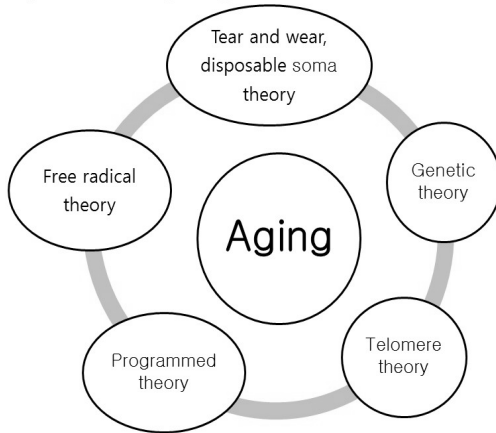


# 장수 유전자 SIRT1 (허혈성 뇌졸중과 운동)

이재민

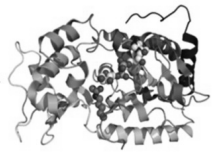
경희대학교

## Lifespan – aging



## Sirtuins

- **Sirtuin** or **Silent information regulator (Sir2) proteins** are a class of proteins
- **Promote an increased life span**
- Sirtuin 1 (SIRT1), a member of the sirtuin family of nicotinamide adenine dinucleotide (NAD<sup>+</sup>)-dependent deacetylases
- **Mammals contain seven sirtuins (SIRT1-7)**

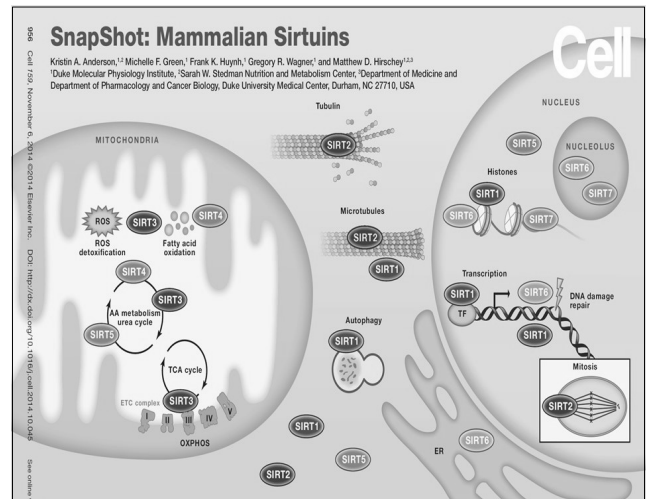


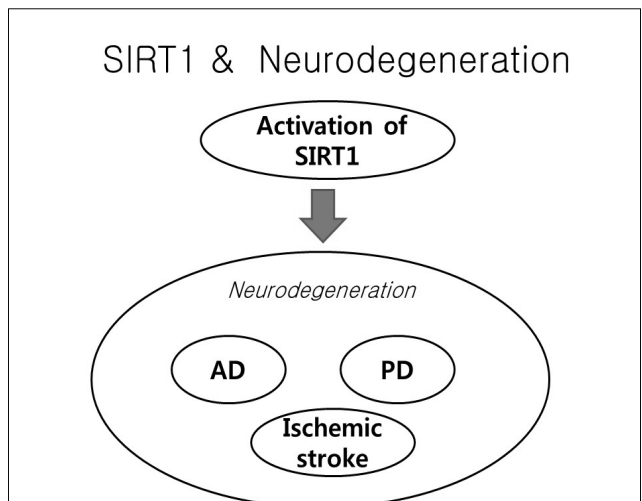
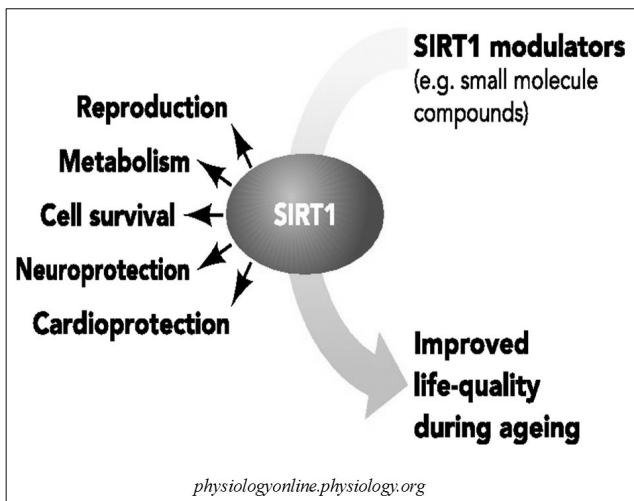
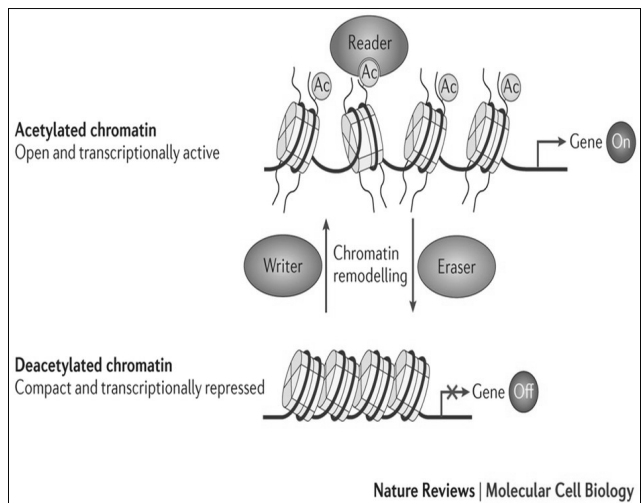
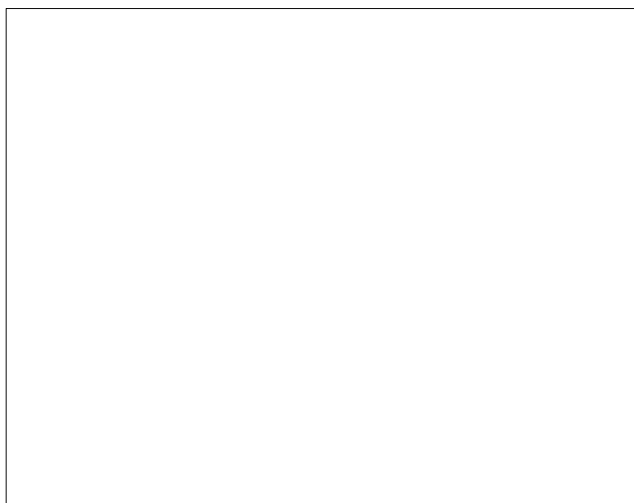
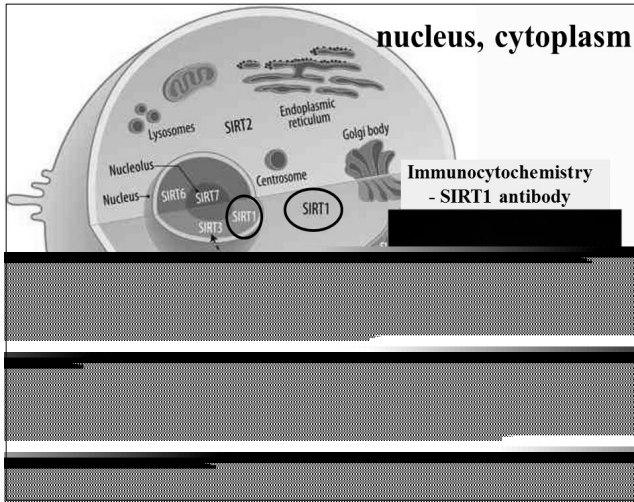
<https://en.wikipedia.org/wiki/Sirtuin>

## Sirtuins localization & function



No	location			enzymatic function	function
	Nucleus	Cytoplasm	Mitochondria		
SIRT1	○	○		Deacetylase	metabolism, inflammation
SIRT2		○		Deacetylase	cell cycle, tumorigenesis Energy expenditure regulation
SIRT3	○		○	Deacetylase	metabolism
SIRT4			○	ADP-ribosyltransferase Weak deacetylase	insulin secretion
SIRT5			○	Weak deacetylase NAD-dependent protein lysine Desuccinylase	ammonia detoxification
SIRT6	○			Weak Deacetylase, ADP-ribosyltransferase	DNA repair, metabolism, TNF secretion
SIRT7	○			Deacetylase	DNA transcription





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ISSN 1414-431X

### SIRT1 negatively regulates amyloid-beta-induced inflammation via the NF-κB pathway

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- Sirtuin 1 (SIRT1) regulates inflammation via inhibition of nuclear factor-kappa B (NF-κB) signaling
- MMP-9 has been reported to modify barrier function by disrupting TJ proteins
- SIRT1 activation could inhibit Aβ-induced expression of MMP-9

Free Radical Biology and Medicine  
Volume 41, Issue 12, 15 December 2006, Pages 1781–1794

Original Contribution  
**Protection by EGb 761 against β-amyloid-induced neurotoxicity: Involvement of NF-κB, SIRT1, and MAPKs pathways and inhibition of amyloid fibril formation**

Fanny Longpre<sup>a</sup>, Philippe Garneau<sup>a</sup>, Yves Christen<sup>a</sup>, Charles Ramassamy<sup>a,c</sup>

- Aβ peptide-induced toxicity is mediated through oxidative stress and is associated with an activation of intracellular signaling (such as the transcription factor NF-κB and MAPK pathways)
- **EGb 761** can also activate SIRT1 (EGb 761 is a well-known antioxidant)
- The synthesis of p65 and its nuclear translocation induced by Aβ<sub>25-35</sub> are inhibited in the presence of EGb 761

The EMBO Journal (2007) 26, 3169–3179 | © 2007 European Molecular Biology Organization | All Rights Reserved 0961-4196/07  
www.embojournal.org

THE EMBO JOURNAL

### SIRT1 deacetylase protects against neurodegeneration in models for Alzheimer's disease and amyotrophic lateral sclerosis

- **Levels of SIRT1 in models of neurodegeneration**
  - ✓ SIRT1 levels may increase as a protective response to neurodegenerative conditions
- **Resveratrol-mediated SIRT1 activation protects against p25**
  - ✓ Overexpression of p25: display massive degeneration of forebrain with features of AD

### Silent Information Regulator 1 Protects the Brain Against Cerebral Ischemic Damage

Macarena Hernández-Jiménez, PhD<sup>\*</sup>; Olivia Hurtado, PhD<sup>\*</sup>; María I. Cuartero, MSc; Iván Ballesteros, PhD; Ana Moraga, MSc; Jesús M. Pradillo, PhD; Michael W. McBurney, PhD; Ignacio Lizasoain, PhD, MD; María A. Moro, PhD

Sirt1  
p-actin

S 18h 24h 48h 7d

SHAM

pMCAO

1 EXPRESSION (A.U.)



