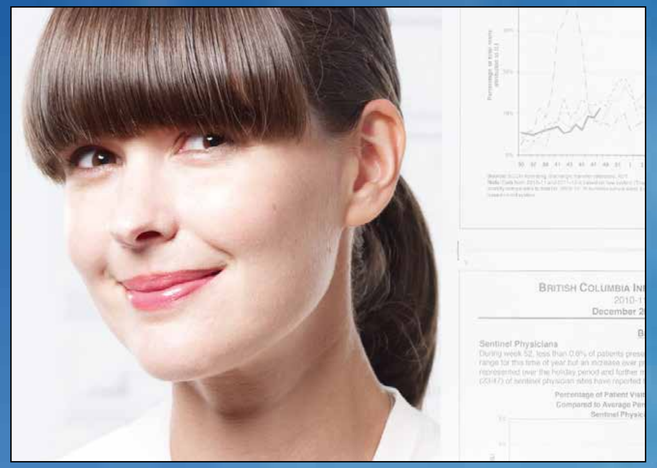
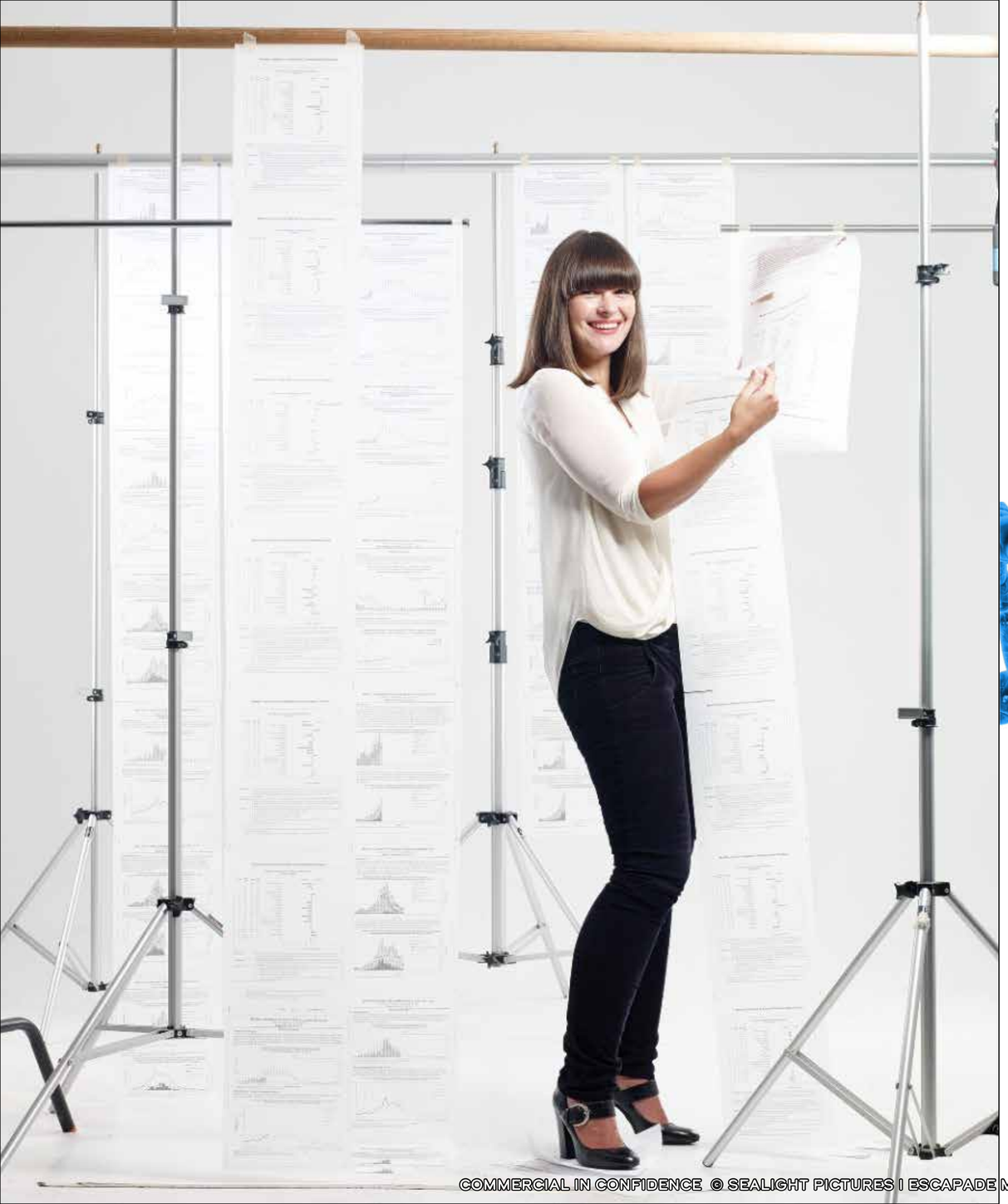
The genetic revolution is here. Are you ready for it?

6x60, 4K

HARNESSING THE GENE GENIE

With Dr Jenn Gardy





SYNOPSIS

From heredity, to technology, to miracle cures in medicine, agriculture and energy...

Genetics is a subject that touches every aspect of our lives. Our DNA, in fact, is the essence of what makes us human.

Advancements in science and supercomputers have coalesced, opening the door to a future that seems beyond our imagination.

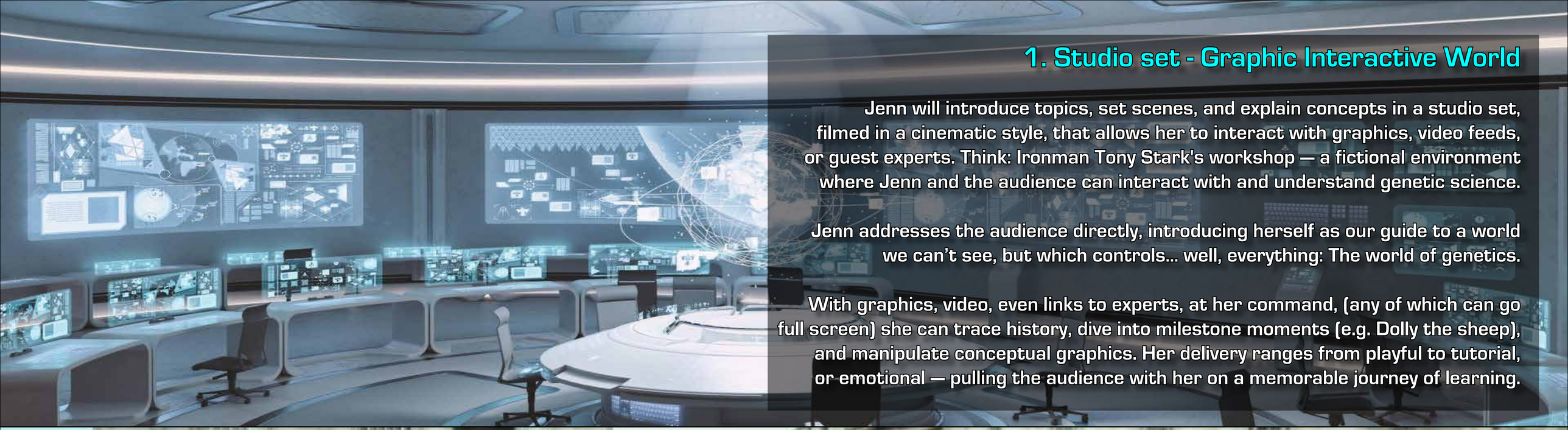
Step through the door. With Jenn. **Dr Jenn Gardy** takes our hand to entertain and educate us in a myriad of ways.

STYLE

Five complimentary styles will build a stand-out, cohesive, content-rich structure.

Host Driven Narratives...

Jenn will be on-screen in three different ways throughout the series. The concepts and narratives she introduces can be threaded through a story, an act, an episode, or across the series.



1. Studio set - Graphic Interactive World

Jenn will introduce topics, set scenes, and explain concepts in a studio set, filmed in a cinematic style, that allows her to interact with graphics, video feeds, or guest experts. Think: Ironman Tony Stark's workshop — a fictional environment where Jenn and the audience can interact with and understand genetic science.

Jenn addresses the audience directly, introducing herself as our guide to a world we can't see, but which controls... well, everything: The world of genetics.

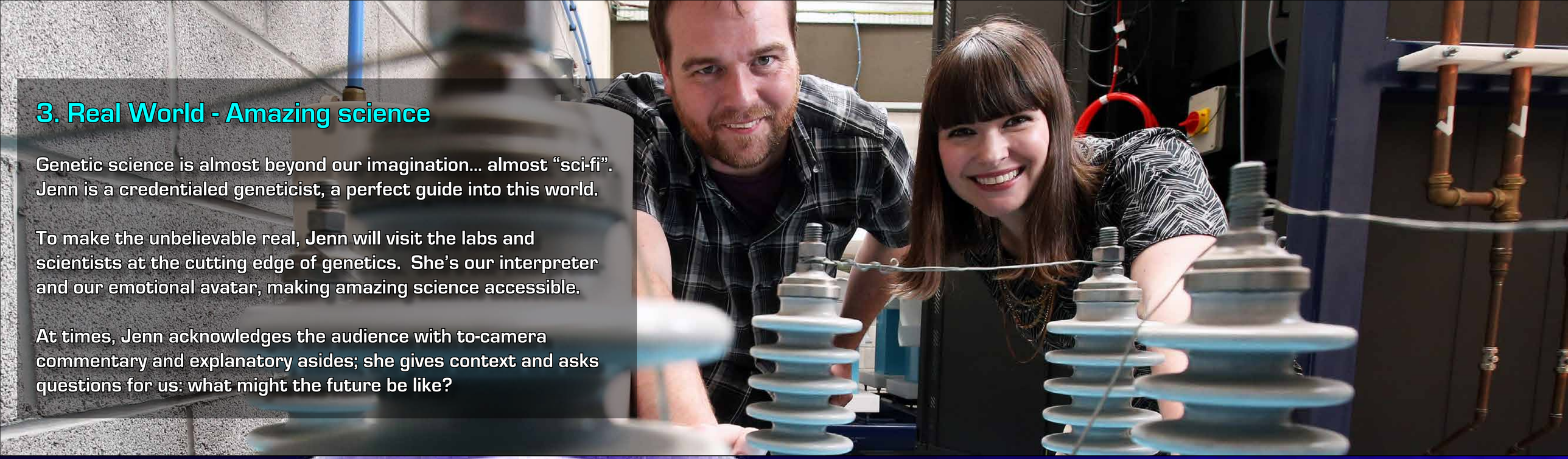
With graphics, video, even links to experts, at her command, (any of which can go full screen) she can trace history, dive into milestone moments (e.g. Dolly the sheep), and manipulate conceptual graphics. Her delivery ranges from playful to tutorial, or emotional — pulling the audience with her on a memorable journey of learning.

2. Real World - People

Filmed in documentary style, Jenn will visit real people to personalize genetic stories for the audience.

We join Jenn in motion, always dressed in action clothes — one possibility: all black, with black boots. Jenn narrates to set up the sequence, bridge scenes, and fill in key concepts... but it is her interaction with people, doctors and scientists that drives the emotional and informational arc of each story. These stories will have a sense of urgency... of seeking answers.

Each story is a journey of discovery, with inherent points we can break away from and return to later in the episode or the series.



3. Real World - Amazing science

Genetic science is almost beyond our imagination... almost “sci-fi”. Jenn is a credentialed geneticist, a perfect guide into this world.

To make the unbelievable real, Jenn will visit the labs and scientists at the cutting edge of genetics. She’s our interpreter and our emotional avatar, making amazing science accessible.

At times, Jenn acknowledges the audience with to-camera commentary and explanatory asides; she gives context and asks questions for us: what might the future be like?

Dramatic Narratives...

Drama captivates. Be it dramatising a real-life event or complete fiction, audiences love to be told a story, to suspend disbelief, and to be engaged. Genetics is complex and intangible to most people; drama lets us set the stakes, raise questions and present future possibilities — both good and bad.

Character development and archetypal story structures guide the audience, help them suspend disbelief, and give us the framework to present concepts... and even surprises.

4. Fiction

On one hand, the word “genetics” conjures images of rogue scientists, altered humans, evil villains..... and super heroes to fight them.

On the other hand, imagine stories of regular people facing extraordinary challenges, and doctors and scientists as real-life detectives and heroes.

Imaginative, multi-part dramatic stories let us explore the fact and fiction of a topic — addressing head-on the prejudices, assumptions and realities of genetics.

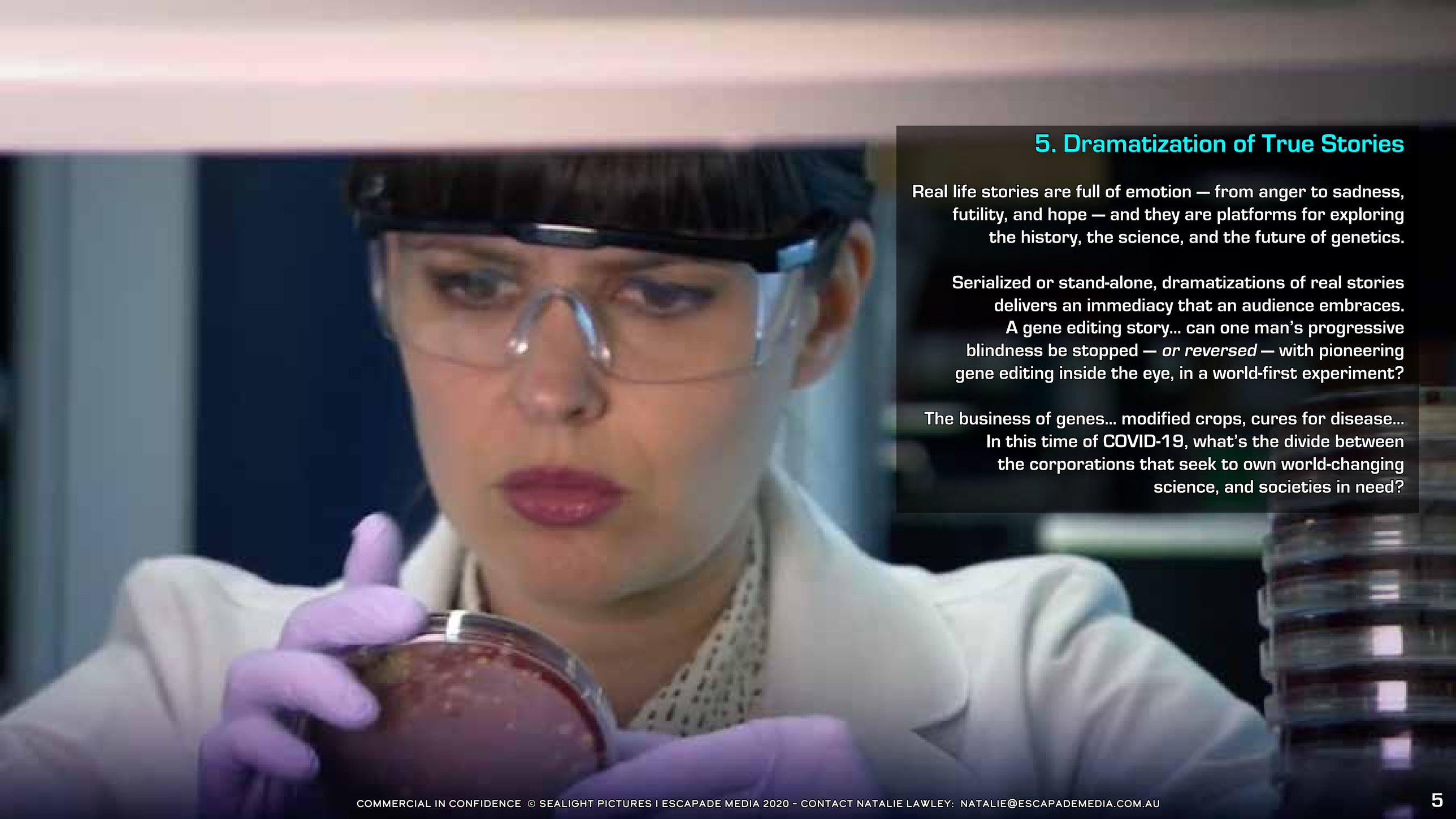
Regardless of the theme, these fictional stories are ultimately about people and how genetics influences their lives, and the world — couched in entertaining and engaging characters.

A superhero story... can explore the myths and realities of what gene editing means to us. Dead Pool, Captain America... is it possible?

A medical cure story... can ground us in the realities of genetics gone wrong and the life-changing possibilities of modern medicine.

A nature overturned story... could GM crops run amok?
And can a brilliant-but-outcast scientist find the answer to save everything?

A corporate espionage story... the oil extracted from a genetically modified plant is set to turn the world upside down — replacing petroleum. Its genetic code is beyond value... and someone is out to steal it. But can you own a hybrid plant?



5. Dramatization of True Stories

Real life stories are full of emotion — from anger to sadness, futility, and hope — and they are platforms for exploring the history, the science, and the future of genetics.

Serialized or stand-alone, dramatizations of real stories delivers an immediacy that an audience embraces. A gene editing story... can one man's progressive blindness be stopped — *or reversed* — with pioneering gene editing inside the eye, in a world-first experiment?

The business of genes... modified crops, cures for disease... In this time of COVID-19, what's the divide between the corporations that seek to own world-changing science, and societies in need?

EXAMPLES

The following examples are intended to convey the look and feel of these various narrative styles.

Episode 1 – Ready or not: The genetic revolution is here...

Jenn in Style 1, Studio Set: Interactive graphic interface.

This example addresses the physical structure and make-up of genetic material, connecting graphically illustrated chromosomes and the real world.

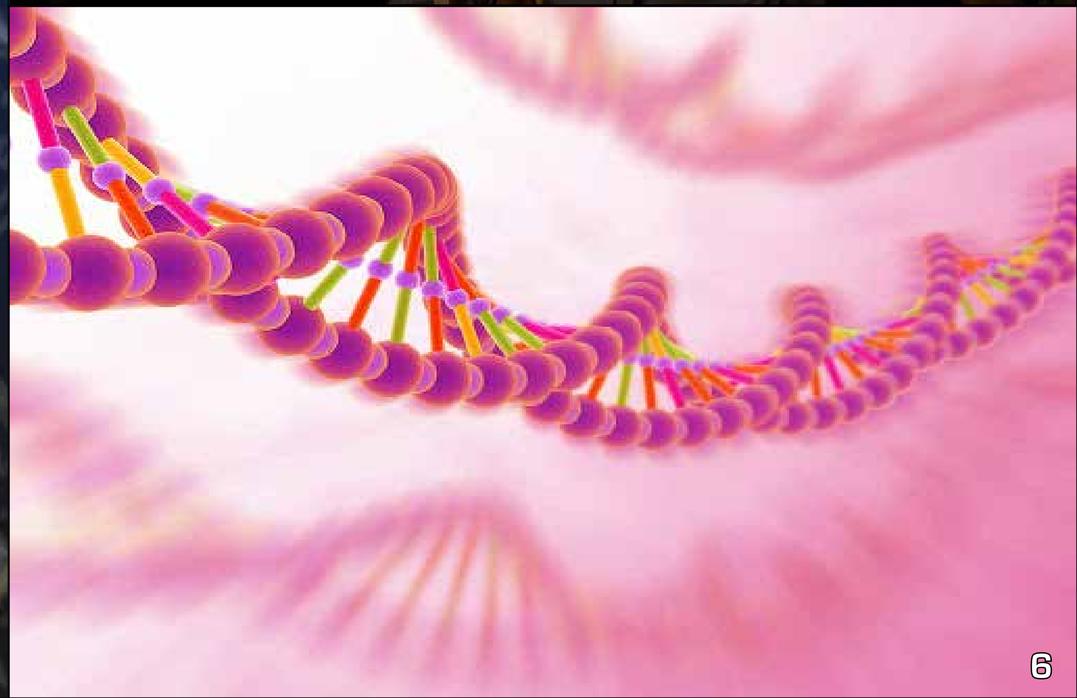
Jenn sits on a high-back stool in a high tech, low light set. Almost surrounding her, are 3D projected images... *"Computer, show me what chromosomes are"*. Different imaginings of the double helix, sets of chromosomes, and coloured balls representing chemical compounds appear.

Some images are archival, some recent; the discovery of the double helix, black and white photos of scientists, etc. She flips through them with a swipe of her hand, grabbing a new image from one place, moving another over to make room for it... this may be how a modern lab will look.

Jenn speaks to us as if we're visiting her; conversational, engaged. *"Double helix... Genes... chromosomes... the blueprints of life... genetic code... instructions... We've heard all of this before, but it just doesn't connect."*

"What does it mean? For some people it means everything". Jenn brings up more images of people of every ilk. *"But we do know that genetics plays a huge role in our lives. In many ways, it defines who we are"*. More images appear. (We can consider having some of these images being short video clips of some iconic people with genetic variations, from the giant in *"Princess Bride"* to Michael Jordan, from Peter Dinklage in *"Game of Thrones"* — just short clips). *"So, our genes can make us healthy, or famous. But if they're broken, life can be very difficult."*

Jenn tosses the images aside and brings up images of the double helix and a representation of a gene. *"We now understand genes more than at any time in human history. Even though they are tiny, microscopic bits that we can't even see... we can change them to treat disease or grow better crops.*
Heady stuff. To understand it, we have to go back to the basics of what genetic material is."



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"We always see genes represented like this: the double helix. I mean, how do we know that chromosomes are shaped like that – hundreds of meters of chemical thread jammed into something not even a fifth the width of a human hair. I mean, come on, how we do know. Well, that's what I'm going to show you."

Jenn, "grabs" the images in front of her and "tosses" them aside. *"Computer, show me an onion. This simple vegetable has a genome 5 times larger than ours. How is that possible? The human body is far more complex than an onion — though I suppose you could say we have 'layers', too. But the onion will make 'genes' real... something you can see and touch. And you can do this at home".*

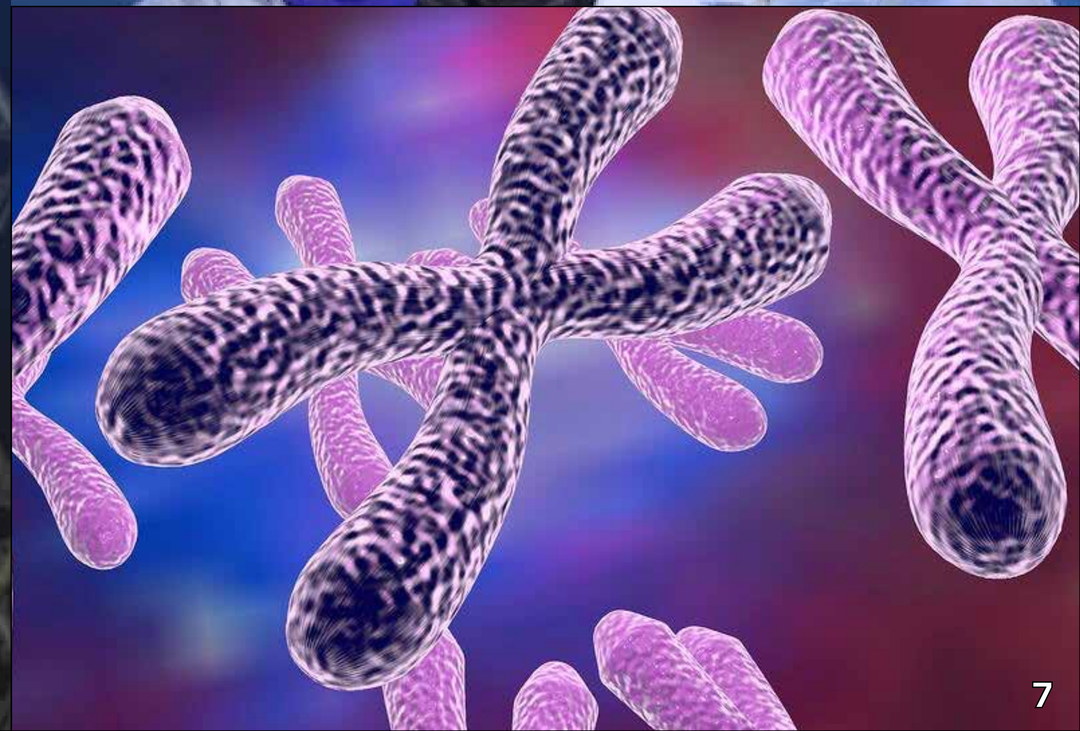
Step by step, Jenn shows us a simple process... with something tangible that we can all relate to – boiling an onion, adding some simple chemicals... and "voilà", we can see chromosomes.

Jenn pinches the air as if grabbing a thread from the pot, and raises her hand... *"This is a chromosome. It's a string of chemicals..."*

She 'tosses' the string into another screen, and pinches out to expand the image. Jenn takes us deeper to reveal what chromosomes look like. *"It's a bit messy, which is why we use these simplified representations* (she gestures and a graphic representation superimposes on the onion chromosome) *but that's what chromosomes are... a complex string of chemical compounds".*

"So, if that's a chromosome, what's a gene? Now you have to look deeper."... Jenn uses more interactive images (both Electron Scanning Micrographs and graphic representations) to reveal what genes are: compounds called DNA... chemicals strung together in a particular order.

Then, through graphics, she explains what those genes do: trigger the manufacture of specific proteins. *"And those proteins make you who you are. The DNA in your genes tells the cells that make your hair, "go red". And all the other attributes that make you, you."*



Episode 2 - Nature and Nurture... Genes plus other influences

Style 5. Fiction: Space Travel – past, present and future all in one.

In this segment, we use a fictional approach to address the concept of environment changing genetic expression.

We return to this fictional story throughout the series to illustrate different themes. As fiction, we can add jeopardy, emotion, and other constructs to engage the audience. In this example, the fictional story segues to the real world, looking at the medical history of long-term space flight, and genetic approaches to 'condition' the human body.

INT. Space ship. Any time. A small futuristic cabin, with narrow bunk and built in desk.

A woman is unpacking a few items from a small bag. She's in her mid-30s, physically fit, but clearly not an astronaut — it's her first time in space and her curiosity is obvious. She wears a standard issue jump suit with a name-patch that says Ryan.

She peers out the window, then takes a manuscript out of her bag and puts it on the desk; it's a scientific manuscript with the title *"Agri-forming Mars: Advanced CRISPR technology"*, with her name and title.

Now we know this is Sue Ryan, Scientific Adviser, and her job is to make Mars habitable.
(This scene should be ground-laying to give this woman a purpose when we return to this fictional story. Agriculture is just an example.)

Sue checks her watch and sits down at the desk in front of a futuristic camera on a flexible stalk. She positions it to aim at her. Clicking a button, a red light goes on, and see her as if through the device. She begins to speak, self-consciously at first.

PRECISION CRISPR

NEXT GENERATION GENOME EDITING APPLICATIONS

"They told me I should make a video blog. That it would be helpful for me to record what's happening, so I remember later. I'm not much on being on camera, but here goes. It's the 11th of May, and I made it to the Space Station this morning. They assigned me a berth on the Voyager heading to Mars next week." She gestures awkwardly,

"This is it. Home, I guess. There was the usual long orientation meeting. I think all 10 of us newbies were ready to fall asleep. But there's lots of time for that. They said it would take 9 months. They could go faster, but they need to save fuel for when we're there, and getting home. To keep us from going nuts, we get to sleep. 9 months, zero-G. A lot can happen to your body in that time, they said. Changes to your bone density, your musculature; something about your genes responding to conditions."

Sue looks at the time on screen and reaches toward the computer. *"I gotta get fitted into my deep sleep bed."* She taps a button, and the image cuts to black.

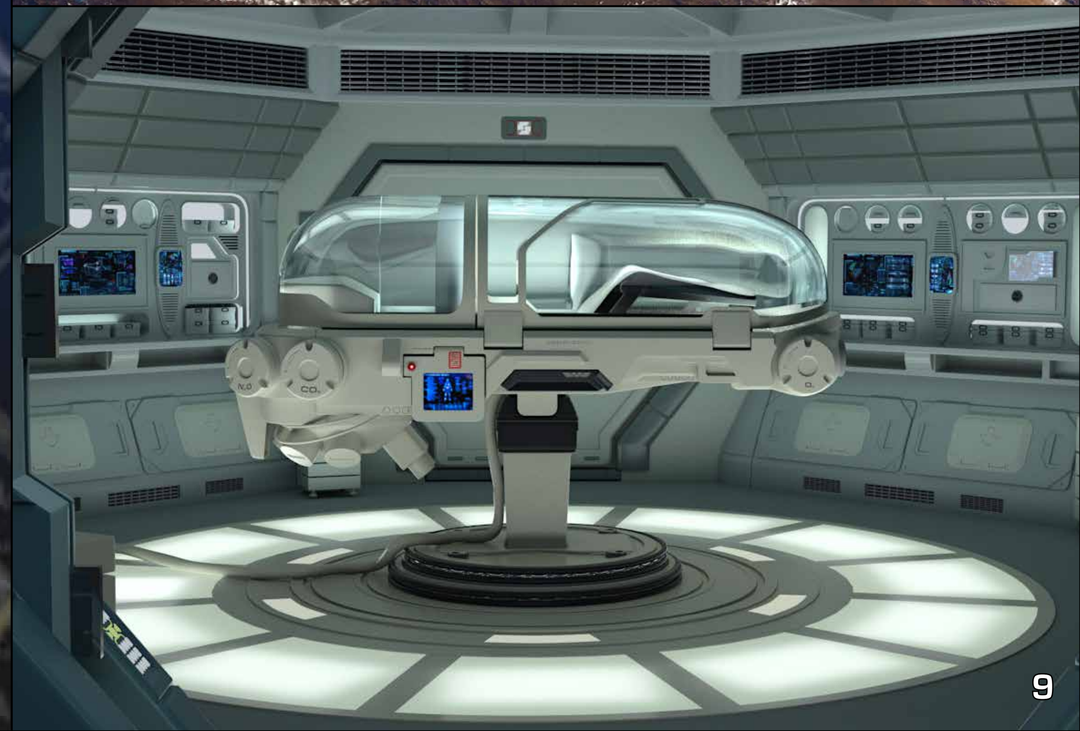
Sue is inside a metal tube, lying in form fitting cushioning. She watches technicians at a body scanning display. Holding a remote control device, one tech makes an adjustment, glances at the display, then asks her, *"How does that feel?"*. Sue nods, *"Fine, I guess."*

Her voice is tinny on the comms system. "*OK*", the tech says, *"Now, we're going to run some genetic tests to customize your sleep parameters. It'll take a while, so watch this... it'll give you some background info."*

He taps a button and a HUD (heads up display) image appears in front of her; it's a rocket blasting off. The camera pulls back revealing a long line of sleep beds.

Segue to: Style 3. Real World - Amazing Science... Space Travel – past, present and future all in one.

The HUD image goes full screen; the take off continues, then shots of the Int'l Space Station.
A narrator's voice intones, "*Long term space travel began in earnest in the 1990s.*"



We hear about the first long-term space flights for humans, and the record lengths of stays on the Mir and ISS. Then, we see images of those astronauts' post-flight, and Jenn's voiceover begins...

"A lot of things happen to the human body in long-term space travel. Changes to how our bodies function; things that don't seem to make sense just from a lack of gravity."

Venturing into the environment of space can have negative effects on the human body. Significant adverse effects of long-term weightlessness include muscle atrophy and deterioration of the skeleton (spaceflight osteo-penia).

Other significant effects include a slowing of cardiovascular system functions, decreased production of red blood cells, balance disorders, eyesight disorders and changes in the immune system.

Additional symptoms include fluid redistribution (causing the "moon-face" appearance typical in pictures of astronauts experiencing weightlessness), loss of body mass, nasal congestion, sleep disturbance, and excess flatulence.

This segment includes archival footage and Jenn's interviews with astronauts, scientists, and pioneers like Elon Musk and Peggy Whitson to reveal what can happen to the human body in space and delve into how our genes respond to an altered environment.

We'll use graphics to help explain those changes, and examples from nature of epigenetic changes (changed characteristics of an animal species in different environments, e.g., coat and build of dingoes in alpine vs dessert).

Combating the effects of long-term space travel will be necessary if humans are to live and work in space.

Episode 3: Genetic Medicine... Fluid genomes, and Heredity

Style 2. Real World - People:

In this example of real-world story, Jenn Gardy explores how genetic medicine is like detective work... with clues that sometimes lead in surprising directions. As this story unfolds, we break away to Jenn in her workshop, where she provides deeper background to help us understand the story. Then, we return to the story.

INT. Airport:

Jenn exits the skyway amidst disembarking passengers. She's dressed in black. CUT to: Jenn exits the airport and hails a cab. Inside the cab, she takes a folder out of her bag, and begins to examine the papers.

In narration, she says, *"What does it mean to be human? To be subject to forces of natural selection... to random mutations in our genetic material that changes... everything."* Street signs flash by, the taxi crosses a bridge... a sense of time and anticipation.

"In the past, mutations could be a death sentence. Now, we have the knowledge and technology to change that. Sometimes. And that knowledge can be a double-edged sword."

The taxi pulls up outside a hospital....

"We can replace those random mutations with man-made ones. We can change the outcome. Sometimes, in unexpected ways."

In hospital, Jenn meets Dr Emma Palmer, a geneticist (placeholder name). She tells Jenn that they will be meeting a mother and her son, Adrian, a child who is far too small for his 7-years of age. Dr Palmer explains that Adrian was referred to her by the boy's paediatrician.

Adrian had always been a bit small, but a few months ago, his growth seemed to stop. In the time we would expect a boy to grow 7cm, he grew only by 1. This could indicate a genetic problem – a mutation.

Jenn asks, *"How common are mutations that could be expressed in a lack of growth?"*
Dr Palmer, *"We don't really know. But mutations happen all the time."*

Here, we break away, back to Jenn in Style 1: Studio Set... Mutations:

She says, "*Think about this. Every time a cell divides, its DNA has to be copied. Two sets of 3 billion pieces of information, crammed into a tiny space. Mistakes happen all the time. And you have around 30 trillion cells in your body. A recent study shows that there are between 1 and 3 mistakes for every cell division..."*

"That is a lot of mistakes and the result is that your genome isn't really one genome that defines you, because every hour, every minute, your genome has changed a bit. In reality you have trillions of slightly different versions of your genome at any one time..."

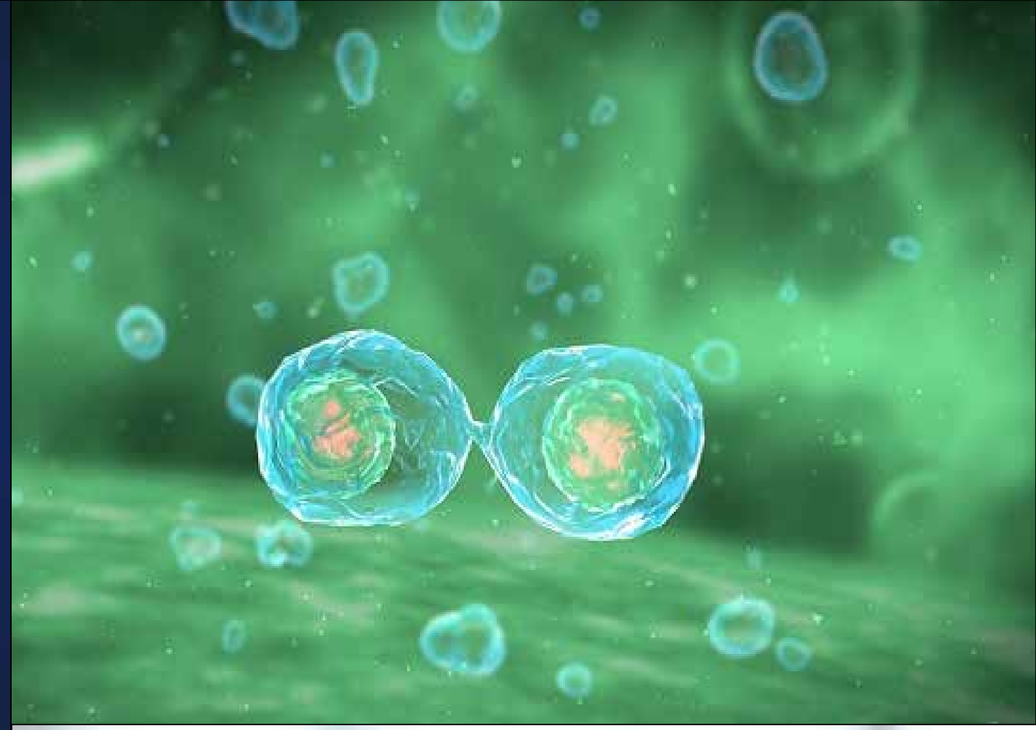
"But our bodies are good at working around these random mistakes. It takes a combination of errors in exactly the right order to change our health. So, is that what happened to Adrian?"

We return to Jenn and the story of Adrian and his mother. *Style 2. Real World - People*

Back at the hospital... Jenn and Dr Palmer greet Adrian's mother. It's time to give her news, both good... and disturbing. Dr Palmer explains that she did what she always does: interviewed Adrian's mum, and gleaned everything she could about the boy's life history. Nothing jumped out at her, at first.

But then Dr Palmer shows the boy's mother Adrian's growth chart from his doctor's records, and reveals something remarkable: Adrian, always short for his age, apparently experienced a huge growth spurt a year ago.

It was the recent measurement, compared to that, that raised alarm bells. Dr Palmer's detective work revealed that the growth spurt was really a mismeasurement. Adrian was tracking just fine, albeit a bit short for his age. It earns a relieved laugh from everyone.

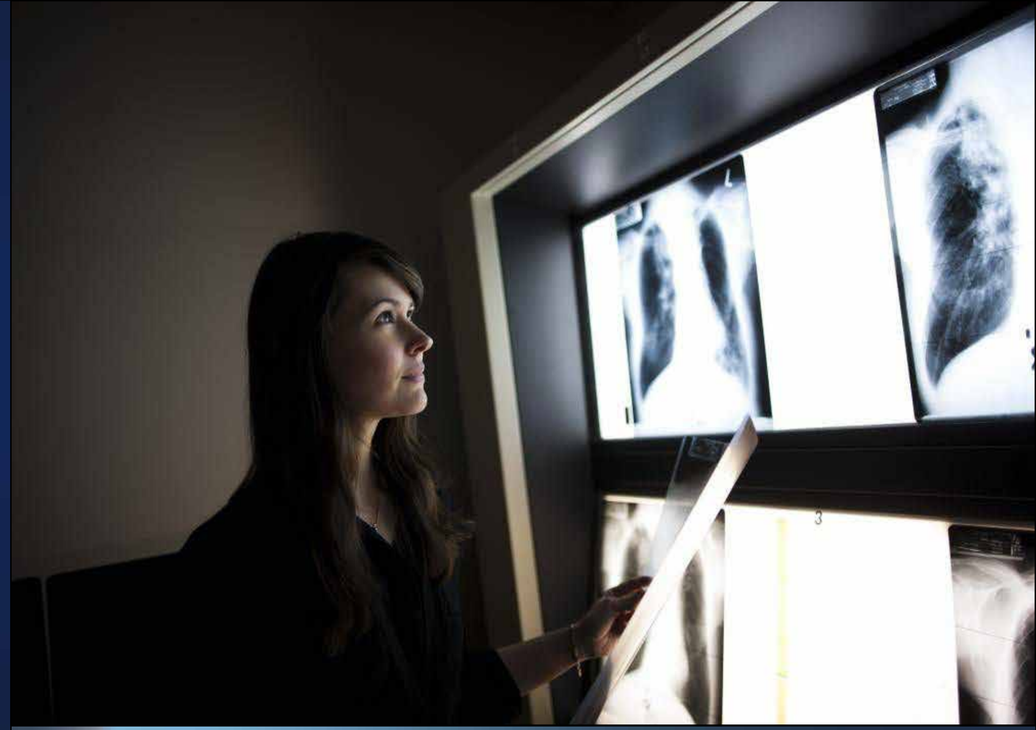


But then, Dr Palmer reveals something else. *"When I asked you about family history, you told me that your first cousin was recently diagnosed with breast cancer. And that two other family members died of breast cancer at an early age, and another who had died of ovarian cancer. That's why I asked you to get tested for the BRCA1 mutation."*

Adrian's mother's face reflects the fear she is feeling. Only partly mitigated by what Dr Palmer tells her next. *"You've tested positive for the BRCA1 mutation."* Dr Palmer and Jenn go on to explain the positives...

Back in her interactive graphic lab...Style 1. Studio Set, Jenn reflects on the experience as an image of that meeting plays in front of her.

"This is both bad news and good. It's never easy to learn you are at high risk for cancer. But "knowledge is power", and this knowledge will let Adrian's mum take charge of her future. She can be screened more frequently, and manage her health choices. Early detection means a greater chance of a cure."



EPISODE BREAKDOWN

Ep 1 – Ready or not: The genetic revolution is here

Ep 2 – Nature and Nurture: Genes plus other influences

Ep 3 – Genetic medicine: Fluid genomes, and Heredity; Intervening to fix what's broken

Ep 4 – Man-made nature: You name it — genetic manipulating for brains, brawn and beauty alike

Ep 5 – Owning Life: Biotech and Big Business

Ep 6 – This Way Forward: Harnessing our Post-Natural world

SEE DR JENN GARDY:

HTTPS://VIMEO.COM/255775388
HTTPS://WWW.YOUTUBE.COM/WATCH?V=NL_CX91SXYC

SCIENTIFIC CONTRIBUTORS:

- DR EDWIN KIRK, AUTHOR, PROFESSOR, AND PRACTICING GENETICIST
- BRONWYN TERRILL, THE GARVAN INSTITUTE OF MEDICAL RESEARCH

The Producers:

The principals of SeaLight Pictures have been making high-rating, award-winning factual content, such as *Can We Save the Reef?*, *Shark Eden* and *Inside 9/11*, for decades, creating entertaining, respected series for the likes of National Geographic, PBS, Discovery, BBC, NHK, Arte France and Germany, Disney, CCTV China, and others.

They are currently co-producing the next Sir David Attenborough series for Netflix and the BBC. In 2018, SeaLight's Adam Geiger won Australia's highest award for science journalism and communication, The Eureka Prize.

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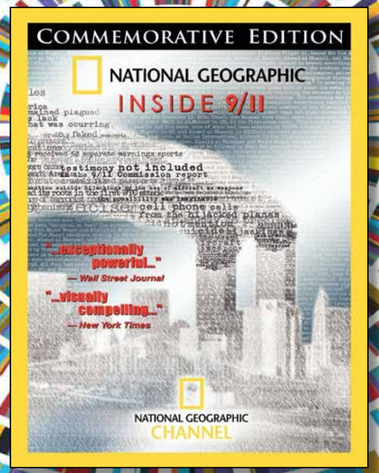
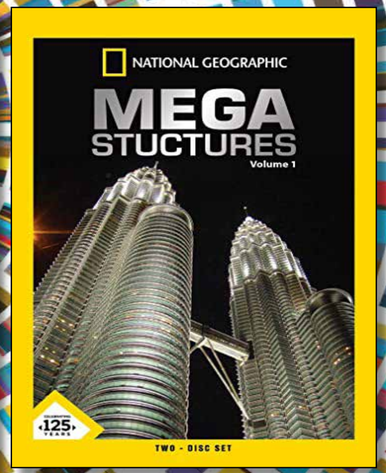
In addition to distribution of content made for BBC, PBS, ABC and others, Escapade is working with such content creators as Intuitive Content, Insight Productions, MediaStockade and SeaLight Pictures.





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