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Bones in the Sand

By Liz Fyne

Lilly had brain cancer. She would die, soon, after forgetting, losing, drooling. Her one option: get infected with HIV.

She sat in the doctor's office, staring at the dark spot on her scan that had been identified as a tumor. She touched the scan with her fingers, trying to feel the spot. It looked like a hole, an imploded star. She thought it should feel like nothing. She expected her fingers to slip through the darkness to the other side. When they instead just slid off the edge of the scan, she thought perhaps reality had already departed.

"Of course you're not really being infected with HIV," said Dr. Tim. His name was Dr. Tim Strand, but she called him Dr. Tim. "It's just the HIV backbone, with other genes inserted. Genes that target destruction of your tumor."

The HIV backbone, or the minimal HIV gene component in a circular piece of DNA designed to facilitate gene insertion, was famous. It was something too tiny to be visible to the human eye. Lilly pictured it as a cow's vertebral column half buried in the desert sand. All the flesh etched out from wind.

Years ago, when the research community gave up on efforts to eradicate HIV virus from the body, a small minority had advocated an alternate strategy: just add more. Put its efficiency at gene delivery to good use.

There'd been ethical issues, the idea was ridiculed, until it was determined that HIV conveyed resistance to the new virus, VIKI.

Lilly was twenty-three when VIKI had first appeared, eighteen years earlier. At the time she lived with her younger sister, Ella, in a rat trap apartment just off campus. Friday nights before going out they'd eat pizza and watch TV.

It was summer and it was hot. Every summer, it seemed hotter. Scientists reported the global temperature was rising too fast.

One night the news said some people were sick. They got fever, aches. Then vomiting. Sweating. Dead in twenty-four hours. Not in the US, though. Just in England.

"Is that possible?" asked Ella. "You can die from the flu in twenty-four hours?"

"It's not the flu," said Lilly. "They said there was no recognizable flu virus."

"Maybe they're exaggerating," said Ella. "Maybe those people died in twenty-four days."

Lilly gripped the sofa and turned a worried eye on her sister. Ella was so easily sickened. But England, that's far away. And Ella was right, journalists loved the hyperbole.

But it turned out Ella was wrong. The disease was fast. Also, it spread, jumping the pond from England to everywhere else. Stores closed. Restaurants shuttered. People slunk outside wearing face masks. Lilly and Ella huddled inside their apartment, only venturing outdoors to restock their hoard of non-perishable groceries.

One day Lilly noticed that Ella seemed fascinated with her hand. She curled it into a fist, then opened it wide.

Ella's palms were wet. Her fingers seemed stiff. Her skin had a sickly sheen.

She glanced up and caught Lilly's eyes.

They looked at each other.

They knew the hospitals were full. Anecdotal evidence said the hospital could help. Empirical evidence said it didn't. Either way, it didn't matter. These days only important people or rich people had access to medical treatment.

Without meaning to, Lilly glanced at her watch: 10:30am. Tomorrow by noon, Ella could be—

"We can play cards," said Lilly. "Do you want to play cards?"

"Should I leave?" asked Ella. "In case I have it?"

Lilly imagined her sister dying in the street like roadkill. It wasn't a possibility she could consider.

"If I'm going to get it from you, I probably got it already."

She retrieved the cards and added a second deck so each game would be prolonged. She dealt for War, a game that required nominal mental contribution and seemed endless even with just the standard deck.

Words unsaid passed between them—not everyone died. Some people, not many, made a full recovery. Some people never seemed to get infected in the first place.

They flipped cards in succession.

Double threes.

Seconds passed and no one spoke.

"War," said Ella, finally.

More cards. Lilly won and scored the booty, but she wished she'd lost. She developed a superstitious fear that if she won more games than Ella, it meant Ella would die.

When Lilly had all the cards they started a new game.

Ella's hands trembled. "I'm not really shaking," she said.

They played again and Lilly wished she were a card shark. She knew there were ways to stack the deck, to feed the good cards to Ella and the bad ones to herself. She thought back to all the years she'd spent learning useless skills, like how to solve for *x*, while she'd neglected something as essential as letting her sister win at cards so she wouldn't die of The Sweat.

Which she did, the following morning at 11am. Lilly rushed from the apartment, from the smell of sickness. She hid in an alley and sobbed.

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It was The Sweat, an obscure and largely forgotten illness, that was exhumed from the tombs of history. In the time and country of King Henry VII, The Sweat arrived in the summers, then ravaged the populace, thinning villages to nothing. It had appeared from nowhere. Some years later, it withdrew once more into the realm of stories related by grandmothers to their incredulous progeny.

Contemporary scientists theorized The Sweat was related to hantavirus, a new strain of which infected people in the Four Corners region of the United States in the early nineteen nineties. VIKI, bearing notable sequence similarity to hantavirus, was thought to be yet another new form of hanta, transformed and incubated through the mouse vector. Increased temperatures world-wide spiked the mouse population. People were infected by aerosolized mouse droppings. Then a new viral species arose in which infection occurred directly from person-to-person.

Then men were widowed. Children were orphaned. Like Lilly, they stood at headstones, memorials, handmade wooden crosses planted in the flower bed.

In the aftermath of her sister's death, Lilly got a book on cards and games. She filled her empty days learning to deal, count and shuffle. She practiced endlessly until cards passed her fingers with a lightness that resembled suspension.

She braved the outside world and found employment as a croupier in one of the new gambling houses. The business had swelled to prey on sickly masses grasping for financial windfall and access to dubious medical interventions. She spent hours at bright, velvet-covered tables bathed in the endless daytime of casino life. By manipulating the deck she decided who would win and who would lose. In her mind, those who won were saved in a way she'd been unable to save her sister.

Between work shifts she drank stale coffee and watched the news. There were daily roundtables on the epidemic. A blond man, wearing what was once a nice suit, had been a surgeon. Now he mostly worked on VIKI.

"People who have HIV infection come to the hospital," he said. "They're scared they have VIKI, but so far not one of them has been infected with VIKI. They're just sick because their HIV meds are running out and they're relapsing."

"So now they'll just die from the HIV," said the moderator.

"But other people with HIV infection *do* still get their meds. They're not sick from HIV, they just have a regular flu, but they also don't have VIKI. My point is this: Even if your HIV infection isn't making you sick, it still confers resistance to VIKI. We can use a treatable infection to block an untreatable infection. We can test it in monkeys."

Lilly, who still hadn't been sick, wondered if maybe she'd been exposed to HIV. But she'd been tested, not long before the VIKI outbreak, when she'd donated blood.

Soon the same doctor was back on TV.

"We tested monkeys prophylactically infected with different versions of the simian HIV virus. Even monkeys just infected with the HIV viral backbone and one other gene have remained resistant. So far."

"Where did you get the monkeys?" asked the moderator.

The doctor blinked, looked sheepish.

"Some were from pre-existing facilities. Some we got from the zoo."

He admitted it was a dirty experiment, but the implications were profound.

Three days later, he died. He'd been bitten through the gloves by an angry, VIKI-infected monkey.

The surgeon's sudden death just drove the frenzy of his results. Now everyone was talking about the nebulous Backbone, so small and spiny. Day after day Lilly dealt hearts and diamonds and pictured a white skeleton in yellow sand. Maybe something by Georgia O'Keeffe.

It was called it The Backbone, because no one wanted to call it HIV.

Other doctors, other "experts" occupied the soundstage and argued how best to proceed.

"Mass Backbone infection could save millions."

"It's a messy, poorly tested hypothesis."

"How many people will die while we argue?"

"How many people will die if we make the wrong decision? What will be the repercussions for mankind as a whole?"

"What will be the repercussions if the whole goddamn human race goes extinct?"

"Some people haven't been infected no matter what. We've survived other pandemics."

One of the speakers punched the moderator. The camera seemed to tip and then the screen filled with snow.

Lilly killed the TV and returned to work.

Such arguments dwindled as the experts died. The soundstage operators died.

Then flyers appeared in hallways, bathrooms. Everywhere in the city. Call this number and get directions for access to the vaccine. Lilly heard people whisper in toilet stalls. *Did you try it? Did it work?*

"How could you tell if it worked?"

"I got it and I haven't gotten VIKI."

"You didn't have VIKI before."

"They said it was tested. They said the tests were *molecular*."

A few remaining newscasts covered emergence of the new black market vaccine. Three macaque monkeys were found at the home of a former zookeeper. They were confiscated and injected with the vaccine, then with VIKI. They didn't get VIKI.

"They were injected with a vaccine made from human HIV," cautioned a man on the news. "And it was only three monkeys."

But three monkeys were enough. Suddenly people who'd resisted consumption of GMO meats and crops, long-standing vaccines for polio and measles, flocked in hushed crowds to be infected with an experimental serum whose results would embed itself in their genome. Mark them forever.

To advertise vaccination status, it became *the mode* to get a tattoo of a vertebral column that circled the wrist of your right hand.

One day as Lilly dealt spades and clubs she noticed that everyone at her table had a tattoo. She noticed as players stole glances to her own wrist, so pale and naked and white.

"How are you?" asked one man, a total stranger, as she passed him a card.

"I'm fine, thank you."

"You know, people who don't get The Backbone pose a risk to society."

"They said you can only infect other people with VIKI if you're sick. I've never been sick."

"You could *get* sick," said the man. He smiled at her, one incisor rotted black. "It's the right thing to do. It's patriotic."

Lilly was startled. "It's patriotic?"

"I'm just saying. It's better. Safer. For everyone."

She dealt him out and he left the table. He was the only person to say something. All the same, she thought she'd start wearing long sleeves when she left her apartment.

Back home, that evening, Lilly stared at the empty space on her sofa once occupied by her sister. When she closed her eyes Ella's death came back to her. The long night. Watching the clock. Time paradoxically racing and dragging. She'd felt torn between fast and slow until she thought she would die, also.

She weighed her options. It was true, theoretically, that The Backbone was not the same as being infected with HIV. But she worried, what if those genes somehow *did* become HIV? She had no real understanding of the process. No understanding if such a thing were possible. What she did understand was that the vaccine would become a permanent part of her DNA. And that it was barely tested, crudely prepared. Maybe cooked on the stove. Did they cook vaccines on the stove? In a dirty pot?

She had an image she'd seen in movies: boiling heroin in a spoon and then pulling it into a syringe. Filthy and disgusting.

She thought again of the skeleton in the desert, this time charred and blackened.

There'd been stories of people who got the vaccine and died, days later, not of VIKI but of sepsis. Other people got The Backbone and also got hepatitis.

But those who survived and got no other diseases did well. When Lilly watched TV, for the first time, new infections of VIKI were down.

Every day, fewer people dying of VIKI. Celebrations in the street.

Weeks passed. More good news.

Another story: Two men who didn't have tattoos were found beaten to death. Signs were hung from their necks: *Be Safe.*

Lilly stuffed a wad of cash into her purse and visited a small tattoo parlor. She paid an exorbitant price but received a tattoo even though she didn't have a certificate of vaccination.

There were reports on TV.

News anchor 1: "The pharmaceutical giant Gene Sciences is in talks with one of the underground vaccine facilities to buy the vaccine and institute mass production."

News anchor 2: "The FDA is in talks with Gene Sciences."

News anchor 1: "Congress wants to fast-track the deal."

Elections were held because so many members of Congress had died and then their replacements had died after taking office. Newly elected members were fresh from the trauma of losing loved ones within a single day of horror and tears. For so long people had lived in relative safety from disease. Plagues were something from long ago, depicted in Medieval paintings of skeletons dancing with peasants. But now the threat was real and imminent.

A vaccine based on the underground version was FDA approved in record time. A mandatory immunization program was implemented similar to the smallpox program from decades ago, largely forgotten. Door-to-door. At home. At work.

Lilly hid. She skipped work and stayed at hotels. While sitting in dark rooms, she wondered if she was being unreasonable. The new vaccine wasn't cooked in a spoon over a flame. It had been optimized and verified. But she'd never been sick. Everything was happening so fast.

At a speed that amazed her, life was rewound. The stock market was up. Life skipped and then found its track.

At a café she met a young man, Arthur, who asked her to dinner. It shocked her how desperately she wanted to go, how much emotional hunger she'd accumulated since losing her sister, watching the world go to pieces like something from a big budget Hollywood blockbuster movie.

Paying the tattoo artist her life's savings so she wouldn't be beaten and have a sign hung from her neck.

After dinner, in Arthur's bed, rather than making love she found all she could do was cry.

"I had a sister," she told him.

"I had a brother," he said. "I had a friend."

"I had a life. A happy life."

"You can have a happy life again."

She saw him the next day. Once more on the weekend.

"I became a croupier," she said, "to save other people from dying. It was the stupidest thing."

He stroked her cheek.

Arthur had been a post-doc at Gene Sciences when VIKI hit. He'd received his PhD in molecular virology. Unlike Lilly, he'd followed all the science. He'd never had to make due with bones in the sand.

He'd been vaccinated early on, by a person he knew and trusted.

"Is it safe?" she asked.

"Now it is."

It was more than safe, he said, it was the beginning of a new era. The public at large was freshly receptive to the marvels of genetic manipulation.

What from others might be a sales pitch for stockholders, was real hope in Arthur's earnest dark eyes. She felt oddly secure in his company, somehow insulated from the vagueness of all her previous terrors. Because he understood, she thought she didn't have to. It was a burden she hadn't even known she had until it was lifted.

She watched as Arthur and others milked public sentiment to push through new avenues of research that would previously have been considered too controversial. She thought back to GMO, the old protests. Fights over gene therapy and stem cells. People had been reluctant to infiltrate their bodies with foreign DNA. More than reluctant, actually.

"The HIV vector can be used to deliver good versions of bad genes," Arthur told her.

"But is it safe?" she asked.

"It's more complicated than just giving The Backbone, but soon gene delivery will be safe, too."

"It seems strange to me."

"Love, it's fantastic."

The devil, that's what some people called it. Unnatural. A violation of your body and privacy.

But those people were in the minority.

Lilly didn't believe in the devil, but still she felt wrong. The solace she took from Arthur's companionship was disingenuous. After all, her own Backbone status was a lie. She and Arthur began to fight. In a fit of anger she left him. Once more alone, she watched TV at work, drank stale coffee.

The news featured a report on people who continued to resist Backbone vaccination. They were given a reasonable time to comply; if they didn't comply they were jailed. Then prosecuted. Jailed again, this time indefinitely until such time that they complied.

"It's my right not to be vaccinated," one person said.

The reporter: "Public sentiment is in favor of Backbone vaccination and emerging forms of gene therapy."

Suddenly Lilly knew: She would go to law school.

She got her degree and joined a small practice that provided pro bono representation to Backbone resistors. She rose to become senior partner and fought her battles in a realm that continued to occupy the fringe elements of society. Now she also occupied a soundstage on TV.

"There was a time," she said, "when no one was subjected to involuntary genetic manipulation."

"The Backbone vaccine has produced no long-term ill effects."

"It's the principle," said Lilly. "And what about all these new gene therapies? Are they really safe? Ethically defensible? Because of fear, people have voluntarily ceded control of their genetic material. But does that it make it right?'

Lilly's life, her litigation and writings, brought her a new measure of peace when one day, strangely, she opened her mouth but couldn't speak. The episode lasted for only a few seconds, then it passed. But two weeks later, it happened again.

She had a headache that didn't go away. She developed a persistent twitch in her left arm.

She was passed from doctor to doctor, scan to scan. Finally, she met with Dr. Tim. He showed her the dark outline of a tumor on her MRI.

"This is a very aggressive form of cancer," he said. "You need to start treatment immediately."

Lilly sat in an upholstered chair and watched the doctor from across his desk. Her eyes wandered to the diplomas on the wall. Then to a photo of him standing with what she assumed was a famous athlete. She didn't reply.

"What did you pay for that tattoo?" he asked.

Lilly looked back to Dr. Tim.

"I know you were never vaccinated. It came up on the tests."

Lilly said nothing.

The doctor sighed.

"You survived the VIKI pandemic and you were never infected. That came up on the tests, also. If you'd had it and fought it off, you would have the antibodies.

"You got an illegal tattoo and lived a lie and then took up the cause of resistance. All this time you've kept yourself alive and free of both VIKI and the relics of HIV. You've been through so much, I understand that. But now you have brain cancer. We have a gene-delivery therapy that's 80% effective."

Lilly studied a scratch on her left hand. Then her arm twitched, causing her hand to jump.

"The twitching will get worse," said Dr. Tim. "Much worse."

"I'm scared," said Lilly.

"The treatment is good. Chances are you will make a full recovery. I won't tell the authorities you were never vaccinated."

"It will go against everything I've done."

"In what sense? I've seen you on TV. You oppose forced vaccination."

"Fear has made people malleable to genetic manipulation, even for something like this."

"Is that so bad? You have still your cause, and it's still legitimate." He paused. "Look, Lilly, if you don't get this treatment you will die, in a year. Possibly less. Have you fought and survived so long just to die when new technologies can save you?"

Suddenly Lilly was unsure. What was her platform, exactly?

Would she succumb? Not to forced Backbone, but to this new trend? The new era as predicted by Arthur?

She felt paralyzed, not from the tumor, but from indecision. The terror she'd lived during the epidemic, all the fear she'd pushed back in her mind, it resurfaced now stronger than ever and threatened to swallow her whole.

She'd thought it was gone, but really it just hibernated. Faced once more with death, she crumpled.

She left the hospital and found a café. She thought back to her own words.

When people are scared, they become more malleable.

There was a time, when no one was subjected to involuntary genetic manipulation.

But in this case, she was not being forced. The mass immunization program had passed her by, and with luck and ingenuity she'd remained free of both VIKI and HIV.

HIV: a disease that had killed millions.

It's not really HIV.

It could come back. The Backbone would stay with her forever.

But no one had been sickened by The Backbone. It was a true miracle of medical technology.

She went to the counter to get a refill on her coffee.

"I'd like—"

Her tongue turned to stone and she felt off balance,

"Are you OK?" asked the barista.

"More coffee," said Lilly, as her tongue came back to life.

In her apartment she sat alone and huddled in her bed. The degree of terror surprised her. Her need to make it go away surprised her, too. Despite her ongoing health, she'd been petrified throughout the VIKI pandemic, thinking that at any time her luck would run out. If she felt too hot, too cold. If she sneezed.

Horror. Staring at her reflection in the mirror, looking for signs of illness.

Nightmares of watching Ella die.

But the doctor was right. She'd survived. She had her cause. She was only forty-one.

She'd survived but she hadn't really lived. Now she needed to live.

She called Dr. Tim.

"I need to make an appointment."

Liz Fyne has an M.S. in neuroscience and she spent over fourteen years doing biomedical research, including six years working in a translational HIV cure lab. She has two short stories published in anthologies (2015, 2017). A third story was published in 34th Parallel Magazine (2016). She is also author on multiple scientific publications and a peer-reviewed book chapter.
