Super Genius DNA #Chapter 51: A-Bio (6) - Read Super Genius DNA Chapter 51: A-Bio (6)

Chapter 51: A-Bio (6)

This was the neuropsychiatry department at Yeonyee University Hospital. There were about a dozen elderly people lying in the hospital beds in the room. This was the new institution that was in charge of the powerful clinical study of the stem cell based Alzheimer's treatment. It was all over the news everywhere when they heard that a clinical study was being conducted, but it got quiet after a month. It was because none of the patients showed signs of improvement.

Shin Jung-Ju, the primary doctor in charge of the clinical trial, came in.

"How are you feeling?" She asked Park Joo-Nam.

She didn't reply.

As Shin Jung-Ju was examining her by asking her a few more questions, Young-Joon approached her from the back.

Young-Joon chose Yeonyee Hospital as the next institution because Professor Koh In-Guk recommended it. Now, instead of receiving report documents, he came to the hospital in-person and checked the progress once every week. He felt a little sorry for the primary doctor, but he couldn't stop worrying if he didn't do this. Although, it was a relief that Professor Shin Jung-Ju didn't mind Young-Joon visiting him. It was because Shin Jung-Ju was friends with Koh In-Guk and had heard about everything that had happened.

"I think we will have to monitor them and see how it goes," Shin Jung-Ju said to Young-Joon.

"Yes, of course. It will take some time for the newly differentiated nerve cells to establish themselves. A month might not be enough," Young-Joon replied.

As Shin Jung-Ju was examining them, Young-Joon also examined them using Synchronization Mode. To be honest, this was more accurate than a doctor's examination.

Although it didn't seem like it on the outside, the treatment was just about to work. It was usually like this most of the time for stem cell therapy type

biological agents. The changes didn’t show up on the outside, like an incubation period, but it had a time of perseverance where things were being done under the surface. After a certain point, the treatment effect will rise exponentially.

“Oh, you’re here, Doctor.”

Someone suddenly came out from behind and greeted Young-Joon. It was Kang Hyuk-Soo. They saw each other quite often, but he always reacted this way whenever Young-Joon came.

Kang Hyuk-Soo didn’t make it obvious, but to be honest, he knew that the money that was in his mailbox was from Young-Joon. That was why he came to him and respectfully greeted him out of gratitude and happiness, but Young-Joon found it a little too much.

‘I purposely came here at a time he wouldn’t be here...’

Young-Joon already felt tired, but he still greeted him brightly.

“Hello.”

“Doctor, would you like some chocolate?”

Kang Hyuk-Soo handed him a chocolate bar.

“I'm fine. But shouldn’t you be driving your taxi right now?”

“I come here five or six times a day to see my dear.”

Kang Hyuk-Soo smiled warmly.

“That grandpa is such a devoted husband,” An elderly woman who was near the window said in a playful voice. She had early-stage Alzheimer’s and was the most lucid out of all the patients here.

“It would be nice if my husband was like that.”

Kang Hyuk-Soo scratched his head with an embarrassed look on his face and handed Young-Joon a chocolate bar again.

“It’s because this is all I have to give you, Doctor. Please eat this and work hard!”

“Thank you, but I’m fine. Let’s give it to the doctor.”

Young-Joon gave the chocolate bar to Shin Jung-Ju.

“I’m a little ashamed to receive this since we haven’t made any progress on the patients yet,” Shin Jung-Ju said with a chuckle.

“Haha, they will get better soon,” Kang Hyuk-Soo said as his wrinkly eyes blinked.

“Isn’t that right, dear?” He asked as he turned to face Park Joo-Nam. She slowly raised her head.

As she did, Young-Joon flinched a little. It was because a message window popped up when they met eyes.

[Synchronization Mode: Would you like to analyze synaptogenesis? Fitness consumption rate: 0.1/second] magic

Synaptogenesis: it was when new synapses formed. It meant that the developed neurons were connected to each other.

‘Then there should be a sign...’

“Shave,” Park Joo-Nam said to Kang Hyuk-Soo.

There was a moment of silence. He was frozen and unable to move.

Park Joo-Nam stared at him, and said in a low voice, “You should shave.”

“What... did you...”

Shin Jung-Ju stood in front of Kang Hyuk-Soo, whose eyes widened in shock.

“Ma’am, can you recognize him?”

“...”

Park Joo-Nam slowly nodded. It was very slow, but she had gotten her memories and cognitive abilities back. It was proof that the battle between Alzheimer’s and stem cell therapy, which happened in the patients’ brains over the past month, had come to an end.

* * *

As time passed, the fully developed neurons began to establish themselves one by one in all the patients. Once they entered recovery, they progressed quickly. In just four days after Park Joo-Nam brought up shaving, none of the patients had incontinence anymore. After a week, patients who had a hard time moving could move on their own, although they were slow. In the second week, the patients' cognitive ability and problem solving abilities returned to similar levels before suffering from Alzheimer's.

"Ma'am, we're going to subtract seven from one hundred in our heads," Shin Jung-Ju said.

"One hundred, ninety-three... eighty-six? And um... Seventy-nine?"

"That's correct. Can you do more?"

"Seventy-two! And let's see... If I take three away from ten, and it's five if I add two... Sixty-five?"

Shin Jung-Ju got goosebumps on her arms. Before treatment, they couldn't even subtract one from one hundred. Now, their problem solving abilities might be better than the average elderly person.

There were still no signs of side effects, such as the stem cells causing tumors in the brain. From the MRI data, she could clearly see that the atrophied cerebral cortex and hippocampus had been normalized. The ventricles that had expanded had shrunk and returned to normal.

She still had to observe them, but she knew that she could cautiously make a conclusion as a doctor.

"I cannot say that they have fully recovered, but I can say that they have improved significantly," Shin Jung-Ju said.

Jessie, the editor of *Science* who got her medical opinion from her, felt like her heart was beating so fast that it was going to shoot out of her chest.

"Tha...nk you so much..."

Jessie's voice trembled.

In terms of what kind of impact this would have, it was on a whole other level compared to a glaucoma cure.

Phase one of a stem cell therapy clinical trial aiming to cure Alzheimer's had succeeded: apart from this turning the academic community and hospitals upside down, what kind of effect would this have on society overall?

Before this, there were a lot of drugs developed to treat Alzheimer's. Some of them aimed to completely cure it, while others used stem cells. Places like AllBio, Naturegenic, and Trinity Clinic Fukuoka conducted a lot of research like that. Furthermore, a lot of them went into clinical trials as well. A bunch would come up if she searched for stem cell therapy for Alzheimer's on Google.

The problem was that they all failed. There were a lot of new and existing pharmaceutical companies who jumped into this field in high spirits and ready for the challenge, but they all failed because it was too hard.

So, the only four products that were approved by the FDA in America were Namenda, Aricept, Exelon, and Razadyne. And all they did was ease the symptoms or slow the progression of Alzheimer's. A drug that had the potential to regenerate damaged brain cells and cure them did not exist, until now.

There were around eighty million patients who suffered from Alzheimer's around the world. The number rose so steeply that some predicted the number would be around 2.7 million in 2050.

'A future like that won't come if this technology is commercialized.'

Young-Joon was rescuing the person's life and quality of life, but if the financial and emotional costs, which arose due to the nature of the disease, it had on society were also considered? This was something that was worth more than receiving the Nobel Prize ten times over.

"Are you also going to interview Doctor Ryu?" Shin Jung-Ju asked.

"Yes, of course."

"But you might not be able to interview him because he's extremely busy."

"Really?"

“It’s just something I heard, but he is expanding his business, writing the Alzheimer’s paper and he’s also preparing another clinical trial for another new drug. I heard that he doesn’t get more than four hours of sleep every day.”

“Woah...”

“But I think he will publish his paper soon. I think this will definitely be on *Science.*”

“No matter what kind of papers are released this month, this one’s going on the cover no matter what.”

“I’m excited, too. I get to have my name on a *Science* paper thanks to Doctor Ryu.”

Shin Jung-Ju smiled.

* * *

“Kill... me...”

Lee Hae-Won had finished registering patents for all one hundred twenty-two drugs for thirty-four different diseases. Even if she grouped a few drugs together for one disease, she was still writing thirty-four different patents.

‘I swear I would have died from overworking if I had two more.’

She flopped over on her office desk.

But all one hundred twenty-two drugs had good experimental data. All the data that Cell Bio sent her showed that all the experiments succeeded.

‘How is this possible?’

Usually, the process of developing a new drug involved putting thousands of drug candidates into one disease model cell line at once and then selecting one that had an effect. It meant that there was a one in a thousand or ten thousand chance of discovering a new drug.

But Young-Joon couldn’t have tested hundreds of thousands of candidate materials alone.

‘How did he know that these candidates had effects?

To put it a little harshly, it felt like someone’s delusions all turned out to be correct. After picking out one hundred twenty-two candidates like they were already existing drugs, he conducted the necessary experiments to make data, then patented them? Everything went according to plan, like a conveyor belt running, but it truly was astonishing.

There were a lot of things about Young-Joon on the news lately, but this was more fascinating to Lee Hae-Won than iPSCs or a glaucoma cure. He was more than a genius.

‘Does he have an alien trapped in his basement or something?’

As Lee Hae-Won was making up a fantasy...

Click.

She heard the door open. As she stood up slightly to see the door, she could see Park Joo-Hyuk walking in.

“Heya.”

“I thought you were a customer.”

Lee Hae-Won chuckled and sat back down like she wasn’t excited anymore. But she stopped mid-way in a weird position.

“Wait...”

She suddenly felt anxiety in her heart.

With a trembling voice, she asked, “H-Hey, um... Doctor Ryu didn’t give you anything more, right?”

“Hehehe. You cannot escape from work, you slave. I’ll tie you to your chair right now because you shouldn’t even think about leaving.”

Lee Hae-Won went pale.

“Please let me sleep eight hours a day.”

“But even if you work that much, you don’t want to lose our CEO, right?”

“Of course. If I lose him, I won’t have a job.”

Lee Hae-Won poured a glass of orange juice and gave it to Park Joo-Hyuk.

“So, what’s up?”

“I actually didn’t come here to give you work. Tricked you, right?”

“What?”

“I’m here to scout you,” Park Joo-Hyuk said.

“Scout me?”

“What do you think about working as the in-house patent attorney?”

“At A-Bio?”

“My CEO says that he has quite a few things he wants to assign you. He’ll make sure your salary is much higher than what you’re earning right now.”

“...”

“Why do you look like that? You don’t like it?”

“I like that I’ll be paid a lot, but I think the amount of work I have will be several times more than what I have now if I become an in-house...”

“I heard about a few items and his business direction when we had lunch together. I assume it will be a dozen times more.”

“Holy...”

“Don’t worry. You won’t be doing them alone. We’re going to make a company legal team, and we’re going to have a few people who specialize in patents. And if you come to work here, your work-life balance will be better.”

“It will become better?”

“Our company complies with the fifty-two-hour workweek limit. And everyone gets off work on the dot.”

“Really?” Lee Hae-Won was shocked.

“But it’s still a start-up... How does that work?”

“Well, all the base experiments are done in the CEO’s head..”

“I’ll go right away. Where’s the contract? I want to sign it right now,” Lee Hae-Won said quickly, not wanting to lose this opportunity.

“Good. The first thing you’ll probably be doing once you come will be transferring the probiotics product. He commissioned that to you, right?”

“Yeah. I’m discussing it with the Patent Law Office at Lab Six and working on it.”

“Good. Take care of that when you start working. You’re going to have to work alone for a while. You could discuss it with the CEO, but you’ll probably have to do it by Skype.”

“By Skype? Why?”

“He’s going on a business trip to the U.S.”

“The U.S.?”

‘Is he getting an investment in the U.S.?’

Lee Hae-Won tilted her head in confusion.

“He said that he’s going to the International Integrative Brain Disorder Conference. He’s going to present the results from using stem cells to treat Alzheimer’s in the clinical trial to get some funding.”

Chapter 52: A-Bio (7)

Song Ji-Hyun, who worked at Celligener, was on the first floor of A-Bio. Thinking about it now, it was like a dream that Young-Joon treated her dog, Brownie, and they had a drink together in return. It felt like a guy she knew from the neighborhood who was good at dancing debuted and became Michael Jackson in just a few weeks. Song Ji-Hyun just thought of him as a unique and talented scientist, but one day, his paper and interview were published in Science. And then, he became super famous in a few months by appearing everywhere on the news, and now, he was the CEO of a company named A-Bio.

‘I have a personal connection with someone like that?’

No matter how Song Ji-Hyun thought about it, she couldn’t believe it. She had Young-Joon’s number on her phone, but she didn’t have the courage to call him even out of curiosity. So, instead of calling him and asking him for directions, she was wandering on the first floor of A-Bio alone. She couldn’t find the elevator.

“Hello.”

Choi Myung-Joon and Seo Yoon-Ju, who ran into her by chance, greeted her.

“Hello,” Song Ji-Hyuk replied.

“I haven’t seen you around. Are you Doctor Song Ji-Hyun?” Choi Myung-Joon asked.

“Yes, I am.”

“Nice to meet you. I’m Choi Myung-Joon. I am responsible for probiotics at A-Bio.”

“Nice to meet you.”

They shook hands.

“Let’s head over to the conference room.”

There was a probiotics meeting scheduled today. It was to share their results and check the direction of the progress. Song Ji-Hyun attended the meeting as Celligener’s representative.

The three of them went to the conference room on the second floor together. Inside, Young-Joon was waiting for them. With the beam projector on, he was putting out beverages and chocolate and setting up for the meeting.

“Ack! Sir, I will do it!”

Choi Myung-Joon ran toward him in shock and took the snacks away from him.

“Oh, it’s fine... Haha, thank you.”

“Sir, why don’t you hire a secretary? You can get your employees to do this...”

“I’ll consider it when the company gets bigger. I have no problem managing my schedule by myself right now.”

Young-Joon walked over to the front of the computer.

“Doctor Song, did you send the files for the meeting by email?”

“Yes.”

“The wireless connection in the conference room isn’t good, so I'll download it to a USB from my office. Wait here.”

“Here. I brought it on a USB as well just in case.”

Song Ji-Hyun handed him a USB.

“Thank you.”

As Young-Joon was plugged in the USB and opening the file, Song Ji-Hyun, who was watching him, talked to him.

“Double-coating the capsule worked.”

“Really? That’s good.”

“It worked when we did it according to what you told us, Doctor Ryu... I mean, sir.”

“Just call me Doctor Ryu.”

“...”

“Oh right, Doctor Song,” Young-Joon called.

“Yes?”

“There are two things I want to work with Celligener on.”

“Two?”

“One of them is developing a coating technology for a pancreatic cancer treatment. I’ll provide a sketch of the basic concept of it. Celliener should be able to do it quickly since you have a lot of experience with developing capsule coating technologies and you have a lot of equipment. I can’t give you royalties, but I will provide compensation for it.”

“Thank you. I’ll talk to the CEO about it. What’s the other one?”

Young-Joon grinned.

“What do you think it is?”

“...”

Song Ji-Hyuk tilted her head with a puzzled look on her face.

“What is it?”

“It’s the development of Cellicure, an early liver cancer treatment.”

Song Ji-Hyun’s eyes widened slowly.

“Cellicure?”

“I brought it with me when A-Bio left A-Gen. Let’s work on it again.”

Song Ji-Hyun asked again as if she couldn’t believe it.

“You brought Cellicure with you?” magic

“Yes.”

“Doesn’t Lab One of A-Gen have it?”

“A-Bio got the development and patent rights of Cellicure. We’re going to continue it from phase two of clinical trials.”

“...”

“This is the right thing to do. A more advanced drug shouldn’t disappear like that. If you want, we can let Celligener participate in the development process. And we will provide compensation as well. What do you think?”

“We would absolutely want to do it if you let us. It was the first drug we developed, so it means a lot to us.”

“Good. We’ll set up a meeting with your CEO next time.”

“We’re ready, sir!” Choi Myung-Joon said after putting up the slide about the progress of the development of probiotics on the screen.

“Thank you. I only have an hour for the meeting since I have to head to Incheon Airport right away to go to a conference in America,” Young-Joon said as he sat down.

“You’re going to a conference?” Song Ji-Hyun asked.

“Yes.”

“Where?”

“The International Integrative Brain Disorder Conference.”

“I’m going to a conference in the U.S. in two days. It’s a different one, though.”

“The IUBMB?”

“How did you know?”

“That’s the most famous one among the ones that are happening now. I’m going there after my conference, too.”

IUBMB stood for the International Union of Biochemistry and Molecular Biology. The reason that Celligener was going to IUBMB was because they were a venture company. It was where promising new technologies were promoted, international investments were given, and where people were recruited. It was the best place for new investors, job seekers, and venture companies who needed to meet other companies they could work with. Although, Young-Joon had a different goal.

“Shall we begin?” Choi Myung-Joon said.

“Yes.”

“First of all, we bought the strain you told us, *Clorotonis limuvitus.* And we also modified the genes you directed us to do. We confirmed ATak711, YJ2, mCAL

by sequencing, overexpressed them by two hundred percent, and we also confirmed them by Western Blot.”

“I think I also asked you to check the expression level of Amuc and the vesicles. Did you do that by chance?”

Young-Joon didn’t tell anyone yet, but Amuc was a biomaterial secreted by bacteria that could cure type-2 diabetes. Vesicles were a small foamy membrane that the bacteria used to transport Amuc.

“It’s right here.”

Choi Myung-Joon went onto the next slide as if he was waiting for it. Pictures of the vesicles from *Clorotonis limuvitus* came up on the screen.

“This picture was taken by adding a fluorescent green tag to Amuc. As you can see, the vesicle is lighting up in green, meaning that Amuc is wrapped in the vesicle when it is secreted.”

Young-Joon smiled in satisfaction. Choi Myung-Joon went on.

“We used fluorescence flow cytometry and separated these vesicles into another tube. We purified it with FPLC and confirmed that it was Amuc.”

“Good work.”

“Sir, we did this because you ordered us to, but what does Amuc do?” Choi Myung-Joon asked.

He thought it would have some significant effect since Young-Joon was so obsessed with it, but he couldn’t predict what it would be.

“I guess I could tell you now since Attorney Lee Hae-Won and this project is confirmed to be A-Bio’s.”

Young-Joon went on.

“That material called Amuc is a cure for type-2 diabetes.”

Choi Myung-Joon almost dropped his laser pointer.

“This is... What? What is this?”

“Type-2 diabetes is a type of autoimmune disease. The Amuc protein will normalize the function of immune cells to suppress their response and decrease insulin resistance.”

“...”

“It will probably have therapeutic effects on diabetes even if we purify Amuc and inject it intravenously. But the best method is to establish *Clorotonis limuvitus* in the gut as the patients take probiotics. In my opinion, the most severe patients will also see results in four months at the most.”

“How did you figure this out?” Song Ji-Hyun asked like she couldn’t believe it.

“I got the idea while reading some papers.”

Choi Myung-Joon was a little confused.

“Then... Is this a drug? Or is it a health supplement?”

Usually, products that were made to prevent and treat diseases and had clear effects and side effects were usually called drugs. Products that had less of an effect but were safer due to less side effects were called health supplements; they didn’t target a specific disease and improved a large variety of functions in the body.

“It’s neither. It’s more effective than any diabetes treatment in the market right now, but it virtually has no side effects. It specifically targets diabetes, but it’s still probiotics, which improves a large variety of functions,” Young-Joon said.

Seo Yoon-Ju gulped.

‘So, he’s saying that this drug is out of this world...’

Choi Myung-Joon asked, “Then what are you going to create it as?”

“Let’s do both. Let’s put it out as a generic drug by purifying Amuc and as a health supplement by using live bacteria.”

“...”

“But I think it will be really hard to get approval from the MFDS.”[1]

Song Ji-Hyun added, “It’s not a GMO, but a LMO.”

GMOs were genetically modified organisms, but they were dead. For example, they were things like genetically modified corn powder.

However, LMO were living modified organisms. Not only were they heavily regulated, they had to start by obtaining approval for *Clorotonis*, a microorganism that wasn't recognized by the MFDS.

"Even if we prove its safety, the MFDS will be very conservative on this because they are going to be afraid of taking responsibility if something goes wrong unexpectedly.:

"It's alright. They will give us their approval."

"Really?"

"There are three hundred million type-2 diabetes patients in the world. They will not be able to make three hundred million people suffer in pain because they're scared and hesitant to give their approval when we've clearly shown its safety and efficacy," Young-Joon said. He added, "And someone who is internationally renowned in this field has joined us. Doctor Felicida will join us as the principal scientist."

"Alright."

"We're going to focus our company's resources on this project for quite a while. Let's take a look at the progress for the capsule coating technology."

"Sure."

Song Ji-Hyun opened her presentation files and reported their progress.

"... And so, we confirmed that the capsule coating safely transported the target material through the digestive organs into the gut through a mouse experiment done with the radiology team. We saw that the alginate hydrogel layered with chitosan had a positive effect as well."

Young-Joon nodded his head.

"Good. I think you should have a meeting with Doctor Felicida next. I think I will be a bit busy even after returning from America. I will leave the basic set-up of Amuc to you."

* * *

On Friday morning, a paper was published in *Science*. The name of the paper was [The Treatment of Alzheimer's Disease and Regeneration of the Brain Using Stem Cells.]

There were about fifteen authors: Young-Joon as the first and corresponding author, and Professor Shin Jung-Ju who conducted the clinical study as the second author. Other than them, scientists who participated in creating the stem cells and the doctors who took care of the patients were listed as authors in order of their contribution.

When someone clicked on the affiliation category, which showed where the author was affiliated with, Young-Joon's company came up. It had changed from [A-Gen] to [A-Gen, A-Bio.]

A summary of the paper, which was edited by the editor in chief, Samuel, himself, made the front page of *Science.*

[In this paper, we created small stem cells, eight micrometers in diameter, by suppressing the expression of the AKKT gene, and we sent it to the brain by attaching a caverlin ligand to pass the blood brain barrier. Afterwards, we treated it with 3K3A-APC to differentiate the stem cells into neurons and regenerated the brain. We found that the brain size, cognitive ability, and problem solving of all eight patients who received this treatment recovered to normal levels, and there were no signs of side effects for five weeks.]

Even if there was a huge paper published in *Science*, it usually didn't dominate the news on Naver. However, it differed by what kind of paper it was. For news like this, reporters who specialized in science had to release an article covering this paper. All of a sudden, it became huge.

[A-Bio conquers Alzheimer's.]

[A world with no Alzheimer's is approaching.]

[The age where no brain diseases exist.]

[Dementia cured with stem cells.]

In just about an hour, forty news articles had been released. There were also some ridiculous articles among the sports news gossip.

[Stem cells can improve learning in students?!]

[Erectile dysfunction is treatable with stem cells! Give confidence to slouched men... <Read more>]

[Ryu Young-Joon, CEO of A-Bio, dating scandal with an actor, Miss S.]

It was just clickbait with no actual content. The only thing those articles wanted to do was attract more views as A-Bio and Ryu Young-Joon were keywords that guaranteed clicks.

“Are they insane? Who is Miss S? They are literally saying anything.”

Park Joo-Hyuk felt bewildered as he read the articles in the morning.

And later, in A-Bio’s office, all the company phones were ringing at once. Around ten employees were answering the phone, looking like their soul had been sucked out of their body.

“As nothing has been agreed upon yet...”

“I will deliver it to the CEO...”

They were repeating the same thing over and over again, like parrots.

Offers for investments and meetings were pouring in.

1. MFDS is the Ministry of Food and Drug Safety. It is the FDA of Korea. ?

Chapter 53: A-Bio (8)

Young-Joon was someone who was born and raised in Korea. It meant that unlike other elite scientists, he hadn’t been overseas ever. He finished his bachelor’s, master’s and doctorate at Jungyoon University.

He went overseas a few times for conferences, but he didn’t stay that long. Even so, he couldn’t go to conferences in the U.S. or Europe because it was too expensive, as the lab he completed his doctorate in didn’t have a lot of money. They struggled to pay the students even after getting a one million dollar project from the government, so they couldn’t afford the flight to Europe or the U.S.

As such, Young-Joon’s experience overseas was only limited to Asia. He was one of the smartest people in humanity who had conquered glaucoma and

Alzheimer's, but he had never taken a flight that was more than ten hours long.

'I'm kind of nervous.'

A day before the paper was published in *Science*, Young-Joon, who had arrived at Incheon airport with his security team, was kind of frozen in nervousness. He had to fly for eleven hours with Delta America Airlines. Park Joo-Hyuk had booked him a first-class ticket, saying that he had to be comfortable when flying for long hours. Young-Joon always sat in economy with cheap airlines, but all of a sudden, he was flying first-class.

"Sir!"

A woman who looked to be in her thirties arrived with two airport employees. She approached him while dragging her carrier. She reached out to Young-Joon for a handshake as she took off her sunglasses and hung them in her shirt.

"Nice to meet you. My name's Alice, or Choi Yeon-Ah."

"Nice to meet you."

Young-Joon shook her hand.

Alice had a master's in biology, and her current job was as a simultaneous interpreter. She also translated English biology books into Korean. She also happened to be Lee Hae-Won's sunbae, which was why they were able to get in touch.

"I can only read and write in English since I've been in Korea my entire life."

Young-Joon chuckled like he was embarrassed.

Actually, Young-Joon's English was good enough for him to have a conversation with Jessie in English, like he did during the *Science* interview. He didn't have a problem with using English in everyday life, academic meetings, or conversations.

'But this meeting is a business meeting.'

Young-Joon thought that even the nuance of one word could have a big influence. As such, he hired a translator to be safe.

“No problem. I will help you,” Alice replied.

Young-Joon stared at the airport employees standing behind Alice.

“Hello, sir. We will escort you to the VIP check-in lounge,” the employees said.

Young-Joon had found out now that the airport took care of the pre-boarding processes if they were flying first-class. There was no need for him to line up; if he just sat in the lounge and sipped his drink, the airline completed everything, from checking in to checking in baggage, and helped him board the plane.

“You didn’t know?” Alice asked Young-Joon, who looked a little stunned in the VIP lounge, as if this was unexpected.

“Yes. I’ve only flown economy before. It’s cool, but also a little too much,” Young-Joon answered in embarrassment.

“The airport limousine sometimes comes to pick you up as well. They do everything for you, from the front of your house to the destination.”

“I see.”

Money really made things convenient.

“But you are a fascinating person. I’ve done international translating as well with some businessmen and high-ranking officials, but I’ve never seen anyone like you before, Doctor Ryu.”

“What do you mean?”

“You know everything about research, but nothing about things like this. Usually, people are the opposite.”

“... All a scientist needs to know is science.”

“That’s right. I said that because I like that about you. I heard about you from Park Joo-Hyuk, and you’re just like what he said.”

“What did he say?”

“He said that science is the only thing you know and that you’re smart, but an oddball and single-minded person.”

“Please tell him that I do not like being exposed.”

“There are probably people that are fans of you because of that, myself included.”

* * *

Soon, Young-Joon and his group boarded the plane. He was shocked by the large space, seat, bed, and bathroom that made it look like a hotel room, but he didn’t let it show.

As they were having dinner, which was provided by the plane, Alice asked, “Could I ask you about A-Bio? Normal people like me are really curious since you’re super famous, and A-Bio is really big right now.”

“Sure. I’ll tell you unless it’s a company secret. What do you want to know?” Young-Joon replied after taking a sip of wine.

“Is Alzheimer’s really curable with stem cell therapy?”

“I guess I can tell you since my paper will be on *Science* by the time we land.”

Young-Joon added, “The Alzheimer’s clinical trial already succeeded.”

“Really?”

Alice’s eyes widened.

“Yes. We’ll be able to commercialize it after we go through phases two and three with more patients, but it was successful in phase one.”

“Woah... What about the glaucoma treatment?”

“Phase two is already done, and we’re on phase three.”

“Then will the future you talked about during your interview come soon?”

“We still have a long way to go.”

“But you’ll get rich.”

“Haha, not yet. The fact that nothing has been commercialized yet means that we have no sales yet,” Young-Joon replied.

“Then is there no revenue model for the company yet?”

“We’re getting royalties from the iPSC technology. After the glaucoma clinical trial, a lot of medical schools and biotech companies are using that technology and trying new things.”

“I see.”

“But it’s really little. To get enough money to grow the company, products like the glaucoma or Alzheimer’s treatment have to be commercialized and used in hospitals.”

“When do you think that will happen?”

“At this rate, in a few months.”

“Also, I heard that you’re trying to get funding. What is that for?” Kim Chul-Kwon, the head of his security team, asked.

“There are two things I need in order to proceed. The funding is to arrange those two,” Young-Joon replied.

“What is it?” Alice asked.

“It’s a secret from here on.”

“Hmph.”

Young-Joon smiled.

‘Professional staff and a major hospital.’

It was going to be a very new type of treatment center.

Whether it was the glaucoma treatment or Alzheimer’s treatment, there was one problem when it was based on induced pluripotent stem cells: it was that it required the process to create stem cells for treatment.

Could doctors at the hospital do this? They were professionals, but cultivating cells was something entirely different. As such, A-Gen created the stem cells and sent them to the hospital when they were doing the clinical trials for glaucoma or Alzheimer’s. The reason he chose Sunyoo Hospital in the first place was because it was close to the lab, therefore making that process

more convenient. No matter how safe it was, the fact that there was a transportation process was a penalty for safety that could not be ignored.

As such, stem cells had to be developed on-site and used right away. That was why Young-Joon was going to make a hospital that specialized in regenerative treatment. Hospital technicians who specialized in cell biology would standby in the cell culture room and develop the patient's tissues into iPSCs as soon as they received it. Then, it could be delivered to the doctor right away to be administered to the patient and treat them. It was similar to how a radiological technician was hired by the hospital to work with doctors.

A hospital that specialized in the treatment of glaucoma and Alzheimer's, other neurological disorders, which would be developed in the future, and organ regenerative treatment. After that, it would be the pioneer to conquer all incurable diseases, starting with pancreatic cancer and type-2 diabetes.

If A-Bio paved the way, several other hospitals would follow. And to achieve this, Young-Joon needed a large number of technicians who could develop stem cells and doctors who could do things like bone marrow transplants. They would need to newly develop these people, but they also needed to invite talented people from all over the world.

This was why Young-Joon was going to the US.

"If you get funding, are you selling bonds? I don't know what it is, but I want to buy some if I can," Alice asked with a chuckle.

"Oh, it's not that kind of funding."

"Then what is it?"

"It's a sponsored crowdfund. We're going to create a foundation and raise funds from all over the world to fight incurable diseases."

At this rate, he would be able to make a specialized hospital from donations alone. If he was short in some areas, he could use government subsidies or his own money.

Young-Joon had seen corruption during the clinical study for Alzheimer's. If he could, he wanted to leave the foundation and the hospital as independent of capital as possible.

* * *

This year's International Integrative Brain Disorder Conference was held at Brown University. It was an Ivy League university located in the state of Rhode Island.

Originally, it wasn't a very popular conference. Usually, about a thousand scientists and doctors attended, and about twenty company booths opened.

But this year, almost three thousand people in the industry attended. The reason was Young-Joon. Speakers at the conference had to deliver their presentations to the people in charge of the conference in advance. It was because they had to make a schedule with the title of the talk and the speaker's name in advance so that the other scientists could choose the one they wanted to listen to.

As such, after Young-Joon sent the manuscript of his paper to *Science*, he also notified the association in charge of the conference of the presentation data when Samuel and Jessie were editing and fixing the format of his paper.

Simply put, it meant that the title of Young-Joon's talk already circulated in the conference, like a spoiler, even before the paper was published in *Science.*

[The Treatment of Alzheimer's Disease and Regeneration of the Brain Using Stem Cells]

This was the title, and the person delivering the talk was the star scientist who shook the world with his success in the glaucoma clinical trial. What did this mean? It probably meant that although the data hadn't been revealed yet, he succeeded in the clinical trial.

After the schedule for his talk was released, the number of attendees instantly skyrocketed. The organizers of the conference rushed to increase lecture rooms, rearranged chairs and desks, and modified restaurant reservations.

And finally, on the day of the conference, numerous speakers gathered on the first floor of the natural sciences building at Brown University. Professors of medicine from prestigious universities showed up continuously, and famous people from the Harvard Medical Center, the Alzheimer's Team at Salk Institute, and the GDFI Braincell Laboratory showed up all at once.

'Holy, what is this?'

Professor Behnach from Brown University was under great pressure as the head of this conference. It was rare to see such famous people gathered in one place at any conference, as everyone's schedules didn't match up very well.

'Is there some sort of medical social group that I don't know about? Did they rent a bus together and come?'

About three thousand people were registered for the conference, but there were way more people than that. It was because of the insane paper that was published in *Science* the day before. This reminded him about the line of tourists that was in front of the Forbidden City when he visited Beijing on vacation.

Professor Behnach wondered who all these people were, but when he looked closely, they weren't all scientists. There were excited reporters, businessmen thinking about how to connect this astonishing item with their business, students burning with passion and pride in science, and patient families who found a ray of hope in the dark. It was extremely rare for a conference to attract such a diverse population.

At last, the conference became so big that they needed guards to maintain control.

'This isn't a Justin Bieber concert or something, but guards have to come and control the crowd because so many regular people came to some boring conference?'

Professor Behnach had never seen this kind of thing in his thirty-five years of teaching. It felt like he was dreaming. This phenomenon itself was newsworthy. Reporters were capturing the situation and making articles about it in real-time.

Young-Joon's talk was at ten in the morning. After giving his talk for two hours, he was going to have a luncheon meeting with a few professors of medicine and professors from Brown.

Since it was half past nine, Young-Joon should be showing up, but he hadn't arrived at the conference yet.

* * *

At eight in the morning on the day of the conference, Security Head Kim Chul-Kwon called Young-Joon by the hotel phone.

—Are you ready to leave, sir?

“Yes. Should we get going? What about Alice?” magic

—She’s already down and waiting with us.

“I’ll be down right away.”

—I will go up and escort you down. Please wait inside.

“Alright.”

—But you have a visitor.

“A visitor?”

—They came without letting us know. Should we set up a meeting right now?

“It’s a little tight since we only have two hours left until the seminar. I don’t know.”

—But they seem important.

“Who are they?”

—... They came from the White House.

Kim Chul-Kwon’s voice trembled as he delivered the news.

While working as security, Kim Chul-Kwon had worked for rude, third-generation chaebols[1] and famous celebrities in East Asia. But that was it; those were the most famous or powerful people he had met. Young-Joon had suddenly become one of the most famous people in the world, but he didn’t expect someone from the White House to come see him as soon as he came to America.

“Who from the White House?”

—They are from the Office of Science and Technology Policy. The director himself is here to see you.

The Office of Science and Technology, the OSTP, had a great influence on science and technology in the United States. The director of this office was also the science advisor to the President, who consulted the President on policies regarding science and technology. Simply put, they were the key person who determined and oversaw the science and technology policies that came from the White House. The director, the chief executive, had come all the way here to see him.

“I’ll see him.”

Later, Kim Chul-Kwon, who had come to get Young-Joon, escorted him to a private meeting room inside the hotel.

“Haha. Hello sir...”

Alice greeted Young-Joon with a nervous face. The security team from K-Cops stood behind her, and there were five men in suits standing across from her.

The man with white hair stood up from the sofa.

“Hello.”

“Should I translate? He said hello,” Alice said.

“I know that much.”

Young-Joon shook hands with the man.

“Nice to meet you. I’m Young-Joon Ryu.”[2]

“Nice to meet you. I’m Director James Holdren from the Office of Science and Technology at the White House. I apologize for not letting you know in advance. We came right away after seeing the paper.”

“It’s alright. But I do not have a lot of time as I have to attend a conference soon. Can we get straight to it?” Young-Joon said while staring right at James.

Young-Joon didn’t seem intimidated or nervous when he had the leader of American science sitting right across from him.

‘Then why was he nervous when he got on the first-class flight?’

Feeling a little baffled, Alice started to focus on translating.

“Have a seat first.”

James let Young-Joon sit down beside Alice and went on.

“We had our eyes on you when you first published your paper on induced pluripotent stem cells and nerve cell differentiation in *Science*.”

“Thank you.”

“Since you say you don’t have time, I will get straight to the point,” James said. “Doctor Ryu, we will give you US citizenship. Come to the United States. The U.S. federal government will provide you with unimaginable funding and support.”

1. word referring to conglomerates owned by families and also to members of said families ?

2. Young-Joon is introducing himself in English, but speaks Korean later on, which is translated by Alice, his translator. ?

Chapter 54: A Next-Generation General Hospital (1)

“You’ll give me citizenship?” Young-Joon asked.

“Yes. Do you remember when you said you would cure all neurological disorders in your interview?”

“Of course.”

“Honestly, not a lot of scientists believed you then. Your iPSC technology was astonishing, but curing neurological disorders is something entirely different. The public may have cheered, but the majority of scientists just thought of it as something you blurted out in youthful passion.”

“I would think so.”

“But now that you released clinical trial data that shows your success in treating Alzheimer’s, a lot more people will take your interview more seriously,” James said. “To make your dream come true as soon as possible, you will have to collaborate with them. And the most effective way to do that is for you to move your research base to the U.S.”

"…"

"You probably already know this as you are an expert in this field, but the United States is an international hub of biology and medicine, which is acknowledged by the world. We have the most advanced technology, facilities, and human resources that no other country can match up to."

James smiled.

"One evidence of that is how your country pronounces genome, right? It used to be genom, but everyone says genome now." magic

Genome, or the entire set of DNA instructions in a cell, was first introduced as genom, which was the German way to say it.[1] It was pronounced like that up until the 2000's, but all the scientists in Korea were influenced by the overwhelming research and results produced from the Anglo-American region. Now, everyone in Korea pronounced it the American way.

"You know a lot about Korea," Young-Joon said.

"My son-in-law is Korean. That's why I am more fond of you."

James had done a lot of research on Young-Joon: what kind of person he was, and what kind of things he considered before choosing and acting.

"Doctor Ryu, it feels like God sent you here to advance medicine and science. It seems like that's the only thing you want."

"…"

"I heard that you do not compromise with power, nor do you seek money. The only thing you want is the advancement of science, the conquering of diseases, that's it. Is that right?" James asked. "Then is there any reason for you to not come to America? Put your patriotism aside for a little bit and think globally for the future of humanity. The U.S. has the most resources in biology, and I think we have a responsibility to support you."

"Thank you for saying that. There are no borders in science. I will do anything to accelerate my research as long as it does not break research ethics."

Alice and Kim Chul-Kwon looked at Young-Joon in surprise as he said that.

"Director, how can the federal government support me?" Young-Joon asked.

“First of all, transfer A-Bio to America. The federal government will lead and help the moving process. I heard that a significant number of key individuals at your company are foreigners who joined your company after seeing the job listing in *Science*. I don’t think they will leave because you’re moving the company here. And it will be less bothersome to do it now as your company is still new.”

“What about A-Gen? I am still the director.”

“It’s common for large multinational companies to have a foreign director or CEO. Even if you obtain American citizenship, it won’t be a problem for you to work at A-Gen. It’s just moving the location of A-Bio to America,” James replied.

He added, “And if A-Bio becomes a U.S. corporation, the federal government will set up a new office building for A-Bio in Silicon Valley. And we will provide you with three billion dollars of financial and material aid every year. How does that sound?”

‘Three billion dollars.’

It was definitely an extraordinary offer.

“But I think the Korean government would regulate it if we do something like that.”

“Of course. But if you want to, Doctor Ryu, we will be able to make a way,” James replied. “And there is one more benefit we can provide you with.”

“What is it?”

“The federal government of America will protect you from the cartels of vested pharmaceutical companies.”

“Pharmaceutical company cartels?”

“Doctor Ryu, there was an attempt to use stem cells for nerve cell treatment before. It was a pretty promising venture company called Neural Clinics. Do you know about their downfall?”

“What happened?”

“A few established pharmaceutical companies, including Schumatix and Roche, wrote press releases. It had this kind of information on it.”

James pulled out an article with the press release.

[Cancer stem cells are cancer cells that have stem cell-like characteristics. They originate from stem cells and produce various types of cancer cells.

Usually, cancer cells only produce a limited type of cells, like lung cancer creating lung cancer cells and liver cancer creating liver cancer cells, but cancer stem cells can produce all types of cancer cells and spread them throughout the body.

The safety of stem cell therapy being developed by Neural Clinics has not yet been proven, and the possibility that it can mutate into cancer stem cells still exists.

According to the research of Professor Pietro of Harvard Medicine and twelve others, tumors were found in twelve out of thirty mice that were injected with stem cells, and...]

“Well, they’re not wrong,” Young-Joon said.

“Instigation in science is usually only done with facts.”

“You’re telling me to not become like Tesla?”

“Exactly.”

In the twentieth century, Edison invented direct current electricity, and Tesla invented alternating current electricity. Alternating current electricity was more effective and convenient, and it was completely safe. But Edison knew that, too.

Feeling his livelihood threatened, Edison invented the electric chair using alternating current electricity and used it as an execution tool. It was a way to smear Tesla’s image; he had left an impression to the public that alternative current electricity was dangerous. As a result, Westinghouse, the company that invested in Tesla, almost went bankrupt.

“The truth will come out one day, but it will take a long time. The public isn’t as smart as you, Doctor Ryu. Patients all around the world are still loyal to large

pharmaceutical companies. If the cartels start instigating lies and get in your way, you will face many difficulties," James said.

"So are you saying that you will stop them from instigating lies and making threats if I move A-Bio to America?"

"No, this is still applicable even if you don't move A-Bio to America."

Young-Joon tilted his head in puzzlement.

"Even if I don't move?"

"That's right. From now on, Doctor Ryu, I am not speaking as the director of the Office of Science and Technology at the White House, but as a citizen and a scientist," James said. "I like the beliefs that you have more than your genius mind. I like the scientist side of you behind the genius side that I got to know while researching about you."

"..."

"I've seen a lot of the things pharmaceutical cartels do while being in this position. In places like Africa and India, there is unimaginable violence and immoral acts happening. Those people really calculate people's lives in terms of money."

"That's right..."

"Before I became a director, I was a professor at MIT and a scientist. Speaking as a scientist, I believe the pharmaceutical industry needs someone to show them the right attitude to have, not someone who will cultivate knowledge. Even if Prometheus brought us fire, what good would it be if the person using it was an arsonist?"

James took a deep breath.

"To be honest, that was one of the reasons why we wanted you more."

"..."

"There's only one thing that we want," James said. "It is for you to grow your company quickly without being destroyed by the manipulation of large pharmaceutical companies and advance human medicine. I'm sorry to say this, but I don't think that Korea will be able to do that properly."

“Isn’t that quite a dangerous comment?”

“Why does it matter? It’s not like this conversation is being recorded anyways. And right now. I think your future and the advancement of science is more important than the relationship between the U.S. and Korea or our honor. I want this conversation to be nothing but honest.”

“I understand what you are saying.”

“Doctor Ryu, please think globally. You are not someone who should be limited to Korea. Objectively, the U.S. can support you better. Come to America.”

James made a move.

After a moment of silence, Young-Joon spoke, “As I said before, there are no borders in science. I also am not really bogged down by what country’s citizenship I hold.”

“Then are you coming to America?”

“Even if you are going to give A-Bio a lot of support, I cannot move there. The key individuals of A-Bio are Korean scientists who first created iPSCs and a glaucoma treatment. It’s easier for me to work with people who have good chemistry with me. I don’t know about the long-run, but if I move my company, I am certain that we will lose time right now.”

“...”

“But I understand the part you brought up, Director. I do not want to lose an advantage like that. How about this? I will make an affiliate of A-Bio in the U.S., and I would like it to be partnered with the National Cancer Institute.”

“The National Cancer Institute?”

“We are also considering starting cancer research. We are currently developing a treatment for pancreatic cancer.”

James looked at him in shock. He did not know this.

“Pancreatic cancer?” James asked.

“Yes. I cannot give you data about it, but I believe it will succeed. The U.S. is the leading country in cancer research and treatment in the world. And the National Cancer Institute has extensive data about patient genetics. They dominate this field,” Young-Joon said.”If you give us access to all the data, cutting-edge sequencing equipment, all types of chemical, doctors, and technicians, we will continue cancer research there in the future. Please provide all the support you mentioned before to the affiliate company.”

“…”

James thought about it for a moment.

“You have shown significant results in the stem cell field, but there hasn’t been anything you have been acknowledged for in anticancer drugs.”

“Then you can wait until we conduct the pancreatic cancer clinical trial. We can discuss this later on.”

* * *

As soon as Young-Joon got off his escort vehicle, he ran straight to the seminar room. Kim Chul-Kwon ran behind him without difficulty, but Alice quickly ran out of breath.

‘This brings back memories.’

Young-Joon did this when he was going to present about induced pluripotent stem cells at the year-end seminar at A-Gen. He was worried that he might be late like that time, but he made it just in time.

Click.

When Young-Joon opened the door and walked inside, it was five minutes before his turn. The thousands of people filling up the first and second floor of the large lecture room all stared at Young-Joon at once.

This room was rented specifically for his presentation. It was originally a cultural space used for concerts and plays, but it was transformed into a lecture room for this conference.

The capacity of this hall was about two thousand five hundred people; it was bigger than the seminar room A-Gen had, but it didn’t look like there was room

to spare. It was because researchers who wanted to listen to this monumental presentation and passionate students came inside even though there were no more seats. They were sitting on the staircase, standing in the aisle, or leaning on the second-floor railing with a pen and notepad in their hands.

“Welcome, Doctor Ryu!” Professor Behnach said.

“Sorry I’m late,” Young-Joon replied.

“It’s alright. There’s still five minutes left.”

“I should get up there quickly.”

Young-Joon glanced at Alice. She seemed a little flustered because the lecture was bigger than she thought.

“S-Should I go up with you?” Alice asked.

“It’s alright for now. I will do the presentation and answer questions by myself.”

Young-Joon went up on the stage. It was wide, like a stage for a premier. He walked across the stage and approached the computer, step by step. He looked small from a seat faraway from the stage, but he still looked strong.

The presentation data he sent beforehand was already open on the computer. The host handed him a laser pointer that connected to the mouse on the computer.

In the tense silence, Young-Joon picked up the mic. He pressed the present button and lit up the large screen.

[The Treatment of Alzheimer’s Disease and Regeneration of the Brain Using Stem Cells]

As the title came up, there was a short round of applause from the audience.

Young-Joon stood in front of the large audience. Across from him, there were slight commotions and nervousness. There were fingers flipping through papers that were printed beforehand, the sound of pens scribbling, and the sound of keyboards clacking. Young-Joon could see desperate or hopeful tears, sighs, and prayers from a few places.

“Hello. My name is Ryu Young-Joon from A-Bio.”

Young-Joon spoke into the mic. Even the sound of breathing disappeared as the scientists focused on the presentation. Watching that, Alice felt a little thrilled. Everyone was extremely focused on this presentation: the success of phase one of the Alzheimer's clinical trial using stem cells.

"I will begin the presentation about the research where we administered stem cells to eight Alzheimer's patients and improved their symptoms."

Young-Joon began the lecture. He had used a lot of energy meeting and talking to someone like the director of the Office of Science and Technology at the White House early in the morning, but he was not mentally tired at all.

The lecture, which was filled with extensive clinical data and thorough analysis of the mechanism, went on for an hour-and-a-half and captivated the audience slowly, but intensely.

"... And so, through the MRI, you can see that the cerebral cortex has expanded again, the ventricles have gotten smaller, and that we have recovered an average of ninety-seven percent of the brain's size compared to the normal brain. The beta-amyloid imaging also confirmed that the amount accumulated had significantly decreased and was no longer found in the brains of the patients," Young-Joon said. "We have seen the same treatment effect in all eight patients, and no tumors have occurred as of now. Thank you."

The presentation came to an end.

"I guess we have about thirty minutes left. I will answer any questions if anyone has any."

Clap clap clap!

With a round of applause and shouts, hands shot up from the audience from all over.

"Can this be applied to other brain disorders other than Alzheimer's?" Rebecca, a professor at the Johns Hopkins Brain Science Institute, asked.

"We haven't tested it, but I believe it will be. I think it will be effective for strokes and Parkinson's as well."

“How did you cross the blood brain barrier?” This time, Aiden, a biology professor at Brown, asked.

“We attached a RVG29 glycoprotein to it.”

Questions poured in from all over.

“How safe is 3K3A-APC?”

“Doctor Ryu, how many people are you considering to include in phase two of your clinical trial?”

“Do you have plans to do clinical trials on patients who have a different genetic background than Korean?”

“Is there a possibility of those stem cells going to different tissues?”

Young-Joon answered each question calmly.

Then, he got an appropriate question.

“What’s A-Bio’s next target for stem cell therapy?”

“We are going to regenerate the spine.”

“The spine!”

“And we will make bone marrow as well. Next, it will be the reconstruction of cartilage and organs. We are going to start clinical trials on them in less than a year.”

“…”

‘What?’

The professors’ jaws dropped in shock. The entire audience looked dumbfounded.

“A-Bio is capable of doing that. I believe that we have proved it today. There is something I would like to create while developing these technologies. Since there are a lot of reporters here, I will also consider this a press conference and announce it right now,” Young-Joon said. “We are planning to build a hospital tailored to individual patients using organoids, tissue that mimics the

complexity of an organ, and regenerative treatment that is based on stem cells.”

“T-Take a picture...”

The audience had been told to refrain from taking pictures beforehand, but it didn’t matter anymore. Cameras began flashing from all over. Reporters’ pens and typing began writing faster. They didn’t miss one single word and wrote down everything Young-Joon was saying.

“This hospital will be the first new-generation hospital. We need a lot of money and people. Please help me.”

1. Genom doesn’t have a “j” sound like genome does, but a “g” sound. ?

Chapter 55: A Next-Generation General Hospital (2)

What was a hospital? It was where diseases were treated with treatment methods that were based on humanity’s knowledge of the human body. Hospitals in ancient times were basically a place for sorcery. Their idea of treatment was to light a fire and pray; it wasn’t really much of a hospital.

Ancient Greece created the first medical profession that was separated from the clergy. It was a prototype of the modern hospital system. The naturalist view of disease was first established, but most of the treatment was still sorcery-like. For example, they believed that one could relax their mind and have their disease cured by drinking spring water, bathing cleanly, and going through a quiet tunnel leading to the healing room. It was shocking, but back then, this method and extracting blood was considered to be a treatment method.

In Rome, a treatment center was created. It was the point where it began to be systemized and more scientific in many different ways. Significantly improved hospitals began appearing In the Islamic world during the Middle Ages; they even had a separate psychiatric department, taught professional doctors, and created a code of ethics, although their level of knowledge was quite low. It was funny in that most of the treatment was free and they gave discharged patients money for living expenses, but there were some parts that were better than now.

But for the rest of the world, treatment was still focused on taking care of patients and nursing them. It was only after the modern scientific revolution

that the concept of hospitals that was familiar to modern society appeared. The rapid development of medical science, the discovery of penicillin, the discovery of variolation, the development of anesthesia, the invention of the stethoscope, and the establishment of X-ray examination: hospitals grew rapidly as major breakthroughs came out one by one.

Hospitals, which were basically charity organizations and nursing homes before, wiped their slate clean, and the scientific approach and research to find out what diseases were and deal with them began. Their progress was extremely fast, and they became significantly better quickly.

Modern hospitals treat patients while geared up with the latest knowledge and technology in medicine and cutting-edge equipment like MRIs and surgical robots.

But they still had a limitation. magic

'Modern hospitals fail to differentiate each patient's individual characteristics.'

Of course, they did basic levels, such as differentiating between children and adults, or pregnant women. But if two adults around the same age went to the hospital for the same disease, they would be prescribed the same medicine.

What was the problem in prescribing them the same medicine if they had the same disease?

It was a problem.

"It's because the level of efficacy of the medicine can be different," Young-Joon said near the end of the question-and-answer session. "Right now, early-stage cancer patients get first-line drugs when they go to the hospital. Things like Imatinib or Erlotinib. But will they work well on those patients? Some may see effects, but there are patients who don't."

The reporters took photos of Young-Joon without rest. They had come to report on the success of the Alzheimer's clinical trial, but much more shocking news was happening live, right in front of them.

"For example, Vemurafenib is a powerful anticancer drug that catches and kills mutations that occur in a gene called BRAF. It is effective for that type of cancer cell. But what if that cancer cell has a mutation in the MEK gene? Then, those cancer cells carry resistance to Vemurafenib," Young-Joon said.

“But in modern medicine, we do not investigate the molecular characteristics of the patient’s tissues when treating them. We just use drugs like Vemurafenib and Imatinib, then switch to another one if it doesn’t work. If we use it for one month and it doesn’t work, we switch to another one. If that one doesn’t, we switch to another one after using it for a month.”

What Young-Joon was saying could be taken as a little provocative, but the doctors just nodded. It was because they knew that Young-Joon was not criticizing them.

“It is not the doctor’s fault. It’s a limitation of the system and science. There have been attempts to analyze the genetic sequence and treat patients more precisely, but it hasn’t been commercialized yet. Most hospitals feel limitations in human and material resources. So, we are just trying everything until we find one that works,” Young-Joon said. “But it is also true that this is killing patients. While we are lost, trying to look for the right drug, patients are losing precious time. So, if we make an organoid based on the stem cells I made, we can solve this problem.”

“What is an organoid?” a reporter raised their hand and asked.

“Organoids are small tissues that mimic organs. Imagine, for example, taking the liver tissue out of a patient and growing about one hundred tiny liver tumors, then treating it with one hundred different anticancer drugs.”

The reporters, who understood what he was saying, looked at Young-Joon in shock.

“It will be much easier if we use the anticancer drug that destroys the most cells among the cultivated liver tumors. It combines ultra-precise diagnosis and treatment. We can dramatically reduce the trial and error for each patient, and even if we don’t develop additional treatments, we can save a lot of patients who do not have much time by dramatically increasing the efficiency of the drugs that exist today.”

Young-Joon added, “I gave an example of cancer patients to help you understand, but simultaneous diagnostic treatments using organoids can be applied to almost any disease.”

Click! Click!

Cameras flashed continuously.

“Can organoids be made right now?” A reporter asked.

“A lot of scientists have attempted, and there has been a lot of progress, but we still have a long way to go. But A-Bio can achieve that quickly. It is because we have stem cell technology,” Young-Joon said. “We will make organoid technology that can mimic all types of organs. And we will research technology to regenerate the spine, bone marrow, cartilage, bones, fat tissue, skin, and organs. And we will use it to regenerate badly damaged structures in the body.”

Alice felt like her legs were going to give out.

‘Is that really possible? Hospitals are going to examine and treat people like that?’

“The hospital that A-Bio wants to create will be the first hospital to simultaneously perform regenerative medicine with stem cells and ultra-precise diagnosis using organoids. It will be a type of hospital that has never existed before. Just as we have moved from medieval medicine, which was just nursing homes, to science-based modern medicine, it also must be prepared to advance,” Young-Joon said.

* * *

An expert interview on Young-Joon’s presentation was on the radio. It was Professor Shin Jung-Ju from Yeonyee University Hospital.

—In late Choseon, there was a hospital called Jejung Hall, the first-ever Western-style national hospital.

Shin Jung-Ju said.

—The director who ran the hospital was a doctor and missionary named Avison, and apparently, he had a very hard time because the facilities there were lacking. They could only treat about two hundred sixty patients a day.

—Two hundred sixty patients? In a day?

The host accepted the lecture.

—Yes. So in 1990 at a medical missionary meeting at Carnegie Hall in New York, Professor Avison appealed to the audience to support the Korean medical industry. And do you know what happened?

—What happened?

—One of the famous oil kings in the U.S. who built an oil company with John D. Rockefeller at the time donated ten thousand dollars. It's billions of dollars in today's market.

—Billions? Just from one appeal? This is amazing, too. So, did Jejung Hall become bigger?

—The person who donated that money was Louis Henry Severance. And the hospital that was built with that donation was Severance Hospital. No one can deny that Severance Hospital has taken care of the health of a lot of people.

—Of course.

—I want to compare what Doctor Ryu did in the U.S. to Avison's appeal. Now, it's time for the Severances to step forward. But I don't think it is just to build a modern hospital in Korea, but it's a great experiment to advance hospitals for all of humanity.

'I know he's my friend, but is he crazy?'

Park Joo-Hyuk muttered in his head as he listened to Young-Joon's lecture after hearing the radio show at A-Bio.

People were grouped up and watched a video of Young-Joon's lecture from the International Integrative Brain Disorder Conference on the computer. They had checked it in the morning, which was about twelve hours later due to the time difference, but the world had been turned upside down in one night.

Young-Joon's name was trending, and so was the International Integrative Brain Disorder Conference and the next-generation hospital. Those three were trending for eight hours straight.

"Our CEO is so cool. He's going to do that in one year," Jung Hae-Rim said.

"Why are you acting like this is the first time you're hearing about this? He talked about this during our last team meeting. He said he's going to do all

kinds of things with stem cells, make a next-generation hospital, let's do it in a year, all that stuff," Cheon Ji-Myung said.

"No, but I didn't think he would promise the whole world that right then and there. All eyes are going to be on him once he gets the funding."

Park Dong-Hyun scratched his head as if felt like he was going to faint just from thinking about it.

"But what is an organoid?" One of the scientists asked.

"It's like a small organ. To be honest, there were some attempts to use them medically, but it was nothing but a fantasy because it's so difficult," Park Joo-Hyuk, who was listening to their conversation, replied.

"If our CEO did something like that, should we assume that we won't be going home for a year? Just thinking of that makes me excited." Cheon Ji-Myung chuckled.

"But we have a lot of new people joining us. Carpentier is coming, too," Jung Hae-Rim said.

"Most of them are coming in the second half of the year. They all worked important jobs all around the world, so they have to get things sorted and get someone to take over their work. Carpentier included."

"I guess that's true. We don't have to go home, right? That's alright, isn't it, Dong-Hyun sunbae?" Jung Hae-Rim glanced at Park Dong-Hyun.

"Oh, but I have to go see my kid. You know I'm whipped by my wife."

"I think it will be possible within a year if the CEO sets up all the basic schemes like before," Jung Hae-Rim said.

"Hey, even if our CEO is a genius, we should be suspicious that he's an alien wearing a skin suit if he can do that alone. We have to call Mulder and Scully, seriously."

"As you may remember, I have consistently insisted on the theory of reincarnation for a long time," Koh Soon-Yeol interrupted as he adjusted his glasses.

"..."

“Now, I feel like we should really investigate him out of reasonable doubt.”

“But he hasn’t failed at anything that he said he would do, right?” Park Dong-Hyun pointed out. “Let’s trust him.”

On one side of the lab, scientists from the *Science* journal who joined A-Bio earlier were sharing shocking comments.

“I want to quit all of a sudden.” Jacob had a frown all of a sudden.

“To be honest, no other company would be able to do that if it wasn’t A-Bio. And our staff aren’t just focused on stem cells, right? Professor Carpentier hasn’t arrived yet, either. Are you joining us on stem cells, Doctor Felicida?” Jacob asked.

“I had a meeting with the CEO before he left for America, but he told me to just focus on probiotics.”

“He’s going to do probiotics while doing a business that big?”

“I think he’s also going to do something with pancreatic cancer as well.”

‘Seriously?’

Jacob doubted what he was hearing.

Felicida said, “And I heard what those probiotics were about and it’s a lot more important than Jacob thinks.”

“Can we do that at such a small company like this unless he knows the answer key?”

“Don’t worry about it too much. He probably has a plan. He made iPSCs and cured glaucoma and Alzheimer’s in a few months with a small number of people, right? Now, he has thirty scientists working here. Being as genius as Doctor Ryu, he will be able to get it done if he has more hands working. I trust him.”

On the other hand, the phones at the A-Bio’s administrative headquarters were blowing up so much that the employees couldn’t bring themselves to answer it. It was the same situation at A-Gen as well. As A-Bio’s phone lines were burning up with calls and continued to be busy, people got impatient and called A-Gen.

They were reporters, investors, businesses, employees from government departments, or hospital staff. They asked what stage the research was in or asked if they could please invest. Some wanted to donate even though they hadn't made a foundation yet. In the case of hospital staff, they were asking if A-Bio could use their hospital instead of building a new one, or they were asking about working at A-Bio's hospital when it was built.

The success of the Alzheimer's clinical trial and the next-generation hospital.

It blew up.

Chapter 56: A Next-Generation General Hospital (3)

A little while before it became huge in Korea, Young-Joon had a short meeting with the professors at the conference while having lunch.

"We need a lot of doctors and technicians," Young-Joon said. "A lot of cell culture experts who have a lot of experience with clinical trials and have stem cell differentiation technology."

"Are you planning on recruiting people?" Professor Behnach asked.

"Yes. The IUBMB is happening in New York in two days. I am going to attend. I have a booth for A-Bio. I am going to meet some people there."

"Could I work at your hospital?" Professor Rebecca asked.

The other professors glanced at her, a little surprised.

"You're going to leave the Johns Hopkins Brain Science Institute?" Behnach reacted like he couldn't believe it.

"The hospital Doctor Ryu will make will be a monumental hospital in human history. Johns Hopkins is nice, but wouldn't it be nice to be a founding member of a place like that?"

Young-Joon unexpectedly scored one of the best professionals in the world while eating. He quickly expressed his gratitude.

"I would be grateful if you joined us, Professor Rebecca. You will be of great help to A-Bio. Let's tackle other types of brain diseases other than ones with nerve damage."

“But is there a reason you are gathering funding just by donations?” Behnach asked.

“It’s because I want to separate it from capital.”

“Well, wealthy people from all over the world will just give you donations for a hospital with that much potential. It’ll probably be better than most funding from investment companies.”

“That’s right. Doctor Ryu, the Bill Gates Foundation could build a new hospital building and just donate it to you.” Rebecca agreed.

“I really wish that would happen.”

“Doctor Ryu, I am not a doctor or a technician,” Professor Aiden, a biology professor at Brown University, said. “So I may not be able to work at the hospital, but I am very interested in A-Bio. I would like to study making spines or bone marrow there. Is there any space for me to join?”

“Of course. Our company has a lot of space. Everyone here is welcome at any time,” Young-Joon said.

From the afternoon, people began leaving the conference like the tide was out. Most of them were thinking that there was nothing more to see now that Young-Joon’s lecture was done. Feeling a little sorry for the other scientists for some reason, he concentrated on the afternoon seminars and debated more.

And at seven o’clock in the evening, Young-Joon, who returned from the conference, passed out on his bed. Now that he was relaxed, he felt like he was getting tired all of a sudden.

—Should I secrete some serotonin?

Rosaline sent a message.

“What serotonin?”

—You seem tired, so I will make you feel better. Since dopamine-related ones are stimulating, it’s better to use serotonin-related hormones when you are tired, like now.

Dopamine and serotonin were hormones that were both related to happiness. Dopamine provided an intense and exhilarating sensation, such as getting intoxicated or when a sexual desire was quenched. On the other hand, serotonin was related to tranquil happiness, like taking a walk on a sunny day.

“... Try it.”

[Serotonin overexpression (9%)]

Young-Joon felt his body relax as he eased up.

“You really know how to do a lot of things.”

—I secreted three hundred percent of dopamine and endorphin when you were attacked by the people Ji Kwang-Man sent.

“Really?”

—I had to reduce the pain. So when I stopped the bleeding on the back of your head and you got up, you were smiling. The gang members screamed in shock.

“... That really happened?”

‘It feels like I created an embarrassing history.’

—Yes. Then, I subdued them by only breaking their bones so that they couldn’t move. They looked at you like you were some sort of monster. They said Ji Kwang-Man’s name when I threatened them a little.

“...”

Young-Joon wondered how he got them to confess, but now he understood the story.

‘Well, who could hold out when your opponent is Rosaline?’

—But Ryu Young-Joon, are you going to keep using my powers for medicine?

“Then?”

—I think I told you this before, but you are a Player of Life, not a scientist at a pharmaceutical company. You can do something much more impactful than pharmaceuticals.

“How?”

—There are things like the biodiesel industry, right? Scientists are not good at it yet, but I can make a great innovation in that area.

Rosaline said.

—For example, bacteria can be used to break down starch to produce gasoline. A very efficient refining process can be created as well, so it will be premium oil that has almost zero impurities and only the components you want.

“... Really?”

—People say that oil is black gold or something, but to me, it’s just a carbon compound. And all organisms have the ability to break and form carbon compounds. Although, the ones each organism produces is different.

Rosaline said.

—If you manipulate a few of the genes involved in the metabolism process of bacteria, you can create a biological factory that produces oil. If you grow it in large amounts and pour in starch, you will get gasoline. The production price will be much cheaper than drilling it. If you want, you could make kerosene, diesel, LPG gas, or asphalt.

“Holy...”

—Modern civilization is based on oil resources. Everything from agriculture to industry, telecommunications, transportation, and the military industry. You know how rich countries like Libya and Saudi Arabia are, right?

Rosaline said. magic

—Just make something like that and then sell the resources exclusively to reorganize the world’s power structure around you. If you get your hands on something like that, you can be the secret dictator of the world. After that, you will be able to do whatever you want.

“... You really think differently than I do.”

—I am just considering efficiency.

“I’ll think about it. It would be nice to relieve it since the energy resource problem is also a serious matter. But I want to focus more on pharmaceuticals right now. The reason I became a scientist is because of my youngest sister, who died of liver cancer. I want to cure people’s diseases.”

—You can dominate the world with your ability, and you should because you have me. You are a prophet in terms of knowledge; your knowledge is not the same as your coworkers. Honestly, it’s frustrating that you are only using it to save people’s lives.

“Whatever. I have my own ways. Don’t nag me. I’ll deal with the energy problem later.”

Young-Joon fully laid down on the bed.

“But it’s funny. Do you feel frustration, too?”

—Frustration...

Rosaline thought for a moment.

—I see. It is fascinating. How do I feel something like that?

“Isn’t it because your synchronization level is higher? Maybe you became more human.”

Young-Joon had said that without giving it much thought, but it seemed like Rosaline was in shock.

—Are you serious?

“Why?”

—It can’t be. It seems that you are right. The higher my synchronization level becomes, my thinking becomes more gentle, and it seems like I was impacted by your emotions. Ryu Young-Joon, you have given me something called emotions. It is a very new sensation. I like it. Thank you.

“...”

‘It’s like the Wizard of Oz.’

“Are you the tin woodman?”

—Pardon?

“Never mind.”

Knock knock.

Someone knocked on the door.

“Who is it?” Young-Joon asked as he walked toward the door.

—It’s room service.

“Room service?”

Young-Joon hadn’t ordered anything. As he opened the door in puzzlement, the hotel employee was standing there with a cart loaded with a cake, a sandwich, Coke, wine, and other things.

“I never ordered room service,” Young-Joon said.

“I know. This is... I am just giving you this.”

“Pardon me?”

The employee smiled awkwardly as Young-Joon reacted like he was confused.

“I didn’t go to university, and I don’t know anything difficult like biology or medicine. But I know that you are a good person, Doctor Ryu.”

“...”

“My mother has Alzheimer’s. I hope that my mother can get treatment once the clinical trial is finished.”

“... She definitely will.”

“I think so, too. There are probably a lot of people rooting for you all over the world. I hope you work hard and do a lot of good research. I am rooting for you, too,” the employee said as he put the food down on Young-Joon’s table.

“Please call me if you need anything more.”

Click.

After the employee left, Young-Joon cut the cake.

“What do you think? It’s not making oil or anything, but this is nice too, right?” Young-Joon asked Rosaline.

—Your serotonin levels are rising rapidly even though I did not control it. Do humans like these kinds of products?

“It’s the thought.”

Young-Joon was going to rest for a little bit, but he couldn’t do that because he was so energized from the gift. He turned on his computer and went into his email inbox.

‘Let’s take a look at the progress of the tasks I assigned.’

There were nine unread emails. His A-Bio employees had sent him reports about the work he missed and meeting results. As they all knew Young-Joon’s personality, all of them skipped the unnecessary greetings and sent the reports with concise and straightforward comments... Except for one person.

[The report of the probiotics meeting results to our CEO, who is working hard in a far country like America]

The title was a little off. It was Choi Myung-Joon.

[Korea is still burning up about the bold and intense presence you showed at the international conference at Brown University. I am moved as an employee of A-Bio. But at the same time, I am worried that you are tired because of the time difference, or that the food isn’t to your liking. I should have followed you and taken care of you, but as I had too many experiments scheduled because I wanted to quickly advance A-Bio...]

‘Eek. This man.’

It was funny how he had changed completely when it felt like it was only yesterday that they were fighting and exchanging harsh words. Although, it was nice that he was good and he did what he was supposed to do well.

Young-Joon scrolled through the email, skipping through the unnecessary greetings, and opened the meeting report.

[Report on the Celligener Meeting]

As he read it, he could see there were three main items.

1. Felicida had joined the team.

2. The probiotics were effective in the mice experiment.

3. Instead of using live bacteria and establishing it in the intestine, we are considering just purifying Amuc, the diabetes-treating material. But in this case, we have to determine how to administer it to the patient.

The first two didn't matter, but Young-Joon had to give them feedback for the last item. Choi Myung-Joon and Doctor Felicida would brainstorm and strategize if he let them be, but Young-Joon could get an answer right away if he used Rosaline.

Young-Joon activated the [Advice] function of Rosaline.

"If the treatment has the same effect, an oral drug would be better than an injection, right? There's no need to pierce them with a needle.

—Of course.

"But Amuc is such a big molecule that it can't be absorbed through the digestive tract barrier."

—Attach a glycerol-modified molecule to Amuc. Then, it will be absorbed into the lymphatic vessel in the small intestine.

"You're going to tell me the detailed design, right?"

—Of course. I will show you the image now.

Rosaline sent the image into Young-Joon's head. The simplified experimental scheme of how to attach the glycerol-modified molecule to Amuc showed up.

“But I think it will be dissolved in the stomach if we go with this.”

—You found the answer to that for the pancreatic cancer treatment, right? Pass the stomach with a capsule coating.

“Good.”

Now that he thought about it, he didn’t know how the capsule coating part of the pancreatic cancer treatment was going. It was because Celligener hadn’t shared the file with him yet.

‘Since Song Ji-Hyun said that they’re coming to the IUBMB tomorrow, I’ll ask her then.’

As Young-Joon was about to close his inbox, he stopped after seeing something.

The account he was signed into right now was his CEO account, which was his personal email account. Beside the CEO account, there was the official company email inbox. It was usually used for marketing or correspondence by management. There were more than nine hundred ninety-nine unread emails.

Young-Joon squinted his eyes. When he pressed on it, after a little bit of lagging, thousands of emails came pouring out.

“What is...”

Young-Joon suddenly froze and was at a loss for words. The employee who gave him room service was not lying when he said that there were probably a lot of people who were rooting for him all over the world. He had received a huge amount of support and gratitude. Eighty percent of it was in English, and about seventy percent of them were grammatically incorrect. They were not from the Anglosphere. They were full of short English sentences, choppy Korean that was made by Google Translate, or unreadable sentences written in their own language.

[To Doctor Ryu Young-Joon. Thank you. We are hope. Hope you treatment of spine paralysis will happen soon.]

[To CEO Ryu Young-Joon and A-Bio. I am Kim Si-Joon’s wife, and he was a clinical trial patient for phase two of the glaucoma clinical trial. Thank you. My

husband can now see. Thank you for making a treatment like this. We will never forget this. We will donate to your hospital. Thank you so much.]

[Hello. My name is Emma White. I live in London, England, and I am a sixty-eight year-old woman. I am one hundred sixty-three centimeters and sixty kilograms. I heard that you needed this information. I want to volunteer for the Alzheimer's clinical trial. I am only at stage-two, but it is getting worse. I am sending you this email because I do not want to be a nuisance to my children. Thank you.]

"..."

Young-Joon read each email and slowly scrolled down. There were emails from the Middle East, India, and Mexico. All of them thanked him, said they believed in him, and that they wanted to participate in the clinical trial. Young-Joon felt a little moved reading it.

Scroll.

As he was scrolling down, his mouse stopped when he saw something.

[We want to support the establishment of A-Bio's hospital.]

It was from the Paul Getty Foundation.

Chapter 57: A Next-Generation General Hospital (4)

Ring!

While Young-Joon was reading the email from the Getty Foundation, he got a new email in his personal inbox. It was from A-Bio's management department.

[This is a collection of emails regarding donations.]

It was working hours in Korea due to the time difference. They were sorting through thousands of emails and picking out the business-related ones that Young-Joon must read. When he clicked on it, he realized that the Getty Foundation email wasn't the only one.

[We will organize small donations from individuals in a separate email and post a draft soon. We have compiled the emails that you should see as soon as possible.]

A link leading to the individual emails showed up as he scrolled down.

[This email is regarding donations from the Getty Foundation.]

[This email is regarding donations from the Abu Dhabi royal family.]

[This email is regarding donations from the British Royal Palace.]

[This email is regarding donations from the Ford Foundation.]

[This email is regarding donations from the Bill and Melinda Gates Foundation.]

[This email is regarding donations from Guo Guangchang, a wealthy Chinese businessman.]

[This email is regarding donations from Rakesh Jhunjhunwala, an Indian investor.]

‘…’

After reading them, Young-Joon saw that none of them were going to donate right now; they wanted to set up a meeting for a donation contract. Although a financial reward didn’t follow like an actual investment, people had reached out to him to donate to increase their brand worth by leaving their name on the hot topic of the next-generation hospital, or purely out of real humanitarianism.

Finally, it was time for Alice, the translator, to work after the meeting with Director James.

There was a little time before the IUBMB opened. In that short time, Young-Joon had to leave Rhode Island, check in at his hotel in New York and meet the sponsors who had the time or were in the city.

[The HR team is planning to hire a secretary for you. We will proceed if you confirm.]

That was the last sentence written in the email that management sent him. Young-Joon felt the pain that the management employees would have felt while sorting the thousands of emails.

‘I feel a little bad.’

A venture company that was launched a few months ago didn't usually receive thousands of emails overnight. It was normal for the company email, which was managed by management, to only receive a few dozen at the most.

'I didn't think that thousands of people would want to send me an email.'

The employees working in management would have also been shocked.

[Good work. Please go ahead with the secretary hire. And please list my personal email on the company website. I will receive personal emails addressed to me by that address.]

Young-Joon responded.

* * *

This year, the International Union of Biochemistry and Molecular Biology, or IUBMB, held their conference at New York University. It was not a venue strictly for academic exchange, but a place with strong business characteristics. Several start-ups and venture companies opened their booths, then went to find other booths to hold meetings and discuss each other's business. They had to move fast in order to recruit investors and staff, and they had to draw in people who were walking past by handing out gifts. Celligener was one of them.

Song Ji-Hyun was sitting at the booth with Scientist Kim Soo-Chul. They were discouraged after hitting the wall of extreme indifference.

"No one is coming," Kim Soo-Chul said in a depressed voice. "Even if we give people gifts and hold them here, they just leave, right? Ji-Hyun sunbae, what's the matter with us?"

"There are over thirty start-up booths open today, and they are all pretty well-known. Plus, there are booths from larger, medium-sized businesses as well. And most of all, A-Bio opened a booth today. Everyone is interested in A-Bio among start-ups or small companies."

"True."

Kim Soo-Chul nodded.

“But I guess he isn’t here yet.”

He pointed at the empty booth across from them. A-Bio’s booth was put along with the other start-ups and small businesses since they were classified as a venture company. About thirty people had passed by here in the last two hours in order to meet Young-Joon. Some of them even took selfies in front of the empty booth.

‘It’s not some sort of tourist attraction...’

“We’re the same venture company, but there’s a huge difference.”

“It’s because they are in the eye of the hurricane right now.”

“Ji-Hyun sunbae, didn’t you say that you kind of knew him personally? You said you had drinks with him once.”

“We did once. Just one. Before he got famous. We don’t know each other personally.”

Song Ji-Hyun’s ears became red.

Clack clack.

With the sound of dress shoes, three good-looking men wearing suits showed up. They chatted together in fluent English while glancing at A-Bio’s booth.

“He’s not here yet.”

“Do you think something happened?”

“It could have. He’s really busy, so it’s a possibility.”

Listening to their conversation, Kim Soo-Chul whispered to Song Ji-Hyun, “Sunbae, those people are from Fidelity.”

“What’s that?”

“It’s an investment company. It’s a company made by a legendary investor from Wall Street named Peter Lynch.”

“Oh.”

Song Ji-Hyun nodded.

“It would be nice if we got investments from places like that. Escape A-Gen’s hands... Right, sunbae? Should I call them?”

“I’ll talk to them.”

Song Ji-Hyun quietly left the booth with a paper gift bag in her hand and approached them.

“Hello.”

Song Ji-Hyun greeted them with a wide smile, but Fidelity didn’t seem too interested.

“Hello. We’re from a company called Celligener.”

“Oh, sorry, We’re a little busy.”

She was shot down immediately. She said goodbye in embarrassment and returned to her seat.

“It’s not easy.”

“Sunbae, look at that booth over there. They’re having a meeting with Roche.”

Located diagonal from them was a booth from a venture company called G-Protein Medicine. And employees from Roche, a huge company, were sitting at the booth doing an investment meeting.

“That’s the place doing the clinical trial for the leukemia treatment, right?” Song Ji-Hyun asked.

“Yes. The technology isn’t really that amazing if you look at their trial data, but it seems to slightly lengthen their survival.”

“It’s worth their attention.”

“*Sigh*, we shouldn’t have sold Cellicure like that,” Kim Soo-Chul added like it was unfortunate that they did.

A few more people appeared in front of A-Bio’s booth. They were administrative staff from famous medical schools and people from Schumatix,

Roche, Pfizer, and others. It seemed like they were all waiting for Young-Joon.

“Watching them be like that right in front of us... It’s a little too much,” Kim Soo-Chul said, scratching his head.

“Hello.”

Suddenly, a picky-looking man with glasses came to Celligener’s booth and sat down. It was the Fidelity employee that had told Song Ji-Hyun that they were busy.

“Oh, hello.” Song Ji-Hyun quickly greeted him. “Have you ever heard of Celligener...”

“Oh, sorry, but is A-Bio opening today? Or has CEO Ryu Young-Joon just stepped out for a little bit? I was just wondering about that.”

“...”

“I am not sure. But he hasn’t been here since we opened our booth,” Kim Soo-Chul replied. magic

“I see. Thank you.”

The man got up from his seat and returned to his group.

“Seriously...” Song Ji-Hyun mumbled in a depressed voice. “Our company is also capable and has potential too...”

“I know, right.”

“It’s not easy for a venture company to make an early liver cancer treatment just two years after starting and get it into a clinical trial,” Song Ji-Hyun complained like it was unfortunate.

More people were gathering, but there were nothing but flies flying around Celligener’s booth. There were meetings happening everywhere, but their booth was the only quiet one.

“I’m going to get some fresh air.”

Frustrated, Song Ji-Hyun stood up.

On the way out of the building...

“Our drug controls the number of white blood cells by using antibodies that target structures on their surface...”

Song Ji-Hyun could hear the people from G-Protein Medicine explain the development process of the leukemia drug to Roche. She stole a glance at them, and Roche looked quite happy.

‘They’re going to get investments from them.’

* * *

Song Ji-Hyun was having a can of coffee while sitting on the bench in front of the building. To be honest, she was envious of all the other venture company booths that were here. She was confident she could advertise the fact that they went to phase one of clinical trials with an early liver cancer treatment if someone sat down at Celligener’s booth. But the problem was that she couldn’t even get to that part. Here, Celligener was a completely nameless company. They had some people show interest, but they were buried under the booths of hundreds of famous companies.

‘Is this natural since all we’ve been doing is A-Gen’s subcontracts?’

Song Ji-Hyun let out a bitter sigh.

‘Let’s go back inside.’

Sitting out here wasn’t going to do anything. A-Bio was an unusual case, and it was probably normal for start-ups to start in indifference, like Celligener.

As Song Ji-Hyun was about to get up from the bench, she could see Young-Joon far away. Four security guards from K-Cops were surrounding him. Young-Joon was talking to three employees from A-Bio who came to help and two men who looked to be investors. The woman wearing sunglasses in the middle translated for him.

After some time, people began swarming to that group like clouds.

Swoosh!

As the main entrance doors opened behind Song Ji-Hyun, the employees from Fidelity Investments ran out. They had heard that Young-Joon was here.

Following them, people from Schumatix, Roche, Pfizer, and the IUBMB employees from New York University came pouring out. They ran toward Young-Joon as if they were escorting him inside.

“Sir!”

“Hello, sir. We are from Fidelity Investments.”

“Hello. We are from the Harvard Medicine Administration.”

“Sir, we are from the IUBMB conference. You didn’t participate as a speaker at our conference. If...”

Young-Joon was slowly walking toward Song Ji-Hyun while talking to them, but suddenly stopped.

“Oh.”

He had seen Song Ji-Hyun, who was a little frozen in surprise.

“Hello, Doctor Song,” Young-Joon said in Korean. Everyone stared at her.

“Oh... Yes. Hello,” She awkwardly responded.

“I was going to talk to you about some business if I ran into you here, but I guess I was lucky.”

The inventors and scientists around them all looked confused.

“Business?” Song Ji-Hyun asked.

“Yes. Not here. Later. You’re at your booth, right? Did you come out here to take a break?”

“Yes. I’m going to head back inside.”

“Then let’s go together. We’re probably going in the same direction anyway since all the venture company booths are beside each other.”

Young-Joon joined Song Ji-Hyun. He quickly introduced her and Celligener to the curious investors around them.

“Celligener is a Korean venture company that is doing collaborative research with A-Bio.”

* * *

Kim Soo-Chul was pacing and on his phone while keeping the empty booth. He was surprised by the sudden appearance of a large crowd. It was because in the middle, Song Ji-Hyun was talking to Young-Joon and walking together. She came to their booth, greeted Young-Joon, and returned to her seat, which was next to Kim Soo-Chul.

“What happened?” He asked.

“We met at the front of the building.”

She had received the interest of investors in the five minutes she walked here, talking to Young-Joon. As Song Ji-Hyun stood there, a little surprised at the unexpected attention, someone sat in front of her. They were the employees from Fidelity Investments.

“Pardon our behavior before.”

They formally apologized.

“We’re sorry, but could we still get to know Celligener?”

“Of course.”

Kim Soo-Chul handed them a pamphlet quickly. People were already lined up behind Fidelity Investments and waiting their turn.

Song Ji-Hyun gulped and began to promote Celligener.

“Celligener has developed Iloa, an early liver cancer drug, in just two years after launching...”

At the A-Bio booth across from them, Young-Joon was handing out USBs to two men wearing suits as gifts.

“These are USBs that have the A-Bio logo,” Young-Joon said. “The memory storage isn't very big, though.”

“Thank you. More than this, I wanted to see the A-Bio booth.”

They were the people responsible for the donation from the Gates Foundation. They had just signed a donation contract for fifty million dollars at the cafe nearby. Young-Joon was a little late to open the booth because of that, but it was okay. People who came after listening to his presentation at the International Integrative Brain Disease Conference had formed a long line in front of A-Bio's booth.

Chapter 58: A Next-Generation General Hospital (5)

Like the last time, Young-Joon was planning to put out a job listing on *Science* as well as other international academic journals. It was sad, but no matter how outstanding A-Bio was, Korea was just a country just touching on science from an international perspective.

On the other hand, the IUBMB was one of the largest academic conferences in the world. Professors from prestigious universities, key individuals from huge pharmaceutical industries, and lead scientists from labs were commonly seen here.

Young-Joon could not miss this opportunity. He met people with the intention to recruit all his staff for A-Bio and the hospital he was going to build. Fortunately, many skilled individuals came to A-Bio's booth continuously since his presence at the Integrative Brain Disorder conference was quite intense.

After hours of interviews back-to-back, Young-Joon received a call from one of the people who organized the IUBMB conference. It was Director James from the White House's Office of Science and Technology.

—America was going to scout you, a Korean, but instead, you are taking all of America's intellectuals.

James said with a chuckle.

"There are no borders to science," Young-Joon replied.

—Hahaha. Touché.

"It's not a problem, right?"

—Of course not. I think what you are doing right now is a universal advancement for humanity. Let's put aside our nationality for a while.

“A lot of people may return there after we build A-Bio’s cancer lab beside the National Cancer Institute.”

—Will you return them after training them?

“Of course not. I will learn a lot from them,” Young-Joon said humbly.

—It’s really a relief that there is someone like you in this world, Doctor Ryu.

James said.

—I also want to donate to you with my own money.

“We are ready to receive it at any time,” Young-Joon replied.

After having meetings with several people and meeting investors and donors, the time was four o’clock. Young-Joon left the booth to his employees and went to an empty conference room with Song Ji-Hyun.

“Thank you for being considerate earlier,” Song Ji-Hyun said.

“Considerate?”

“You pushed investors to come to our booth by talking to me.”

“What? I didn’t,” Young-Joon replied like he was confused.

“Huh? But... You purposely greeted me in front of people...”

“That’s normal, isn’t it? Why does it matter that we are in front of other people? If I didn’t greet my colleagues we are doing a project with and pretended to not know them, *that* would be rude.”

Young-Joon grinned.

“... But didn’t you purposely schedule a work meeting in front of the investors and reveal that we are working together?”

“I was going to talk to you about work anyway when I met you here. I don’t really care about those investors. It’s more important for me to make more progress in our research as we can by having a meeting with you than what those people are thinking and doing. But we don’t have to hide the fact that

we are collaborating companies and secretly meet each other because of them, right? It's not like it's wrong for us to collaborate with you."

Song Ji-Hyun lightly bit her lower lip.

"Right..."

Young-Joon was right. The reason that he nicely accompanied her to her booth was also probably because they had to go in the same direction. He probably had no ulterior motives. He also set up his own meeting when they held the probiotics meeting at A-Bio even though he was the CEO, did he not?

That was just the kind of person Young-Joon was. He did not engulf himself in power. He was the same person he was before becoming a star in the scientific community. He would have acted the same way even if he was an ordinary scientist who hadn't made iPSCs yet. Of course, he probably knew that his actions would push investors to Celigener, but that wasn't a reason for him to act differently.

Song Ji-Hyun had heard about Young-Joon from a few people, including Choi Myung-Joon, while working with A-Bio because of probiotics. They said he strictly went by the book and that he was a single-minded scientist who never mixed power or personal relationships with science.

He really just greeted her because she was an employee of a company he was working with, and he scheduled a meeting because he wanted to talk about work. The reason he told the nearby investors or scientists that she was from a venture company he was working with was because they were curious and he wanted to be considerate of that. That ended up being a huge benefit to Celligener and Song Ji-Hyun, but he did not do it on purpose as he had no personal feelings...

"Doctor Song?"

"Oh, yes?"

Song Ji-Hyun, who was momentarily lost in thought, was startled and quickly raised her head.

"What are you thinking about so hard? You didn't even answer me when I called you," Young-Joon said, grinning.

“Oh, sorry. What did you say?”

“The capsule coating that we’re going to use for the pancreatic cancer treatment. I want to wrap the Amuc that’s separated from *Clorotonis limuvitus* and make it into a treatment for type-2 diabetes.”

“You want to coat Amuc?”

“Yes. How is the development of the capsule coating technology going?”

“I was doing experiments right up until I had to leave for America. The technology to create a coat to protect materials from stomach acid isn’t that difficult in the first place. We also applied a part of the chitosan double-layer coating method you told us about before as well. The coating technology itself is in its final stages.”

“That’s good. We can coat a biomaterial like Amuc with that, right?”

“It should be possible.”

“Good. Let’s make some progress on the treatment for pancreatic cancer and diabetes together when we return to Korea.”

“... Sure.”

Song Ji-Hyun’s voice was weak.

* * *

On Sunday morning, Young-Joon arrived at Incheon airport. His two-week schedule in the U.S. was finished. Now, A-Bio was the center of attention internationally, and they had already received a significant amount of funds for the establishment of the hospital.

“Good work everyone. You’re all free to go. For the people who gave me their weekends, take Monday and Tuesday off,” Young-Joon said. A

After letting the employees who helped A-Bio’s booth go, he also said goodbye to Alice.

“Thank you, Alice.”

“Good work to you too, sir.”

“I’ll make sure to find you if I ever need translation.”

“Do you really need one? You are good at English.”

“I feel better if I have one.”

“Alright. Call me whenever.”

Alice put on her sunglasses and left.

After sending everyone away, Young-Joon slowly made his way back to the airport with his K-Cops security team. Then, his legs automatically froze after facing a shocking situation.

“It’s Ryu Young-Joon!”

There were hundreds of people and police covering the airport.

Flash! Flash!

The cameras of the reporters flashed from all over like fireworks.

“Doctor Ryu! Over here!”

“You’re so handsome!”

“Hospital King Ryu Young-Joon!”

‘Hospital King?’

Young-Joon looked confused.

Some people in the crowd were holding posters.

[Doctor Ryu is building a hospital]

[The Gaviscon of Science, Ryu Young-Joon][1]

[Why use taxes to build hospitals when you can get donations?]

[???: The herb of immortality? Don’t you mean stem cells?]

‘…’

“Can I have your autograph?”

“Oppa!”[ref]In Korea, people use *oppa* to call male celebrities that they like.[ref]

The police and airport security guards were blocking the crowd from getting too close, but there were a few who were too excited. The police were on edge and tried their best to maintain order.

Tap!

Someone hit Young-Joon’s shoulder as he was slightly paralyzed for a little bit from the shock. It was Park Joo-Hyuk.

“You should smile and wave your hand at them or something. You’re just going to stare into space and stand there like an amateur? You haven’t seen something like this on TV?”

“But I’m not some kind of celebrity...”

“Let’s go. Follow me. Everyone! Follow me.”

Under the protection of the K-Cops security team, Young-Joon followed Park Joo-Hyuk outside. When he got in the car, he saw some welcoming faces. It was Principal Cheon Ji-Myung, Lead Bae Sun-Mi, Park Dong-Hyun, Jung Hae-Rim, and Koh Soon-Yeol.

“What? Our entire Life Creation team is here.”

Young-Joon was surprised.

“It’s a Sunday today.”

“We didn’t come here as employees. We came here as personal friends. We are that close, right?” Jung Hae-Rim asked.

“I’m touched. Thank you so much.” magic

As Young-Joon replied, Park Joo-Hyuk stared at him, baffled.

“Hey, you didn’t say anything to me. I came to pick you up on a Sunday too.”

“Thanks,” Young-Joon replied monotonously.

“Man, how sincere of you.”

“But where are we going right now?”

“Did you have something to eat? Airplane food?”

“No. I didn’t feel like it.”

“Then let’s get something to eat first.”

Park Joo-Hyuk entered the name of a famous Korean restaurant on the car GPS.

* * *

From nine o’clock in the morning on Monday, Young-Joon met with every team, with meeting being a maximum of two hours.

“He’s like a vending machine with answers. You put in a problem and he just gives you an answer...” Jacob said with a blank face after he walked out of the CEO’s office.

Felicida chuckled when she saw his face.

“He plans all the experiments, right?”

“Yes. How can a person be like that?”

“For six hours, he’s been telling all the team members in detail how to make a spine with stem cells, how to make bone marrow with stem cells, how to make cartilage with stem cells. And telling them to do the exact experiment.”

“I seriously can’t believe it. Of course, it won’t be easy to carry out an experiment like this,” Jacob said.

When Young-Joon was developing the flu drug and treatments for domestic animals or livestock diseases, he had outsourced it. It was because those treatments were simple to make; after synthesizing it, they just had to treat animals or cells with it to check the effect.

But the difficulty of growing another structure or tissue with stem cells was on another level. It was similar to how everyone could easily make instant noodles, but the more complicated the dish was, it was difficult for someone to

make if they weren't a skilled chef, even if they had the recipe. Also, because it was difficult to control all the variables in biological experiments, they had to consider where the water was from: the Han River or Jeju Island.

It was ridiculous, but this was necessary as sometimes, the results varied depending on the line of the manufacturing factory the culture medium was made in. And for experiments that hadn’t been done before, such as the differentiation of stem cells into structures, the frontline experimenter’s ability to control the situation was especially important.

“We have to optimize the method for cell transfection by examining the condition of the cell and its differentiation stage, or use FACS salting methods. There are a lot of things we still have to mediate,” Felicida said. “But it’s doable if he sketches out the plan this well. We should be able to do it somehow.”

Click.

Principal Scientist Chloe’s team came out of the CEO’s office.

“What are you in charge of?” Jacob asked.

“Using stem cells to regenerate skin,” Chloe responded with a nervous expression. She was also given a difficult experiment and felt both passion and determination.

In the CEO’s office, Young-Joon was looking over the distribution of work among his team members again. Excluding the probiotics team and the pancreatic cancer treatment team, he had divided the remaining scientists into four teams. He had assigned them the spine, bone marrow, cartilage, and skin. The last team was the Life Creation team.

Knock knock.

Cheon Ji-Myung knocked on the door and came inside. Then, Bae Sun-Mi, Park Dong-Hyun, Jung Hae-Rim, and Koh Soon-Yeol sat down.

“What are we making with stem cells?” Park Dong-Hyun asked.

“I am going to give you organoids.”

“Organoids?”

“Yes. It is the most important thing that we are starting with stem cells. Organoids are small biological tissues that mimic a person’s organ. It has the same structure and function as organs, but it’s just smaller. To put it another way, we will be able to grow artificial organs if this succeeds,” Young-Joon said. “We will use organoids for precise diagnosis and use artificial organs to treat patients. And we are going to start that process now.”

“Oh...” Jung Hae-Rim exclaimed in worry. “To be honest, I don’t know if we can do it. It’s too difficult... None of us have worked with organoids before.”

“I know. But there isn’t anyone who has experience with organoids at our company right now. The person who applied to our company from France has done organoids before, but they said that it would take some time for them to start working here because they have to sort things out there.”

“So are you saying that we don’t have any organoid experts at our company right now?” Cheon Ji-Myung asked.

“Yes.” Young-Joon nodded.

Cheon Ji-Myung chuckled emptily.

They were starting one of the most difficult and newest technologies in the world as a new business, but they were just starting from scratch without anyone who had experience with it?

But it was Young-Joon; he was probably telling us to do it because it was possible.

“Don’t worry about the project itself because I can plan the experiment scheme. But it will still be very difficult,” Young-Joon said. “This experiment really depends on the person, so they have to be someone who is extremely trained in biology experiments.”

“...”

“That’s why I am giving it to you.”

“But there are world-class scientists at our company right now...” Bae Sun-Mi said in a dejected voice.

“I think that the people in this room right now are the most qualified. Because you have been creating life.”

The Life Creation team members looked confused.

“Does it have something to do with creating life?” Jung Hae-Rim asked.

“No, but it has one thing in common.”

“One thing?”

“That they are both impossible projects with humanity’s current level of technology.”

“...”

“I’m being serious right now. Life creation. You guys tried all sorts of different things in order to do that, right? Senior Park Dong-Hyun spat in the liquid culture medium because he tried everything that he could.”

“Ack! How did you know that?” Park Dong-Hyun asked in surprise.

“It was in the experiment log. I read it when I was at A-Gen.”

“... I wasn’t in my right mind because I was angry after getting grilled by Gil Hyung-Joon.”

“All the people who have joined our company are all famous in their own field, so I think they wouldn’t be familiar with trying something new. But not this team.”

“We did try everything and anything to make Rosaline and be a little less berated at the year-end seminar at A-Gen,” Cheon Ji-Myung said.

“Exactly. So, you will be able to do it. You would have accumulated a lot of different experimentation skills while going through hell. You can do it. Have confidence.”

“What should we do?”

“Let’s start with an organ that has a relatively easy structure.”

“Which one?”

“The intestine,” Young-Joon said. “Specifically, the small intestine. After we succeed with organoids, we are going to scale it up and create a small intestine.”

“Making an organ artificially...” Jung Hae-Rim mumbled in surprise.

“It is quite common for patients who have resected parts of their small intestine due to tumors or Crohn’s Disease to get short bowel syndrome. They suffer in pain from severe stomach aches, chronic diarrhea, fatty stool, dehydration, and lethargy. If it’s severe, they end up getting a transplant. But there is no way to do that if they don’t have a donor,” Young-Joon said. “With our technology, they won’t need a donor. Let’s be the ones to improve their quality of life.”

“Alright,” Cheon Ji-Myung replied.

Young-Joon sorted out the detailed experimentation method and told them. They were all smart elites, so the five of them quickly understood his strategy.

After they left, Young-Joon was lost in thought while holding his coffee mug. Reconstruction of the spine, bone marrow, cartilage, skin tissue, and the small intestine using stem cells: these five projects would severely threaten the livelihood of existing large pharmaceutical companies. For example, if cartilage regeneration became possible and was commercialized, all the arthritis-related drugs in the market would die.

Places like Schumatix did not do anything after his presentation at the Integrative Brain Disorder conference, but they were definitely planning something.

Young-Joon remembered what James had warned him about.

‘He said to be careful of ending up like Tesla.’

Young-Joon took a sip of his hot americano.

1. Gaviscon is an antacid product that relieves heartburn, indigestion, and other things. It’s a meme that Korean people use when something has relieved their frustration. ?

Chapter 59: A Hospital of the Next Generation (6)

Young-Joon established a hospital with funds raised through the A-Bio Foundation. He bought a large, old building in Mapo-gu in Seoul, applied for repurposing the building, and began to renovate it, and turn it into a hospital.

As Phase Three of the glaucoma clinical trial was going smoothly, they would be able to provide glaucoma treatment after the construction ended and it became a general hospital. If they could make just one small intestine organoid until then, they could perform precise diagnoses and treatment, although it would be limited to the small intestine.

These were the first services provided by the next-generation hospital. They would be able to broaden their range of treatments as the results from stem cell research came out one by one. As such, they had to get more research results as soon as possible.

And he was lucky enough to get a chance to accelerate his research even more.

“Long time no see.”

Carpentier and Young-Joon lightly hugged.

Carpentier, a professor from Caltech, was a Nobel Prize recipient. He had studied the regeneration of spinal nerves using stem cells for a long time. So, had he succeeded in recovering the nerves using stem cells? No, he hadn’t. If he had, Young-Joon wouldn’t have been doing this in the first place.

Sometimes, Nobel Prize-winning achievements sounded like magic to people, and this was the case for Carpentier as well. He had wirelessly connected the nerves of a patient with a broken spinal cord with an electrical chip. Stem cells were the main goal of his research, while this was only one of many plan-B theories, but he had actually succeeded with this instead.

The spinal cord was a long collection of nerves that was connected to the brain and ran all the way down to the waist. One of the clinical trial patients had damage in the upper region, in particular the thoracic nerves, and could not deliver messages from the brain to some regions below his chest.

Carpentier inserted extremely small electrical chips directly above and below the damaged area. As a result, when the patient wanted to walk, the excited

electrical signals from the nerves would travel through the chip, skipping over the damaged area, and be sent to the living cells below it. The patient was able to take a few steps alone in just four weeks, and Carpentier received the Nobel Prize.

He worked on this project for about twenty years. It also took four years for this treatment to reach the patient after it succeeded on monkeys. This was how careful the study was done. It was amazing how the U.S. government and Caltech both steadily funded his research for twenty years, but Carpentier's own persistence, which ultimately led to his success, was also astonishing.

Unfortunately, this technology still had limitations. Patients recovered enough to be able to walk, but they couldn't run or bend their waist. They also had to always be careful to not hit their back, which had the electrical chip. Most of all, there was no way to treat spinal nerve damage if it was higher than the thoracic nerves, as there was no technology to implant a chip in the brain yet.

Thus, Carpentier was hoping to reach the next step at Young-Joon's company.

"But Professor, aren't you busy at work? You said that you were going to join us later in the year." Young-Joon said.

"That's correct." Carpentier nodded. "But it's my sabbatical year and I happen to not be supervising any students right now. I came a bit early because I had two months to spare after taking care of a couple of things."

"Are you leaving in two months?"

"Yes, but I'll be back during the second half of the year."

"Great. Please lead our team for the two months you're here. I am so glad you joined us, Professor."

"I will try my best."

"Thank you. But because you are still working at the university, you have to sign a short-term contract as an outside technical advisor."

"Alright."

“Is this okay with Caltech?”

“Yes. There are a lot of professors who work as technical advisors for companies.”

“Good.”

Young-Joon had Park Joo-Hyuk put together the contract and got Carpentier’s signature.

“You would be more comfortable with the spine if you were to join the stem cell differentiation teams, right?” Young-Joon asked as they scheduled a meeting.

“I’m fine with the bone marrow as well.” magic

“The nervous system and the bone marrow are two completely different fields.”

“I studied that a lot as well because I studied stem cells for a long time,” Carpentier replied with a chuckle.

* * *

Jacob was in the spinal regeneration team. He went into the meeting on spinal regeneration with stem cells with six other team members.

“Professor Carpentier?”

Jacob’s eyes widened.

“Hello, Jacob. Nice to see you again.”

“What about the university?”

“It’s my sabbatical year.”

“Then, should we discuss the current progress?” Young-Joon asked.

As it hadn’t been long since the project started, most of the presentation was about establishing detailed conditions for the experiment.

“... As such, we have currently created iPSCs, and we are planning to differentiate them after injecting them into the spinal paralysis model mice.”

Jacob finished his presentation. He stared at Carpentier and Young-Joon a little nervously.

Carpentier was the first to speak.

“The biggest problem with planting stem cells directly is the development of tumors. Do you have any ideas to solve this problem?”

“So, in our project, we have selected the mechanism whereby the iPSCs will be planted in the affected area, and then the cells that have not differentiated for a certain period of time will trigger apoptosis[1],” Jacob said.

“That is quite a good idea. But will the undifferentiated cells proceed to apoptosis well?”

“When the differentiation into spinal nerves occurs, the expression of the KRAK gene is inhibited. We have cloned TP54, a cell suicide gene, on the end of this gene and expressed it.”

“Then, the cells that haven’t differentiated into nerves would keep expressing KRAK and die as TP54 is expressed as well.”

It was quite complicated, but Carpentier understood the key details of the study right away. No wonder he was a Nobel Prize recipient.

“But won’t the stem cells die before they differentiate?” Carpentier asked.

“That’s why the number of cells that succeed in differentiating is low,” Young-Joon replied for Jacob. “But we can just put in a lot of stem cells in the first place. If ten nerves have to be recovered, we would put in about a thousand stem cells. The nine hundred ninety cells would be eliminated via apoptosis and the ten that remain would become nerves.”

Carpentier nodded his head. It seemed like a harsh method, but it was the most straightforward, safe, and effective way.

Doctors administered a large amount of insulin at once when treating type-2 diabetes. This allowed them to see the effects of insulin even if it was less effective due to insulin resistance. This was the same thing.

The reason they had been unable to use this method in the past was that it was impossible to grow that many stem cells. But with the iPSC technology, this was no longer an issue.

When one powerful technology was invented, it was bound to be able to solve a lot of problems.

* * *

After the spinal regeneration team meeting came to an end, Carpentier also attended the bone marrow regeneration meeting.

“By bone marrow regeneration, you are specifically talking about making hematopoietic cells, right?” Carpentier pointed out.

“Yes,” Young-Joon responded.

Bone marrow was the fluid tissue located in the center of bones, and it was an essential structure that produced blood cells, such as red and white cells. Then, how were blood cells made in the bone marrow?

There were things called hematopoietic cells that existed in small ratios, about one in every ten thousand cells, in the bone marrow tissue. They were a type of stem cell, but they could not differentiate into other types of cell, like how embryonic or induced pluripotent stem cells could. Their self-replicating ability was only limited to blood cells, meaning that all the blood cells in the human body were made by the division of hematopoietic cells. As such, bone marrow transplants that were used to treat leukemia patients were actually hematopoietic stem cell transplants.

“We will create hematopoietic cells from stem cells,” Young-Joon said.

“Leukemia will be our main target,” Carpentier said.

“That’s right. We will treat a lot of blood diseases with bone marrow regeneration, including leukemia.”

“Then let’s try something else since we’re doing it anyway.” Carpentier pitched an idea.

“What?”

“Treating AIDS.”

There was a moment of silence around the table.

“You can treat AIDS with this?” asked Doctor Lee Jung-Hyuk, the head of the bone marrow regeneration team.

“Yes. There is only one case of AIDS being cured,” Carpentier said.

“Has AIDS been cured before?”

This was the first time Young-Joon had heard of this as well.

“Yes.”

Carpentier nodded.

Young-Joon was amazed. Rosaline knew everything there was to know about molecular biology in the universe, but it was limited to scientific facts. She couldn’t have knowledge from experience or know about things that had actually happened in the history of science. In addition, Young-Joon used to work in anticancer; since AIDS was a viral infection, it was a little far from his specialty.

On the other hand, as Carpentier was a top scientist who had been in the industry for a long time, there were a lot of cases he knew from a lot of different fields.

“The patient’s name was Timothy Ray Brown. He was once one of the most unfortunate people in the world. The reason is... He had both AIDS and leukemia at the same time,” Carpentier said.

“My God!” Doctor Lee Jung-Hyuk and the other team members exclaimed at the same time.

Carpentier went on.

“They are both famous and fatal incurable diseases. Timothy first got a bone marrow transplant to treat leukemia.”

Among the sixty donors, they managed to find someone who met the conditions and he was able to receive a transplant. Fortunately, it worked well and his leukemia was considered cured. But weirdly, the AIDS virus, HIV, was no longer found in his body.

“HIV multiplies by infecting and destroying white blood cells. The white blood cell number continues to decrease because of that, eventually reducing immunity, and ultimately killing the patient from complications,” Carpentier said. “The hematopoietic cells in the bone marrow of the donor had resistance to HIV, and the white blood cells their cells created did not get infected by HIV.”

“...”

“After time, all the white blood cells that had no resistance to HIV died, establishing the resistant ones in the body. HIV continuously decreased as it had nothing to infect and eventually disappeared.

“There was a mutation in CCR5,” Young-Joon interrupted.

“That’s right.” Carpentier nodded.

The gene CCR5 was the infection route of HIV. The white blood cells that this gene was active in could be infected by HIV. But the hematopoietic cells of the person who donated bone marrow to Timothy Ray Brown had a mutation in CCR5, and the white blood cells that came from it had mutations as well.

“It’s an interesting case,” Young-Joon said.

Carpentier smiled.

“The bone marrow that Timothy Ray Brown was donated just happened to have a natural mutation. But if we could artificially make the bone marrow, or the hematopoietic cells, with stem cells...” Carpentier said. “Then, we could alter CCR5 and make it into bone marrow that has resistance to HIV, could we not?”

“That is a good idea,” Young-Joon said.

“But sir, how would we manipulate CCR5?” Doctor Lee Jung-Hyuk asked.

Young-Joon had manipulated a lot of genes before, but he had only introduced foreign DNA into cells using viruses. Creating a specific mutation in a gene that already existed in the cell was completely different.

“That’s the problem,” Carpentier said, frowning. “I think that we should treat the stem cells with a very low concentration of chemicals that damage the DNA and select the ones that have mutations in the CCR5 gene.”

“Won’t that take a long time?” Lee Jung-Hyuk responded.

“Mr. Technical Advisor, that seems like the only option, but I think we will also have to check if other mutations have occurred in other locations as well. Then, there will be a lot of tedious work to do.”

“It will be tedious, but if we can cure AIDS patients with that, we should do it.”

“The price of that treatment will skyrocket if you consider the labor and the price of DNA sequencing. It will take a long time to treat one patient as well. Wouldn’t it be hard to commercialize it?”

“Hm...”

Carpentier was lost in thought.

It wouldn’t be easy even if they used DNA scissors that could cut part of the DNA. As they would be experimenting with the entire genome, tens of thousands of places would be cut randomly at once. They needed scissors that precisely cut CCR5 and only that.

“We have no other way. Maybe this is an impossible project,” Carpentier said with a bitter smile.

“There is a way,” Young-Joon interrupted.

There was a message in front of his eyes.

[Synchronization Mode: Check how to induce mutations in the CCR5-Δ32 gene. Fitness consumption rate: 1.7/second.]

“I will research it and tell you at the next meeting.”

1. Self-destruction mechanism for cells ?

Chapter 60: The First Product (1)

After the meeting ended, Young-Joon went to the lab instead of his office.

“Do we have Streptococcus pyogenes by chance?” asked Doctor Lee Ju-Chan when Young-Joon ran into him at the lab entrance.

“I’m not sure. I think you’re going to have to ask the microbes team for that.”

Young-Joon called Choi Myung-Joon right away.

“Hello. Do we have any strains of Streptococcus pyogenes stored in the lab?”

—We don’t have any of that in the building. We only have beneficial bacteria and a few types of pathogens.

Choi Myung-Joon replied.

Streptococcus pyogenes was a type of bacteria that caused necrotizing fasciitis. A-Bio didn’t have this bacteria as they had never studied the diseases related to this bacteria before, but not A-Gen; as they had a huge resource for research, there were numerous types of organisms kept at their company.

Young-Joon contacted the Research Support Department and requested for Streptococcus pyogenes. He received the bacteria that evening, and it was shipped in the form of colonies in a solid culture medium. He also ordered some short strands of DNA, and those were shipped along with the bacteria as well. Using these, Young-Joon obtained a DNA copy of one of the Streptococcus pyogenes genes.

[Cas9]

Young-Joon had named this great gene; it meant CRISPR associated protein 9.

From decades ago, there were reports about an unknown DNA sequence called CRISPR—clustered regularly interspaced short palindromic repeats—in bacteria. There were also frequent references to the biomaterials of various species associated with it. However, there was yet to be a clear explanation as to what CRISPR was.

However, Rosaline showed Young-Joon what no one knew.

—Cas9 is a type of genetic scissor that can cut exactly at the position you want. It is like the bacteria's immune system that they use to remove foreign genetic material.

Young-Joon's hands trembled as he thought about the potential Cas9 held.

'It can cut DNA exactly at the position I want?'

It was an item as revolutionary as induced pluripotent stem cells. Cutting DNA with genetic scissors was completely different than using scissors for paper crafts because DNA molecules were so miniscule that it was difficult to see even under a microscope. How would someone be able to cut that with handheld scissors? It was impossible.

Cutting up DNA actually referred to a set of chemical reactions; the DNA strand would be cut when it was put in solution with genetic scissors at 37?C, but as it was being cut indirectly, it was very difficult to cut the DNA at a certain location.

The method normally used was to decode the entire DNA sequence beforehand and find a unique sequence that only existed at one single location. Then, they would use genetic scissors that only recognized that one sequence to cut only at that location. This was similar to a program that found a certain word in a book and corrected it; one would find one unique word that was at a certain location, and then run a program to recognize and correct it.

Of course, the designing process for this kind of work was extremely particular, and unfortunately, it would sometimes be impossible to manipulate it at all if they couldn't find a unique sequence.

Still, many scientists have crafted small DNA fragments with this technology. Then, could one manipulate human DNA with this?

In terms of characters, there were about three billion letters of DNA in a single human cell. That was about fifteen thousand books with two hundred pages each. The amount of information wasn't just a single book, but a library. It would be impossible for a scientist to decode all that, but there was also no way for them to find a word that only existed once in the entire set of books. As such, putting genetic scissors with a human cell would just break the DNA into fragments since there would be several unique structures that the scissors would recognize. Those fragmented DNA pieces were useless and

the cell would die as well. As such, it was near impossible to manipulate a certain gene in human cells.

—But you can set the location of the strand to be cut by Cas9. Design a long target to specify the desired location and put it in with Cas9. Then, only that location will be cut.

Unlike existing genetic scissors that had a predetermined DNA structure to recognize, a person could determine the DNA structure Cas9 should recognize. For example, one would get a huge number of results if they searched up “Liu Bei” in a library database. But if they searched up “Liu Bei shared drinks with Guan Yu and Zhang Fei, became sworn brothers, and took an oath to die at the same day and time”? Only books about the Three Kingdoms would come up out of the fifteen thousand books, and the search results would only contain the part about the Oath of the Peach Garden. The scientist could program Cas9 to find that sentence and correct it.

—As such, you are able to cut exactly at one desired location.

Theoretically, any location out of the three billion strings of letters could be precisely targeted.

‘This isn’t just for manipulating CCR5.’

Young-Joon felt chills run down his spine. If iPSC was a technology based on regenerative medicine, this was a technology based on gene therapy.

Every type of genetic condition occurred because of a mutation in a gene. If they could precisely recognize and only cut the gene that was broken due to a mutation and repair it by adding a new gene? Theoretically, all genetic conditions could be cured. Although, they still had a long way to go as it was just a base technology.

“Doctor Lee, do you have the stem cells that you’re going to differentiate into bone marrow?” asked Young-Joon, who went to the bone marrow regeneration team’s lab.

“Yes, we are growing them right now.”

“Could you give me some?” Young-Joon said. “I am going to manipulate CCR5.”

* * *

At a luxurious bar in Basel, Switzerland, a middle-aged man was waiting for someone with an expensive bottle of whiskey on the table. He was Luca Taylor, the CEO of Schumatix. Later, a large man wearing a hat came into the room.

“Hello,” the man said

“Long time no see, Andrew.”

Andrew was a broker and lobbyist who helped Luca Taylor. His main areas of service were persuading the responsible departments in each country for overseas clinical trials and obtaining permission to sell new drugs from Schumatix. However, he had done dirtier things than this. Andrew was one of the people that Luca Taylor trusted the most.

“Whiskey?” Luca Taylor asked as he held up the bottle.

“I’m fine. I’m trying to cut back on drinking.”

“Then Coke?” Luca Taylor asked as he pointed to the Coke bottle.

“No, I’m okay.”

“How is it going with A-Bio? Did some of your people join?”

“Yes, a few have joined A-Bio.”

“Are the things that Ryu Young-Joon announced at the conference really being developed at A-Bio?”

“Yes, it is exactly like he said. Although, I could not gather a lot of information as each team is thorough with experiment confidentiality.”

“... I can’t believe it. They can really do that...”

“I’ve heard through rumors that they are developing a stem cell treatment that can cure AIDS,” Andrew said.

“An AIDS cure? How?”

“I don’t know how yet. Young-Joon hasn’t revealed it to anyone.”

“It’s probably difficult to copy easily even if you know how to do it. Stem cells were a minor field before iPSC technology came out. There weren’t many world-renowned experts in that field, and since they all signed contracts with A-Bio already or are set to, it’s going to be difficult for us as latecomers to catch up with them even if we figure out Ryu Young-Joons’ plan.”

“That’s true.”

“Anyway, it worries me that they are making an AIDS cure.”

“It’s bothering me as well.”

“I don’t have the slightest clue as to what he is trying to do, but if it’s released, all our antiretroviral drugs for HIV are going to retire.”

“Probably.”

“He cured glaucoma, cured Alzheimer, and he’s going to make spines, bone marrow, and cure AIDS...”

“He also said he’s going to make organs.”

“He *really* is Jesus reincarnated, isn’t he? He’s going to do all that in a year?” Luca Taylor scoffed like it was ridiculous.

“But Ryu Young-Joon really might be able to do it if you consider the things he has accomplished in the past six months. He had nothing back then, but like you said, all the world-renowned stem cell experts are on his side now.”

“I also think that he will deliver on a significant amount of what he promised. That’s why it’s even more ridiculous. Seriously, in a year, A-Gen and A-Bio will dominate the pharmaceutical industry. We won’t have space in the market.”

“What are you going to do?”

Luca Taylor silently poured himself a glass of whiskey.”

“Andrew. Are you going to drink the Coke?”

“Pardon? Oh, no.”

Luca Taylor took the bottle of Coke that was in front of Andrew.

“Ryu Young-Joon is like this bottle of Coke. He is full of people’s expectations.”

Then, he opened the lid slightly and vigorously shook it up and down.

Psh... Pop!

With the sound of air escaping, the bubbles rose to the top, pushed the lid out of the way and poured out of the opening.

“Shake him a little bit and let him explode,” Luca Taylor said as he stared at the Coke bottle, which was pouring onto the table.

“Reputation and support in this industry is like a house of cards. The public isn’t supporting him because they know the science behind it; it’s just blind faith that’s almost religious. The atmosphere will change in seconds if you show them evidence about the dangers.”

“...”

“All drugs have side effects, and they will be used as drugs if the efficacy outweighs the side effects. It’s all a matter of what is focused on.”

“Do you have a plan?”

“We have to destroy stem cells, which is the root of everything Ryu Young-Joon is working on. We are going to use a strategy that spreads the perception that it is dangerous to the world.”

“Like the time we destroyed Neural Clinics?”

“Neural Clinics was a venture company, so just spreading the word that stem cells were dangerous and getting their funding cut off was enough to destroy them. But A-Bio has A-Gen supporting them. It’s not that simple.”

“Of course. Even if we instigate things, the truth will come out eventually, and A-Bio won’t fall by then.”

“That’s right. And his funding won’t be cut off since Ryu Young-Joon has shown the world the possibility of successfully curing Alzheimer’s. We can’t get them in the same way we got Neural Clinics.” magic

“Then what are you going to do?”

“We have to drag them down and catch up to their technology.”

“You’re going to get me to drag them down, right?”

“We can’t touch the clinical trial that he’s supervising and conducting in Korea, but there’s a product that has a clinical trial ending soon.”

“The glaucoma one? That is going to go into commercialization in a couple months.”

“That’s right. That’s the first technology A-Bio manufactured. If it becomes commercialized and provided worldwide, we can use it, too.”

“Clinical trials end at Phase Three, but that’s only based on the standards of the general public. In the pharmaceutical industry, there’s a Phase Four.”

“I understand what you’re saying.”

“Feedback on problems after commercialization.”

Tung!

Luca Taylor threw the empty Coke bottle into the trash can.

“We are going to aim for that and make Ryu Young-Joon stumble. Just once is enough. When he’s no longer overestimated and A-Bio is running around like headless chickens, we can steal some of his people and technology. We can catch up to him then.”

“I understand. I will come up with a detailed plan.”

“You’re going to have to move pretty fast if there’s only a month left until commercialization.”

“Don’t worry, sir. I thought you would say that, so I already started preparing it.”

Andrew grinned.

* * *

Young-Joon was greeting friendly faces in his office. It was Nicholas Kim, the CTO of A-Gen.

“I’m thrilled to see that your company already looks this good,” Nicholas said.

“Thank you,” Young-Joon replied.

“I remember when you barged into the year-end seminar and went up to the podium.”

Nicholas was reminiscing.

“It was quite entertaining to see those violent lab directors all go silent in shock.”

“Did you? You were so quiet that I didn’t know you enjoyed that.”

“Haha, I just thought you were an ingenious and bold oddball back then, but now I see that you are a good businessman as well. To build a hospital like that with donations...”

“All I want to do is advance medicine.”

“I believe you are capable of doing that, Doctor Ryu.”

“How is A-Gen nowadays?” Young-Joon asked.

“It seems they were motivated after seeing A-Bio grow like this. Everyone is working hard. Although, the lab directors seem a little discouraged.”

“Those hot-tempered people are capable of becoming discouraged?”

“Doesn’t someone’s anger issues get resolved in front of people stronger than them?” Nicholas said with a chuckle. “Everyone is worried that you will take away their livelihood. Myself included.”

“Haha, don’t worry. I’m the CEO of A-Bio, but I am also a director of A-Gen.”

“Of course. To be honest, I like the situation now. I like that the lab directors have become nicer as well.”

“Are they nicer to scientists now?”

“It seems like the directors are scared that the scientists will leave because they keep glancing at A-Bio. They have become quite nice. In particular,

Director Gil Hyung-Joon is trying to get closer to the scientists by buying them coffee and giving them movie tickets.”

“Hahaha, I can’t even imagine what that would look like. I still clearly remember how he screamed at us during the seminar.”

“That’s why the young scientists call you Ryu Hyung-Wook.”

“Ryu Hyung-Wook?”

“They combined your name with a famous dog trainer. I heard the scientists talking about how there is no such thing as a bad director a few times.”[1]

“Oh my god.”

As Young-Joon chuckled in bafflement, Nicholas also chuckled.

“I also told the directors multiple times to be kind to their scientists, but they didn’t listen to me. To be honest, I’m grateful for you, Doctor Ryu. In this atmosphere, A-Gen should be able to progress quicker.”

“That’s a relief.”

“Please keep what I said a secret.”

“Of course.”

Nicholas took a few sips of his tea. He hesitated a little, then said, “Doctor Ryu. Have you heard anything about the pharmaceutical cartels recently?”

1. Kang Hyung-Wook is a famous dog trainer on the TV show, “There Is No Such Thing as a Bad Dog”, where Kang Hyung-Wook trains violent and bad dogs to correct their behavior. ?