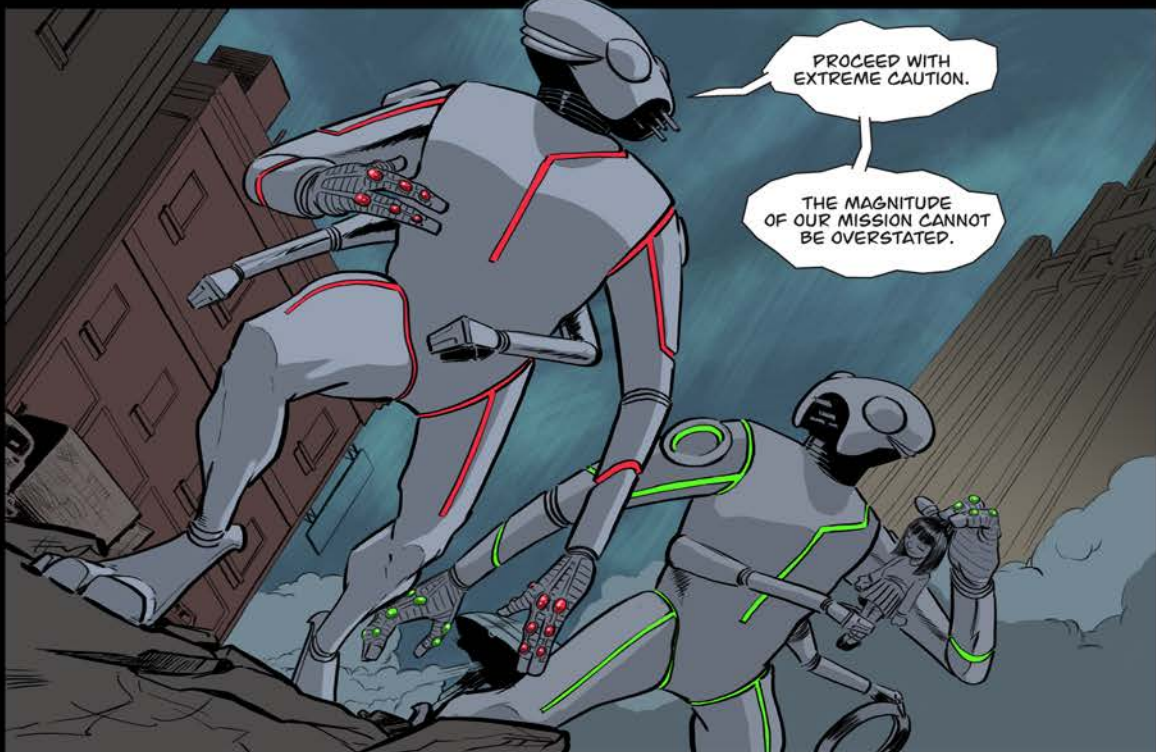
ATMOSPHERE
REPORT.

SEVENTY-EIGHT
PERCENT NITROGEN,
TWENTY-ONE PERCENT
OXYGEN. EXPECTED LEVELS OF
ARGON, CARBON DIOXIDE, AND
CHLOROFLUOROCARBONS.

IT IS
BREATHABLE.



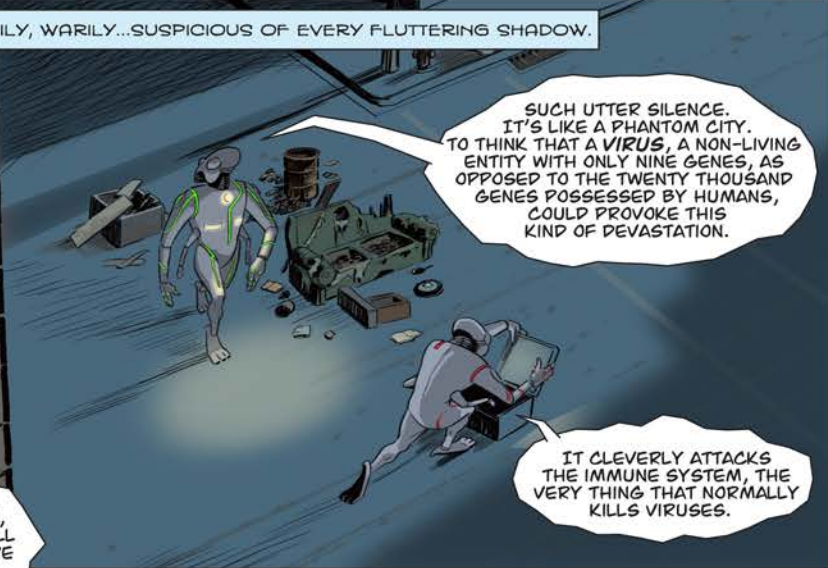
BUT POTENTIALLY
DANGEROUS. WHAT WE SEEK
IS NOT AIRBORNE, BUT OTHER
VIRUSES MAY BE. WE SHOULD
RETAIN OUR HELMETS.



PROCEED WITH
EXTREME CAUTION.

THE MAGNITUDE
OF OUR MISSION CANNOT
BE OVERSTATED.

THE VISITORS MOVE STEALTHILY, WARILY...SUSPICIOUS OF EVERY FLUTTERING SHADOW.



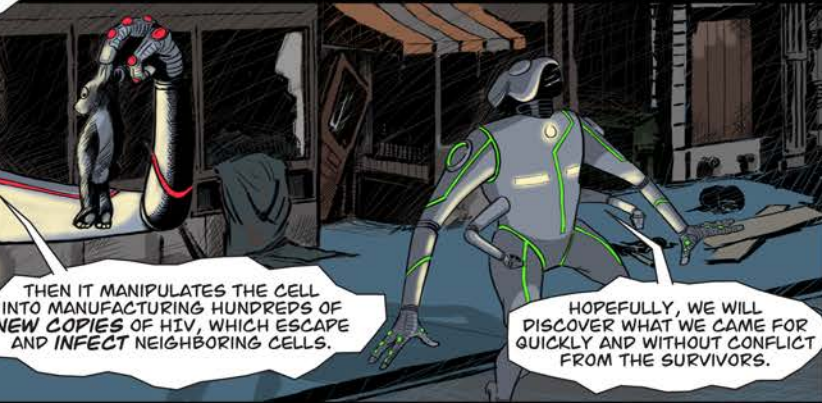
SUCH UTTER SILENCE. IT'S LIKE A PHANTOM CITY. TO THINK THAT A **VIRUS**, A NON-LIVING ENTITY WITH ONLY NINE GENES, AS OPPOSED TO THE TWENTY THOUSAND GENES POSSESSED BY HUMANS, COULD PROVOKE THIS KIND OF DEVASTATION.

IT CLEVERLY ATTACKS THE IMMUNE SYSTEM, THE VERY THING THAT NORMALLY KILLS VIRUSES.

BY GRABBING ONTO RECEPTORS ON THE SURFACE OF **IMMUNE CELLS**, THE VIRUS FUSES WITH THE CELL MEMBRANE AND THE VIRAL CORE RELEASES ITS GENETIC MATERIAL INSIDE THE CELL.



THEN IT MANIPULATES THE CELL INTO MANUFACTURING HUNDREDS OF **NEW COPIES** OF HIV, WHICH ESCAPE AND INFECT NEIGHBORING CELLS.



HOPEFULLY, WE WILL DISCOVER WHAT WE CAME FOR QUICKLY AND WITHOUT CONFLICT FROM THE SURVIVORS.



THEY'VE SEEN US!



REMAIN CALM. THEY ARE AS APPREHENSIVE AS WE ARE.

A SIGNAL-CORRESPONDING TO RFID* LOCATED TWO HUNDRED METERS IN FRONT OF US!

QUICKLY-BEFORE THE SURVIVORS REGROUP IN STRONGER NUMBERS.

THE VISITORS FOLLOWED A GRIM PATH, LITTERED WITH TRAGEDIES OF MANY GENERATIONS.

* RFID STANDS FOR RADIO FREQUENCY IDENTIFICATION, AN AUTOMATIC IDENTIFICATION TECHNOLOGY WHEREBY DIGITAL DATA ENCODED IN AN RFID TAG IS CAPTURED BY A READER USING RADIO WAVES. RFID TAGS CONSIST OF AN INTEGRATED CIRCUIT ATTACHED TO AN ANTENNA AND CAN BE AS SMALL AS A GRAIN OF RICE.

UNTIL, FINALLY...

WE MAY NOT GET A SECOND CHANCE. ARE YOU CERTAIN THERE IS NO MARGIN FOR ERROR?

ONE HUNDRED PERCENT.

THE SIGNAL ORIGINATES FROM INSIDE THIS BUILDING.

ONWARD, THEN.

WE MUST NOT FAIL.

NATIONAL LABORATORY FOR INFECTIOUS DISEASE

BSL 2

BSL 3

**BSL2 REFERS TO BIOSAFETY LEVEL TWO, THE MINIMUM LEVEL OF BIOCONTAINMENT REQUIRED TO HOUSE HIV AND SIMILAR BIOLOGICAL AGENTS. **BSL3 REFERS TO THE BIOSAFETY LEVEL RECOMMENDED FOR HANDLING DANGEROUS PATHOGENS.

MOMENTS LATER, IN THE LONG-ABANDONED MEDICAL LABORATORY...



WE'VE FOUND IT!

EXTRAORDINARY! EVERYTHING APPEARS INTACT.

THIS IS THE MOMENT WE'VE BEEN WAITING FOR.



ACCORDING TO THE SCANNER, THE SAMPLES OF HIV-RESISTANT CELLS WE NEED WERE PRESERVED IN THIS LABORATORY IN CRYOGENIC SUSPENSION.



THEY MUST BE CONTAINED IN HERE.

SOMEHOW... I FEEL LIKE A THIEF.

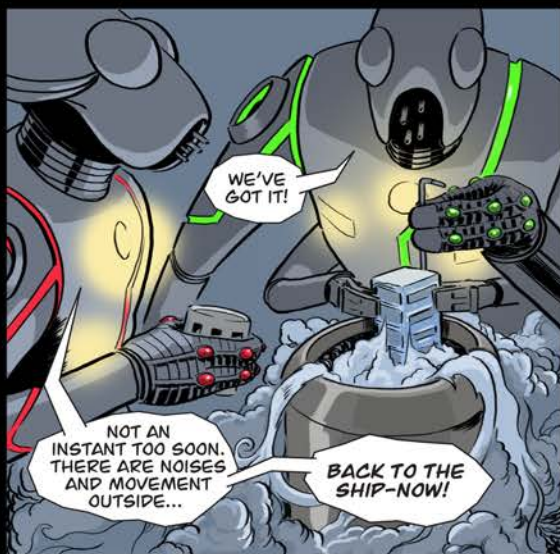
NONSENSE. IT IS OF NO USE TO THE SURVIVORS IN THIS DYING WORLD. ONLY WE FULLY COMPREHEND ITS VALUE.



WE'VE GOT IT!

NOT AN INSTANT TOO SOON. THERE ARE NOISES AND MOVEMENT OUTSIDE...

BACK TO THE SHIP-NOW!





THAT SMALL GROUP FROM THE STREET. SHOULD WE TRY TO REASON WITH THEM?



NO, THEY WOULDN'T UNDERSTAND...BUT SOMEDAY THEY WILL-

AFTER A FEW FRANTIC MINUTES, THE VISITORS REACH THEIR DESTINATION...



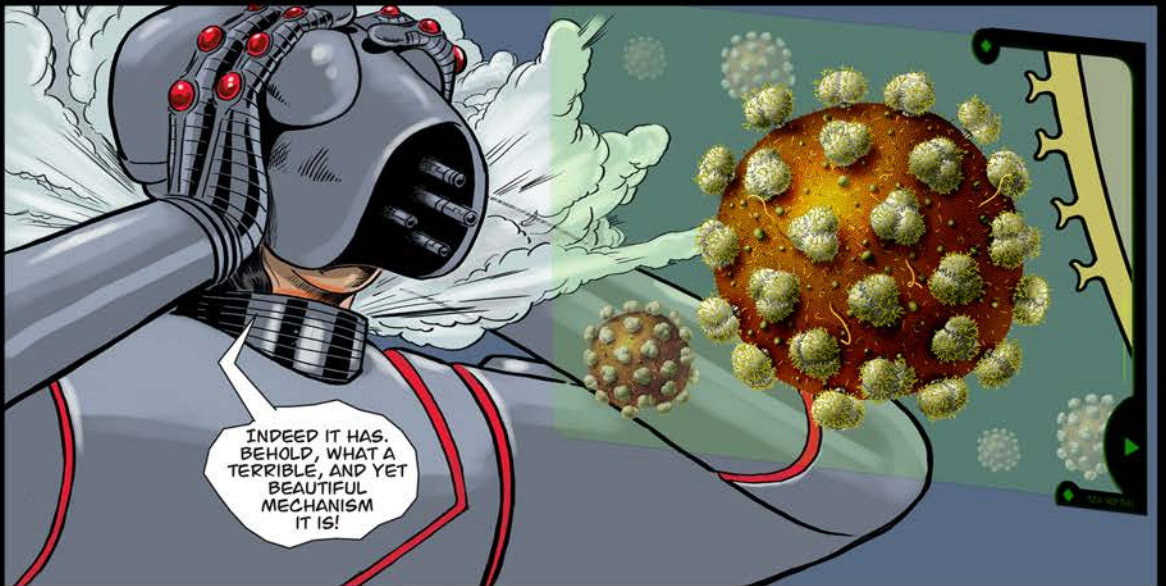
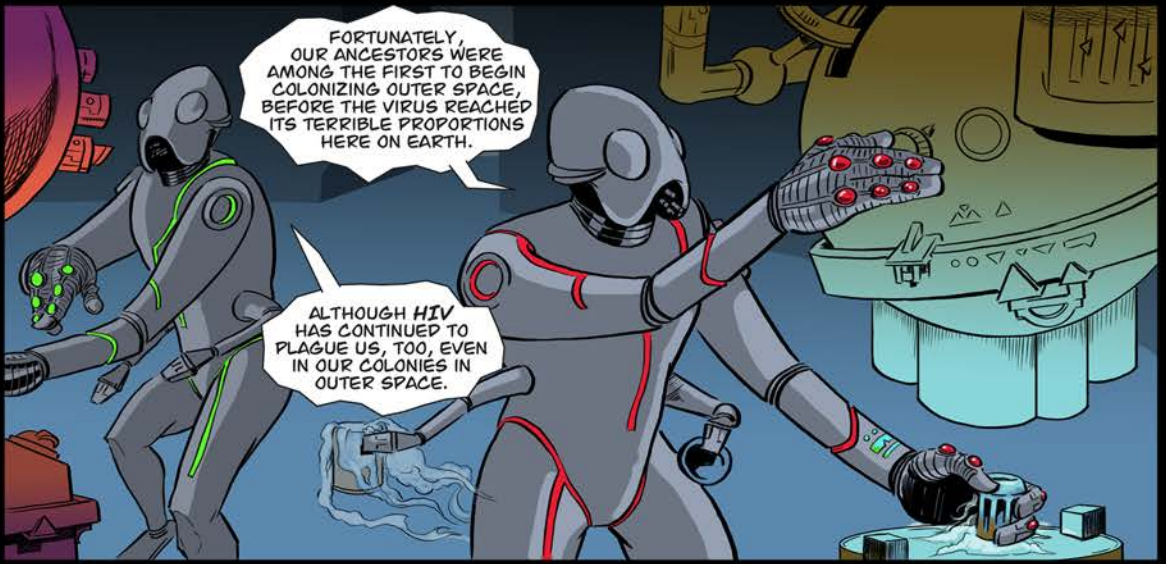
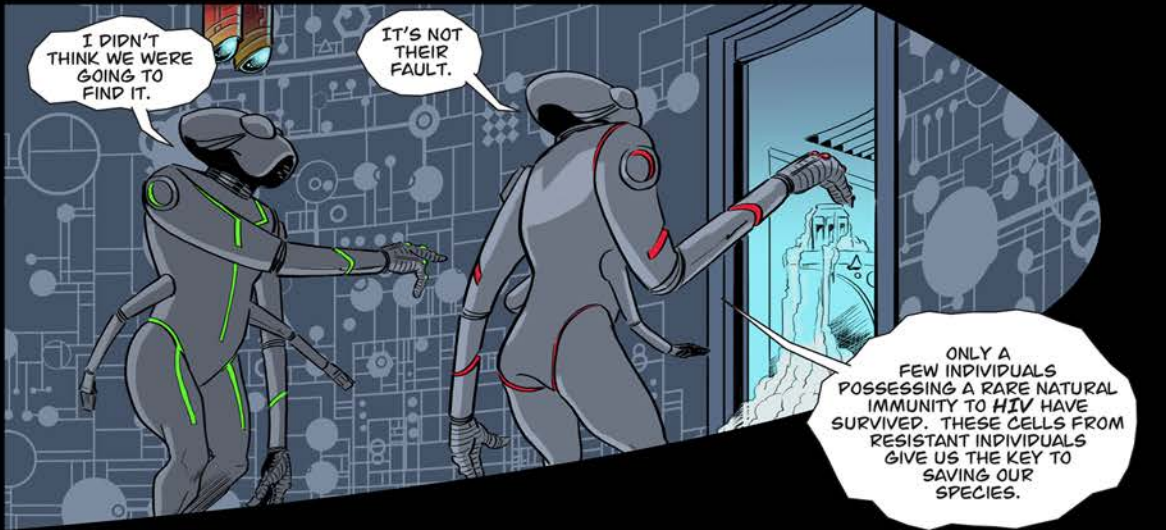
WE COULD HELP THEM...

LATER... WE WILL RETURN.

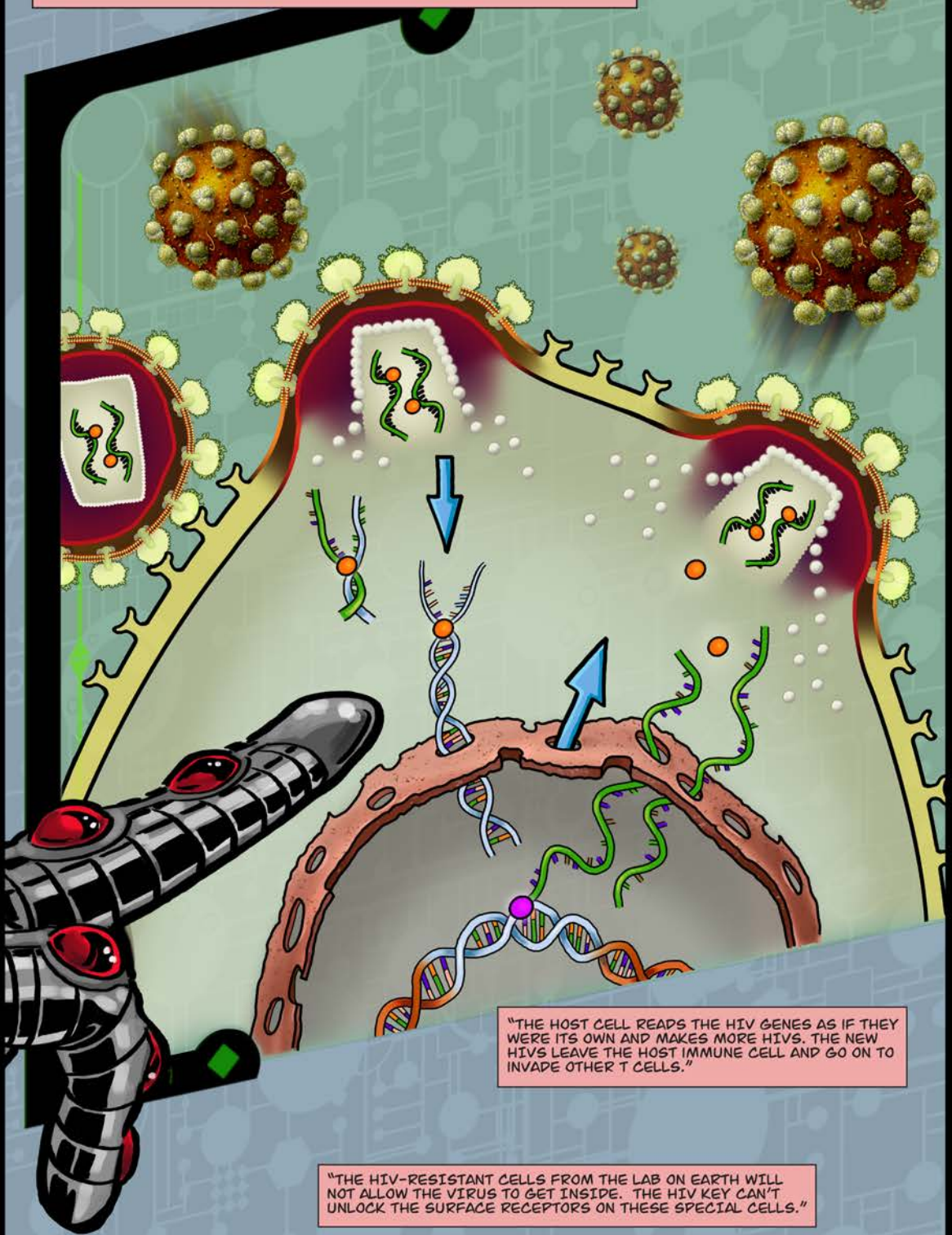
THEN, WITH A SHIMMERING AURA, AND A CRACKLE OF OZONE, THE SPACECRAFT RISES SILENTLY, SWIFTLY CLIMBING INTO THE STORMY SKY.



"MISSION ACCOMPLISHED."



"IN OUR BODIES, HIV WRECKS HAVOC WITH THE VERY CELLS THAT PROTECT US AGAINST VIRUSES. HIV LATCHES ONTO THE RECEPTORS OF THE IMMUNE SYSTEM'S T CELL LIKE KEYS IN A LOCK. THE VIRUS FUSES WITH THE T CELL AND RELEASES ITS GENES INSIDE. THE HIV GENES, IN THE FORM OF RNA, ARE CONVERTED INTO DNA AND INSERTED INTO THE HOST CELL'S DNA."



"THE HOST CELL READS THE HIV GENES AS IF THEY WERE ITS OWN AND MAKES MORE HIVS. THE NEW HIVS LEAVE THE HOST IMMUNE CELL AND GO ON TO INVADE OTHER T CELLS."

"THE HIV-RESISTANT CELLS FROM THE LAB ON EARTH WILL NOT ALLOW THE VIRUS TO GET INSIDE. THE HIV KEY CAN'T UNLOCK THE SURFACE RECEPTORS ON THESE SPECIAL CELLS."



IT COULD TAKE UP TO TWENTY YEARS BEFORE THE IMMUNE SYSTEM FAILS, BUT THE OUTCOME IS THE SAME: HUMANS BECOME VULNERABLE TO RARE DISEASES THAT WOULD NEVER BE ABLE TO HARM A HEALTHY IMMUNE SYSTEM.

NOW, WITH THIS SAMPLE, WE HAVE THE POSSIBILITY TO ERADICATE HIV FOREVER!



IT WON'T BE EASY. WE STILL HAVE NO SURE WAY OF IDENTIFYING THE MECHANISM OF RESISTANCE IN THE CELLS OF THE SURVIVORS.

NOT YET, BUT WE WILL.

WE MUST MAKE PEACE WITH EARTH'S HIV SURVIVORS AND WORK WITH THEM TO DISCOVER HOW THEY HAVE RESISTED THE VIRUS.

AT LAST, THE HOPE OF HUMANITY'S SALVATION IS WITHIN OUR REACH.

THE BEGINNING...