





Who we are...

STC is

a life science company founded in 1989 that researched and developed stem cell, gene (p62), water (energy water), cosmetic products and health food products with its life science research institute, promoting young 100-year-olds and healthy 120-yearolds.





STC-Stem Cell Treatment & Research Institute

STRI (STC-Stem Cell Treatment & Research Institute) developed a pluripotent stem cell without side effects, which has been our long-cherished wish, in 2013.

This stem cell is referred to as STC-EPN (Elicited Pluripotent by Natural Compound). STC-EPN will increase health and life quality of mankind to form a new culture.

With the vision for health life and extended lifespan of mankind without diseases and a world without starvation, mission to bring dreams to reality and pursuit of future, STRI will continue to develop new technologies.



We open up the future based on transition of thought and creative idea. We have already prepared for the future of mankind and will now start to make it come true.

STC life Science company treats obstinate diseases and aging through advanced stem cell technology, creating young 100-year-olds and healthy 120-year-olds.



Also, we are going to collaborate with prominent corporations, research institutes and hospitals around the world in various ways using STC-EPN (STC Elicited Pluripotent stem cell by Natural compound).



Management Philosophy of CEO

Harmony with the nature based on human respect and technology, and practice of love for human based on ceaseless scientific research! They are the mottos and ultimate aims of STC.

STC is a company that pursues love for human through science instead of simply striving for science. The ideology of STC is to discover secrets of life through science and to complete and love personality based on such discovery.

TREATMENT – Technology / Economic Power

The duty of STC is to find methods for promoting health of mankind based on ceaseless technological research and development, and to improve economic power of the society. STC will regard this duty as Heaven's will and continue to strive for technological improvement.

STC is a company that constantly tries to study cells, explore nature and help customers and human beings to enjoy healthy life based on customer-oriented perspective and benevolent spirit. You are the true owner of STC instead of us.



SOUL – Personality / Love

CELL – Nature / Health

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overcomin hardships struggles and despairs through the leadership of Chairman Lee, Kye Ho that helped overcome crisis, human respect management, willingness to share for social contribution, and employees who follow the leadership with respect.

STC

Management Philosophy of CEO

Chairman Lee, Kye Ho

Management for "Human Respect"

The "human respect" management philosophy of Chairman Lee, Kye Ho is well represented by management ideology and management policy. Under the concept that Soul (personality), Treatment (economic power) and Cell (health) are equivalent to Science, Technology and Customer, our slogan for contribution the mankind through development of cell therapy products with upright spirit has been applied to management policy of the company ever since its foundation in 1989. Management for human respect, management changed by action, and management preparing for the future are well shown in management policy.

Chairman Lee, Kye Ho is recruiting human resources based on an innovative "open recruitment" system to accept any competent individuals regardless of educational background, age and sex. As a result, the company now possesses the world's best stem cell technology.

Sharing Management for Social Contribution

Chairman Lee, Kye Ho has actively promoted social contribution businesses such as association for persons with disabilities and support of children adopted from overseas. An international vaccine research institute was sponsored to resolve the difference in vaccination between rich and poor nations. In addition, "Introducing History, Culture and Economy of Korea" project was hosted for US soldiers stationed in Korea as means to spread correct information about Korea.

The efforts of STC to form a win-win relationship with the society will be continued, and this was made possible by the strong will of Chairman Lee, Kye Ho who regards donation for the mankind as being natural.

Our technologies will become technologies of sharing for people around the world beyond Korea.





We are now trying to transform into the world's best bio company with strong belief and passion, overcoming hardships, struggles and despairs through the leadership of Chairman Lee, Kye Ho that helped overcome crisis, human respect management, willingness to share for social contribution, and employees who follow the leadership with respect.

It is easier to create future than to predict it. Future is what we make. Chairman Lee, Kye Ho

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PRESENT

2014

► Applied for registration of patent on patient-customized pluripotent stem cell and pluripotent stem cell strain (domestic and international applications)

2013

- ► Applied for the world's first patent on induced pluripotent stem cell using natural compound (domestic and international applications)
- ▶ Possessed largest volume of clinical cases in the world on treatment of obstinate diseases, anti-aging procedure and plastic surgery operation using stem cell (accomplished 10,000 clinical procedures)

2010

Announced largest number of clinical cases on intermediate stem cell

2009

Announced largest number of clinical cases on intermediate stem cell

2007

► Founded SCC (Seoul Cosmedi Clinic), the world's first stem cell hospital (present 97.7 B&H)

2006

► Started to commercially sell the world's first stem cell cosmetic product

2003

- ► Accomplished 100 stem cell treatment
- ► Newly established Gene Team of STRI (STC Stem Cell Treatment & Research Institute)

2001

- Started to conduct stem cell operation on human body
- ▶ Research on intermediate mesenchymal stem cell (cord blood, umbilical cord, fat, etc.)

1989~

1995

- ▶ Research on application of energy water for improved agricultural productivity
- ▶ Research on various efficacies from application of energy water in cells

1989

- Established STRI (STC Stem cell Treatment & Research Institute)
- ► HLA research on blood

1989

▶ R&D on energy water which suppresses entropy

STRI STC Stem Cell ITU

CHAPTER 1

*STC EPN (Elicited Pluripotent Stem cell by Natural Compound) Research

*Cell Differentiation Research : **Research on Stem Cell Differentiation Control**

*Disease Research



CHAPTER 1. A

STC - EPN (Elicited Pluripotent Stem cell by Natural Compound) Research

STRI STC Stem Cell Treatment & Research Institute

STC EPN (Elicited Pluripotent Stem cell by Natural Compound)

STC -EPN (STC Elicited Pluripotent Stem Cell by Natural Compound) is a pluripotent stem cell derived by separating stem cell from mesenchymal stem cell in the umbilical cord tissue, culturing it, and treating with low molecular compound extracted from natural productions. This stem cell expresses DNA gene and protein only found in pluripotent stem cell, and it can be differentiated into all cells that constitute human body including ectodermal, endodermal and mesodermal cells. Adult stem cell can only be differentiated into cells of a specific tissue, but pluripotent stem cell has a core advantage as a cell therapy product that can be differentiated into cells of all bodily tissues.

*Note: Pluripotent stem cell developed by STRI is referred to as STC-EPN.

STC- EPN (Elicited pluripotent stem cell by natural compound) can resolve ethical problems since it uses stem cell separated from adult tissues like umbilical cord and fat, show significantly short time for production with production efficiency close to 100%, and especially has no side effects like tumor caused by mutation of gene sequence from gene manipulation because natural substance is used. In addition, mesenchymal stem cell from cord shows no immunological rejection as it seldom expresses surface antigen protein. STC-EPN accompanies an advantage that it can be used on anyone without immunological rejection because it uses stem cell separated from the umbilical cord.

Our research institute increased stability of cell culture through application of energy water. When stem cell is successively cultured, genes in the chromosome are loosened, copied and then recombined during cell division. Long continuation of successive culture can generate mutations from incorrect combination and cell begins to differentiate. However, possibility of mutation is substantially reduced when energy water is used because copying of gene in the cell nucleus is stabilized.

Figure 1. Pluripotent stem cell marker was confirmed using laser confocal microscope. (Green)





was reduced.

It has no side effects and therefore has absolute advantage in clinical application. It can be used by anyone and accompanies no ethical problems that are aroused when the ovum or embryo is used. In addition, this is an innovative technology that completely changes the spectrum of global stem cell market in that this pluripotent stem cell can be application to anyone.

Analyzing OCT4, SOX2, Nanog and c-Myc as major genes of pluripotent stem cell, expression of OCT4, SOX2 and Nanog, the core genes of pluripotent stem cell, was remarkably increased. The gene related to formation of tumor, c-Myc,

CHAPTER 1. B

Cell Differentiation Research

Research on Stem Cell Differentiation Control

In the field of bioengineering, active research was conducted on tissue engineering application of stem cells and differentiation mechanism of pluripotent stem cells like embryonic stem cell and induced pluripotent stem cell, and multi-potent adult stem cells like bone marrow derived stromal cell and adipose tissue derived stem cell. Studies are underway for application of stem cell in regenerative medicine.

Especially, there had been studies on signaling mechanism and differentiation mechanism that induce differentiation of stem cell into specific cells as the differentiation potency of stem cell into diverse cells was discovered. There is also a tissue engineering attempt to create 3D tissues using stem cell. STC Stem Cell Treatment and Research Institute is studying differentiation of pluripotent stem cell derived from the umbilical cord into cells of different body organs, as well as new substances, protein, culture environments and technologies in which such differentiation can occur more efficiently.



When EPN cell was differentiated into ectodermal cell, it was differentiated into shape of a nerve cell. Differentiation was verified by dyeing the cell with nestin, which is only expressed in nerve cells, to confirm whether the cell was differentiated into a nerve cell.

Endoderm



Figure 2.

When EPN cell was differentiated into liver cell as endodermal cell, shape of liver cell was changed. Differentiation was verified by dyeing the cell with α-fetrotein, which is only expressed in liver cells, to confirm whether the cell was differentiated into a liver cell.

Mesoderm



Figure 3.

STC EPN cell was differentiated into cartilage cell and osteoblast as mesodermal cells. Cartilage cell consists of collagen and polysaccharide polymer substance. Differentiation into cartilage cell was verified by dyeing the cell with Alcian blue, which represents blue color through combination with polysaccharide having carboxyl sulfate unit at pH of 2.5. Since osteoblast consists of calcium and phosphorus, its differentiated was verified by dyeing the cell with Von kossa, an agent used to dye calcium.



CHAPTER 1. C

STRI STC Stem Cell Treatment & Research Institute

Disease Research STC Stem cell Treatment Research Institute (STRI) and 97.7B&H Clinic possess the largest number of clinical cases on stem cell in the world. We have treated various diseases ranging from treatment of obstinate diseases using adult stem cell, treatment of aging, and aesthetic treatment.

As of June 2013, we have about 10,000 clinical cases on stem cell.

In cooperation with 97.7 B&H Clinic, intermediate mesenchymal stem cell is used to treat nervous system diseases, vascular diseases, muscular and bone diseases, autoimmune diseases, damaged organs and aging.

We have shown outstanding results on treatment of diseases like leukemia, Parkinson's disease, Alzheimer's disease, degenerative arthritis, diabetes and its complications, Buerger's disease, erectile dysfunction, retinopathy, brain damage, stroke, spinal damage, myocardial infarction, imperfect blood vessels, liver cirrhosis, acute and chronic renal failure, arthritis, amyotrophic lateral sclerosis, myasthenia, multiple sclerosis, atopy, pulmonary fibrosis, scleroderma, autism, growth impairment, chronic fatigue syndrome, alopecia, facial paralysis, alopecia universalis and plastic surgery. Intermediate mesenchymal stem cell has broad differentiation potency and no side effects, and it is actively utilized for treatment of obstinate diseases.

In addition, we are conducting research on treatment of senile diseases, improvement on skin wrinkles, increase in skin elasticity and enhancement of immunity through application of stem cell in down-aging process which brings back youth to aging body.





STRIStem Cell TREATMENT REASERCE

CHAPTER 2

*Case of treatment : • Incurable Diseases • Down-aging

CHAPTER A

STRI STC Stem Cell Treatment & Research Institute

Case of treatment :

Incurable Diseases

STC has largest number of stem cell clinical data (over 10,000cases / june 2013) and it is collaborated with 97.7 B&H Clinic. There are in various of treatment for incurable disease and down aging.

It is neurological disorder, vascular disease, muscular & bone disease, Tissue / organ damage, autoimmune disease, brain disease, cord injury disease etc.



CHAPTER B

Case of treatment :

Down-aging

*STC refer to down aging instead of anti aging. Because down aging means that it can be resolved aging.

As senior population is rapidly increasing with economic development and increase in average life expectancy, problems of the aged have come to the fore in Korea and there is an increasing interest on healthy and successful aging. Also, studies unraveling the secrets to aging mechanism are showing achievements along with latest development in scientific technology and medicine, and an effort is underway to find an answer to the long-cherished wish of mankind to delay aging and further to reverse it.

Aging refers to progressive changes in the body caused by natural death and functional degeneration of body tissue cells. The skin become rough with formation of wrinkles, collagen fiber and elastic fiber are reduced, lipofuscin is increased, cellular metabolism is reduced, and repair system function on damaged cells disappears. Stem cell plays an important role in regenerating and recovering these cells. However, stem cells that exist in human body are decreased with age, and stem cells that replace degenerated cells are also reduced. Human body is aged with cardiac diseases, cerebrovascular diseases, diabetes, cancers, senile dementia and arthritis.

By increasing the number of stem cells in human body through supply of stem cells, appearance of symptoms and changes caused by natural aging instead of specific diseases can be delayed, which can slow down the progress of chronic diseases, feebleness and death.

Therefore, aging prevention therapy using stem cell can be briefly summarized as follows. First, it changes the aging process or has direct effect. Second, stem cell therapy can be used to maintain health and reduce disorders. Third, the therapy improves the entire human body instead of simply alleviating some symptoms of natural aging such as improvement on the skin. Fourth, aging prevention treatment is not simply a means to extend unhealthy and diseased life.

We discovered through experimentation that stem cells with curing ability can be artificially transported to damaged body parts and induce tissue regeneration, causing sufficient tissue regeneration as to show significant treatment effect. It was also found that angiogenesis can occur through stem cell / precursor cell in addition to cardiac tissue regeneration. We are currently using differentiation and regeneration ability of stem cell to study muscular regeneration, improvement of blood flow in ischemic tissues through angiogenesis, recovery of skin wrinkles through application of stem cell in wrinkle formation caused by death of skin cells, and prevention of aging based on functional recovery of cells in different organ tissues.

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STRIStem Cell TREATMENT REASERCH INSTITUTE

CHAPTER 3
· Accomplishment

Patent of STC pluripotent(STC-EPN)
 Patent & publications of p62



Accomplishment, A

Patent of STC pluripotent (STC-EPN)

STRI STC Stem Cell Treatment & Research Institute

Previous R&D Experiences

Patents

- 1 Method for Differentiating Pluripotency Stem Cell Induced from Mesenchymal Stem Cell into Adipocyte 10-2013-0132059
- Method for Differentiating Pluripotency Stem Cell Induced from Mesenchymal Stem Cell into Chondrocyte 10-2013-0132055
- S Method for Differentiating Pluripotency Stem Cell Induced from Mesenchymal Stem Cell into Neuron 10-2013-0132056
- A Method for Differentiating Pluripotency Stem Cell Induced from Mesenchymal Stem Cell into Osteocyte 10-2013-0132057
- Method for Differentiating Pluripotency Stem Cell Induced from Mesenchymal Stem Cell into Hepatocyte 10-2013-0132058
- 6 Method for Preparing Induced Pluripotency Stem Cell from Mesenchymal Stem Cell and Production thereof 10-2013-0131945
- Method for Preparing Induced Pluripotency Stem Cell from Mesenchymal Stem Cell Using Phlorotannin and Production thereof 10-2014-0061804
- 8 Method for preparing patient-specific Induced Pluripotency Stem Cell from adipose-derived Mesenchymal Stem Cell and Production thereof 10-2014-0072427
- S Method for Preparing Induced Pluripotency Stem Cell from Mesenchymal Stem Cell and Production 10-2014-0094601
- 10 Method for Differentiating Pluripotency Stem Cell Induced from Mesenchymal Stem Cell into Adipocyte PCT / KR2013 / 009943
- 11 Method for Differentiating Pluripotency Stem Cell Induced from Mesenchymal Stem Cell into Chondrocyte PCT / KR2013 / 009953
- 2 Method for Differentiating Pluripotency Stem Cell Induced from Mesenchymal Stem Cell into Neuron PCT / KR2013 / 009951
- 13 Method for Differentiating Pluripotency Stem Cell Induced from Mesenchymal Stem Cell into Osteocyte PCT / KR2013 / 009949
- Method for Differentiating Pluripotency Stem Cell Induced from Mesenchymal Stem Cell into Hepatocyte PCT / KR2013 / 009946
- 15 Method for Preparing Induced Pluripotency Stem Cell from Mesenchymal Stem Cell and Production thereof PCT / KR2013 / 00984
- 16 Method for preparing patient-specific Induced Pluripotency Stem Cell from adipose-derived Mesenchymal Stem Cell and Production thereof PCT/KR2014/005618

77 Method for Preparing Induced Pluripotency Stem Cell from Mesenchymal Stem Cell and Production PCT / KR2014 / 007207

Accomplishment, B

Patent & **Publications** of p62

Patents

1 A transgenic mouse for diagnosis or treatment of age-related disorder or disease comprising a knock-out p62 gene and a method of screening for a compound that counters age-related disorder or disease using the same

KP 10-0900850 (2009, 05, 27)

Role of p62 in aging-related disease

EP application (1506228) USP registered number 7435872 KP application 20050026389

Publications of p62

1 Hiruma Y, Honjo T, Jelinek DF, Windle JJ, Shin J, Roodman GD, Kurihara N. Increased signaling through p62 in the marrow microenvironment increases myeloma cell growth and osteoclast formation. Blood. 113(20) (2009) 4894-902.

2 Jung HS, Chung KW, Won Kim J, Kim J, Komatsu M, Tanaka K, Nguyen YH, Kang TM, Yoon KH, Kim JW, Jeong YT, Han MS, Lee MK, Kim KW, Shin J, Lee MS. Loss of autophagy diminishes pancreatic beta cell mass and function with resultant hyperglycemia. Cell Metab. 8(4) (2008) 318-24.

3 Yang MR, Lee SR, Oh W, Lee EW, Yeh JY, Nah JJ, Joo YS, Shin J, Lee HW, Pyo S, Song J. West Nile virus capsid protein induces p53-mediated apoptosis via the sequestration of HDM2 to the nucleolus. Cell Microbiol. 10(1) (2008) 165-76. Epub 2007 Aug 14.

4 Do EU, Jo EB, Choi G, Piao LZ, Shin J, Seo MD, Kang SJ, Lee BJ, Kim KH, Kim JB, Kim SI. Melanocortin 4 receptors interact with antimicrobial frog peptide analogues. Biochem Biophys Res Commun. 343(4): (2006) 1094-100.

5 Do EU, Piao LZ, Choi G, Choi YB, Kang TM, Shin J, Chang YJ, Nam HY, Kim HJ, Kim SI. The high throughput screening of neuropeptide FF2 receptor ligands from Korean herbal plant extracts. Peptides. 27(5): (2006) 997-1004.

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