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“Live your whole life as a young person in your 20s”… The world's first ‘rejuvenation drug' is about to be launched

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- **The era of living120 years is coming**
- **Reprogramming is just around the corner**
- **Turn Bio will soon ask the FDA to begin clinical trials on the world's first rejuvenation drug to turn back the clock on 'aged cells' and regenerate young and healthy skin**

Make your skin look 4-5 years younger

The key to ‘eternal’ life is stem cell-based cell reprogramming, a biotechnology that allows organs and tissues in the body to remain young without aging. The most advanced company in this field is Turn Biotechnologies, located in San Francisco, USA. The Turn Bio laboratory the reporter visited last month was busy. Preparation for clinical trials on humans was in full swing.

Turn Bio is developing a new drug that returns the skin to the state it was in 4 to 5 years ago through cell reprogramming technology.

“We are working on completing the safety and efficacy evaluation of our animal studies” said CEO Anja Krammer. “We are working towards submitting within the next year a request for FDA authorization to administer an investigational drug to humans.

Turn Bio has accumulated technology to the point where it can transform cells that are distorted, thin, and brittle here and there into bouncy ones.

“We believe that rejuvenating cells focused on the skin’s elasticity and moisture retention has the ability to significantly improve the skin and make it younger,” CEO Krammer said. “We hope to launch the world’s first rejuvenation drug in the next10 years.”

Reverses the biological age of the heart and liver

Turn Bio is also focusing on experiments to reverse the biological age of various cells other than skin.

Co-founder Vittorio Sebastiano, a professor at Stanford University School of Medicine, said, “We will also begin developing new drugs that rejuvenate major tissues and organs, such as the heart and liver. We have already completed technology verification at the laboratory level.”

The key to cell reprogramming, according to Turn Bio, is timing. Using pluripotency stem cell technology, which won the Nobel Prize in Physiology or Medicine in 2012, even older adult cells can be converted to stem cells. This can be done by exposing the cells to a specific growth factor called a “Yamanaka factor”.

Like the red jellyfish, the biological clock of cells that revert to stem cells is reset to '0 years'. However, it is difficult to predict what the reset stem will differentiate into. Cells that make up skin tissue may become strange cells, such as nerve cells or cardiomyocytes that make up the heart. They may become cancer cells. For this reason, stopping time is important when rewinding the time of a cell.

The key to cell reprogramming technology is to stop the cell clock reset in the youthful state of people in their teens and twenties.

Turn Bio is not the only company developing rejuvenation drugs based on cell reprogramming. Altos Labs, backed by Amazon founder Jeff Bezos, and Google subsidiary Calico have also jumped into the development of rejuvenation drugs that turn back the biological clock of cells through cell reprogramming.

Restoring diseased tissues and organs to their original state

Research on rejuvenation technology that turns back the time on already damaged cells and turns them into young, healthy cells is gradually yielding results. A team at the Salk Institute in the United States succeeded in returning a liver that had suffered from cirrhosis to its previous normal state using cell reprogramming technology.

Research results are beginning to emerge showing that cancer cells can be turned back into normal cells. Professor Kwang-Hyeon Cho's team at KAIST's Department of Bio and Brain Engineering reported the results of returning colon cancer and breast cancer cells to normal cells by changing the properties of cancer cells without killing them.

Professor Cho said, “If you are over 60, the probability of getting cancer increases, and cancer reversal research can help. Instead of anticancer drugs that have severe side effects, cancer can be managed with drugs that return cancer to normal cells.”

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