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Current Trends in Stem Cell Research



- | | | | |
|----|------------------------|----|---|
| 1. | | 3) | |
| 2. | | 4) | |
| 3. | (Stem cell plasticity) | 5) | |
| 1) | | 6) | 가 |
| 2) | | 4. | |

1.

21

(blastocyst)

(teratoma)

(site-specific differentiation)

(trans-differentiation)

(plasticity of stem cells) 가 ,
가
(multipotentiality) 가
가
가

2.

(totipotency) ,
가
가 , 가
1998 Geiger , 가
(york sac), ,
가
(transgenic mouse for beta globin)
가 (microenvironment)
Dolly
가 가

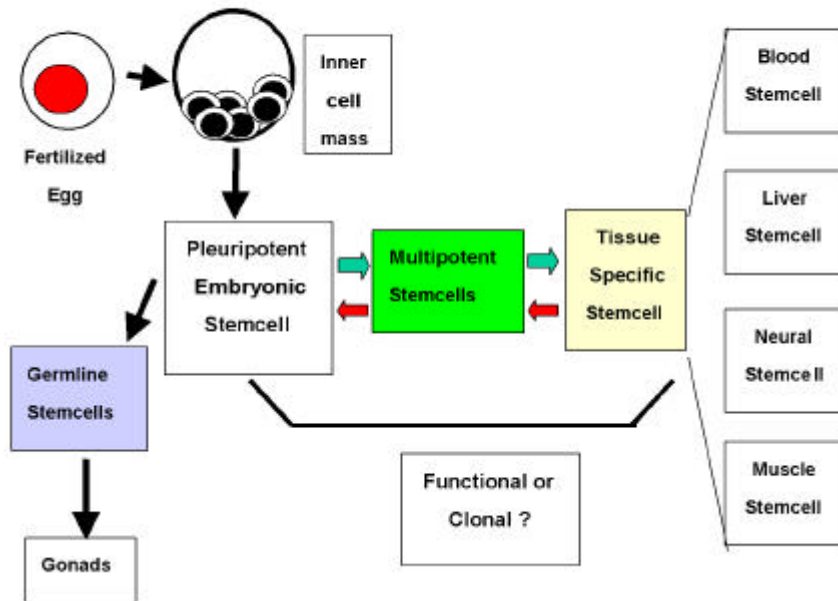
(genetic reprogramming)

2000 Clarke , 가
(neurosphere)

가 , , ,
 (notocord), (mesonephron)
 2001 Krause
 PKH

가 가
 가
 (toti-potent stem cell), (multipotent stem cell),
 (tissue specific stem cell) 가
 (clonal identity)
 가

microenvironment (stem cell as
 a function 그림1 Controversy in Stem Cell Identity



1. Controversy in Stem Cell Identity

3. (Stem cell plasticity)

가 가
가 .
가 가 가

1)

2000 Lagasse

FAH
(fumaryl acetoacetate hydrolase) 1
, NTBC tyrosinemia hepatotoxicity
(Sca-1+CD34+CD45+)
NTBC 50 % 가

30-50 %
, (c-kit+ Sca-1+ Lin-) (CD45+)
, (c-kit-, Lin+)
, 가 hepatocyte
가

(spontaneous cell fusion)
1/10
가 () .

가

(50-100 KTLS,)

Alison

2000

Y 가 가

Y 가 (hepatic tissue) 가 extra-hepatic tissue (-5%)

2)

, 2001 Orlic , EGFP(enhanced green fluorescent protein) (c-kit+Lin-) 9 68% 가 EGFP c-kit+lin-

G-CSF(granulocyte-colony stimulating factor) 가 , , 가

remodeling 가 , Orlic , 가

(neovascularization) progenitor cell: EPC (Endothelial , Kocher CD34 (neo-

vascularization) , CD34 GATA-2 CD117high CD34 가

3)

. Mezey Brazelton
microglial cell

, hematopoietic origin

NeuN, neurofilament protein

astrocyte

GFAP

Y

confocal microscope

가

가

가

action potential

가

, Hofstetter

1

debris

GFAP

neurofilament

Li cerebral stroke

BrdU

, 20% 가
5% 가

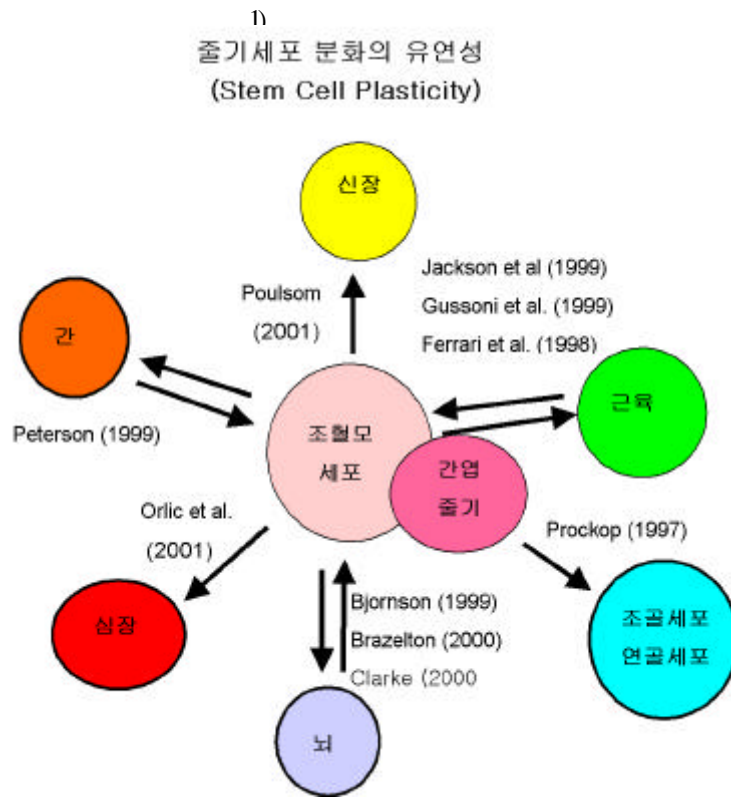
가

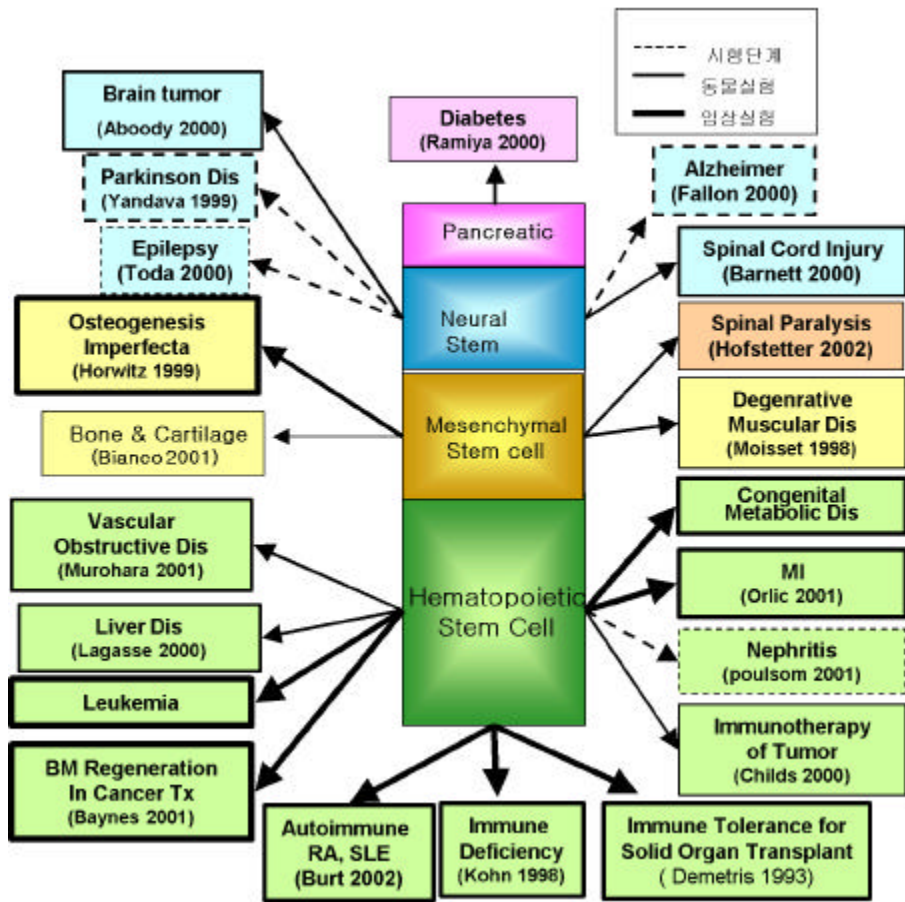
4)

(non-hematopoietic)

3 (2).

5)





3. Stem Cell Therapy in Medicine

가 가

3) .

, Lagasse 30-50%

가 , 50-100 KTLS(c-kit+, Thylo, Lin-, Sca-1+)

CD45 ()

contamination

가

, 가 Lineage

marker

가
가
가
가

6) 가

(1) (circulating stem cells):
가 , 가
가 .
가 “circulating stem cell” “stem cell biology
Heisenberg ” ,
가 mdx
MDX 가 , 가
Kawada Ly5.1 mice Ly5.2
가 Ly5.1 Ly5.2가 chimeric
mice , chimeric mice
Ly5.1 ,
가 가
가
bipo-
tential , 가
가 Hoechst 33342 dye exclusion
SP(side populatioin)
가
가

가 가 .

, Reyes , , (neuron, astrocyte, oligodendrocyte)

MAPC(multipotent adult progenitor cell)

MAPC 가 ,

가 가 .

(2) (transdifferentiation): 가 가

(retro-differentiation) 가 ,

(trans-differentiation)

가 가 . 가 ,

가 embryo adult

mice genetic reprogramming 가

가 lineage .

. Kondo oligodendrocyte growth factor

oligodendrocyte precursor cell(OPC)

astrocyte, oligodendrocyte

가 가 .

B-lymphocyte commitment pax 5 가 pro-B cell

(T-cell, NK cell, neutrophil, dendritic cell)

가 trans-differentiation

가

, Shen (hepatocyte)

dexamethasone 14

hepatocyte 가 c-EBP/beta 가

c-EBP/beta

, 가

hepatocyte ,

. , 293T 가 cell extract
 T- . ,
 CD3 T- 293T cell
 fibroblast permeablization , T-
 (NF-kB, NF-AT, Oct-1) import
 , nucleosome remodeling complex
 BAF complex IL-2 promoter histone acetylation nuclear
 reprogramming , T-
 , CD3, CD8, T-cell receptor
 IL-2 , T-lymphocyte가 가
 가 reprogram fibroblast .
 가
 nuclear reprogramming
 .
 nuclear reprogramming
 가
 ,
 가 .
 (3) : genetic reprogramming ,
 . Tada (23, 24) nuclear
 reprogramming , 가
 (pluripotency) . Ying (6)
 (neurosphere)
 가 ,
 nuclear programming genetic program
 ,
 (Oct-4) Alkaline phosphatase, stage-specific
 embryonic antigen(SSEA-1)
 (cardiomyocyte, neuron, extraembryonic endoderm) . blastocyst

Terada (7)

가 4 (tetraploidy) 6

가

NOD/SCID mice

teratoma

가

nuclear programming

가

가

4.

가

가

가

가

가

가

가

nuclear

reprogramming

가

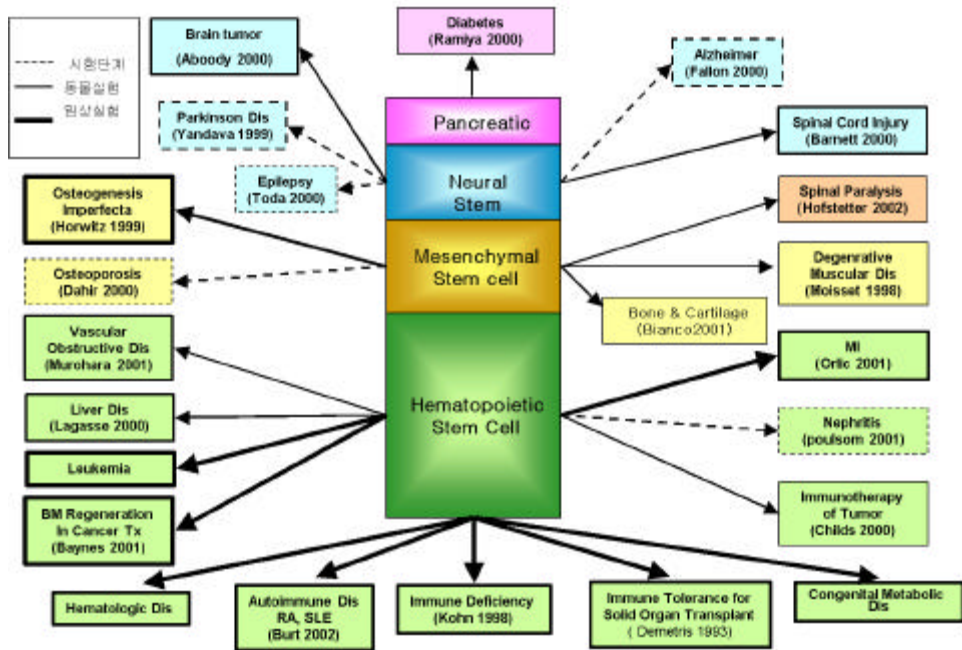
가

가

(heterogenous)

그림 4

Stemcell Therapy in Medicine



4. Stem Cell Therapy in Medicine

가

가

가

가

(

4),

가

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