

노화개념 인식전환과 기능적 장수

Revolutionary Concept on Aging and Functional Longevity

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Abstract

The rapid increase of the elderly population has generated unprecedented social and cultural conflicts. One of the fundamental factors underlying these turbulences would be the traditional concept on aging and the elderly, which has been prevailed by the negative view as an irreversible and inevitable process. However, the recent researches have revealed that aging is a biological process not for death but for survival, suggesting a responsive and adaptive aspect of being aging. This revolutionary change in the concept on aging may provoke a confident aspect of aging, leading to a more productive and active participation of the elderly in the community. Therefore, the traditional view on aging, as a functionally deteriorated and morphologically altered state of the organism, should be corrected. Based on this new concept, the policy and strategy for the future society should be re-planned. Moreover, the elderly individuals should try to maintain the best condition toward the functional longevity without despair or discourage. In this article, I briefly introduce the novel hypothesis on aging, that is, "The Gate Theory of Aging", and discuss the replace vs restore principles for aging control.

Keywords : **Functional longevity; Replace; Restore; Gate therapy; Aging**

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(長壽)

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(老人文化)

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DNA

가? (7).

1. (Survial Strategy)
가
가
가

(universality)
(irreversibility)
(inevitability)
가
가
가

2. : ?
(apoptosis re-
sistency) (hypores
ponsiveness to mitogenic stimuli) 가
(growth factors)

(human diploid
fibroblast, HDF) 가
가 (非可逆性, irreversibility)

가

4. 가, 가? .
 (janus) . 가 가
 ,
 가 (不可分) ,
 . 가
 , 가 ,
 . (mean life
 span) 가
 (maximal life span)
 .
 (calorie restriction)

가 ,
 (gerontogene) 가 가
 (longevity - assurance gene) 가 .

5. - Gate Theory of Aging

(catalase superoxide dismutase)
 G 가 300 가 가 .
 가 ,
 가
 (Aspect theory)

(Baltimore longitudinal study on aging, BLSA) 가 ,
 (種) 가
 가 ,
 가,
 가

가

가

가 (affini-

ty) 가

가

(Stress - induced premature senescence, SIPS) 가

(receptor - mediated endocytosis)가

가

caveolae

가 caveolin 가 (6), clathrin

amphiphysin 가

(5). caveolin 가

가 amphiphysin

gene chip proteomics

(functional restora-

tion) 가 (3).

가

(gatekeeper molecules)

가 caveolin, amphi-

physin G

가

가

(老化場, aging field)

가

가 . 가 . 가 . 가 .
 가 가 , ,
 가 . 가 .
 가

(老化大門說, Gate theory of aging)

(Functional Longevity)

(9).

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(種)

가

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가 가

가

가

가

가

2.

가?

가

가

가

가

가

가

(Culture), (Productivity)

가



(Safety),

1. 2001 ; 44(8) : 806 - 12
2. , 2001 : 277 - 99
3. Cho KA, Ryu SJ, Park JS, Jang IS, Ahn JS, Park SC. Senescent phenotype can be reversed by reduction of caveolin status. J Biol Chem 2003 ; 278, 277 : 89 - 98
4. Park SC. Functional recovery of senescent cells through restoration of receptor - mediated endocytosis. Mech. Aging Devel 2003 ; 123(8) : 917 - 25
5. Park JS, Park WY, Cho KA, Kim DI, Jhun BH, Park SC. Down - regulation of amphiphysin - 1 is responsible for reduced receptor - mediated endocytosis in the senescent cells. FASEB 2001 ; 15 : 1625 - 7
6. Park WY, Park JS, Cho KA, Kim DI, Ko YG, Park SC. Up - regulation of caveolin attenuates epidermal growth factor signaling in senescent cells. J Biol Chem 2000 ; 275 : 20847 - 52
7. Suh Y, Lee LA, Kim WH, Han BG, Vihg J, Park SC. Aging alters the apoptotic response to genotoxic stress. Nature Medicine 2002 ; 8(1) : 3 - 4
8. Yeo EJ, Hwang YC, Kang CM, Choy HE, Park SC. Reduction of UV - induced cell death in the human senescent fibroblasts. Mol Cells 2002 ; 10(4) : 415 - 2
9. Yeo EJ, Park SC. Age dependent agonist - specific dysregulation of membrane - mediated signal transduction ; emergence of the gate theory of aging. Mech. Age Dev 2002 ; 123 : 1563 - 78