



ANTI-AGING LIVING

Presented by

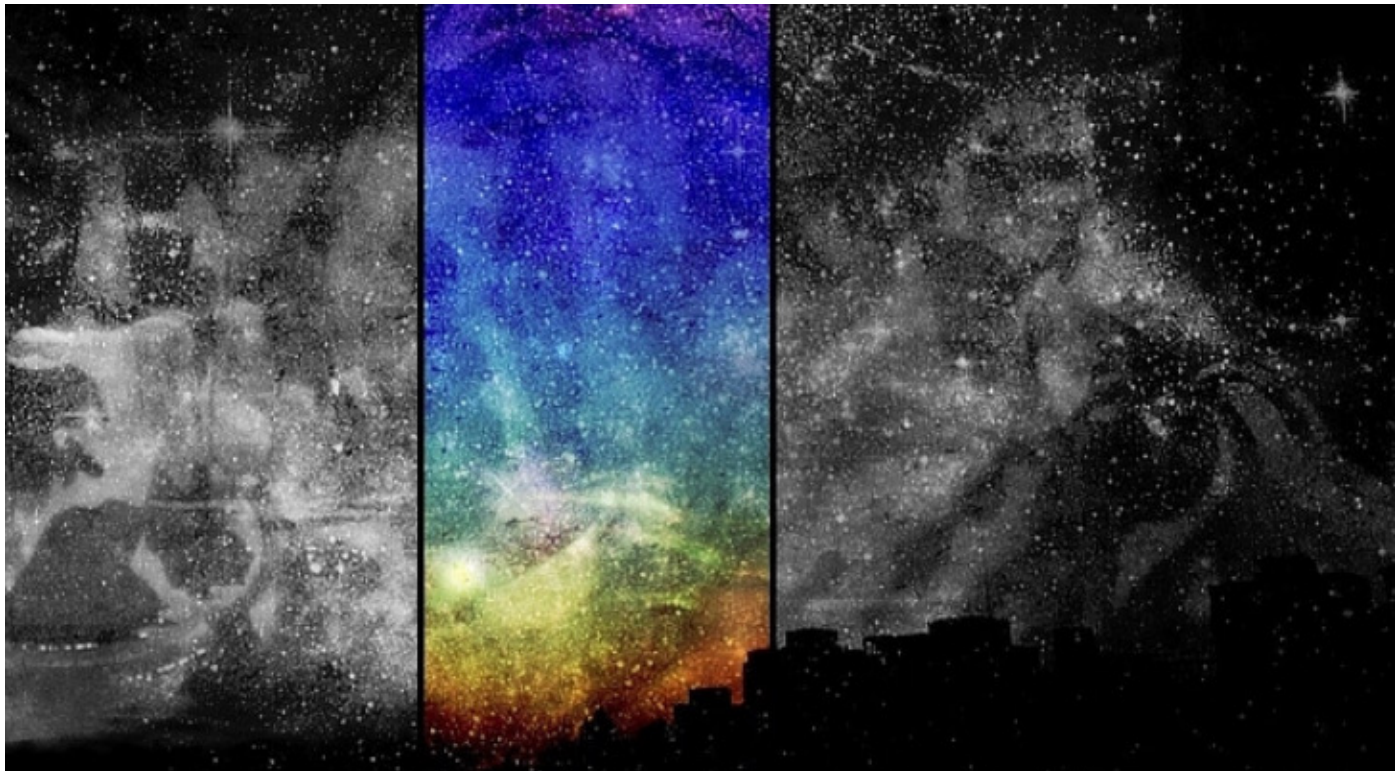
Mindfulness In Biz

October 2019

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HUMAN BODY'S POWER ENGINE



HUMAN BODY'S POWER ENGINE

Mitochondria (線粒體) is the intracellular generator

Our body has different metabolic pathways that it uses to provide energy for our cells. **Glycolysis** (using sugar for fuel), **Gluconeogenesis** (turn the amino acids from protein into fuel) and **Lipolysis** (using fat for fuel through beta-oxidation) are the most well-known metabolic pathways.

Human body's energy generation process:

❖ Fuel Sources

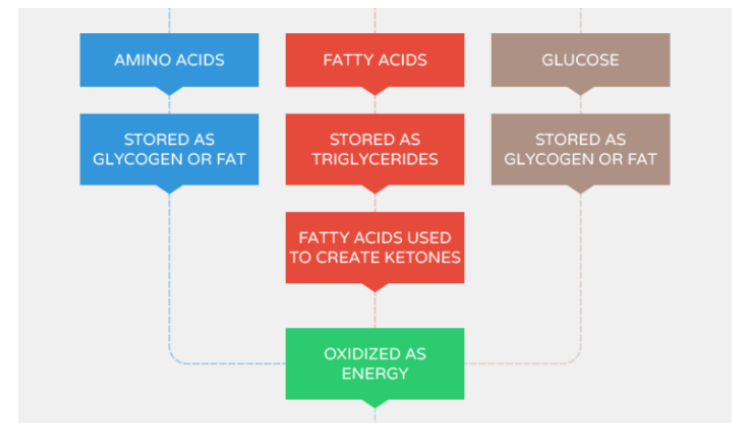
- ✧ Glucose (葡萄糖) <- Carbohydrate
- ✧ Amino Acids (胺基酸) <- Protein
- ✧ Fatty Acids (脂肪酸) <- Fat

❖ Mitochondria

❖ Coenzyme Q10 (CoQ10)

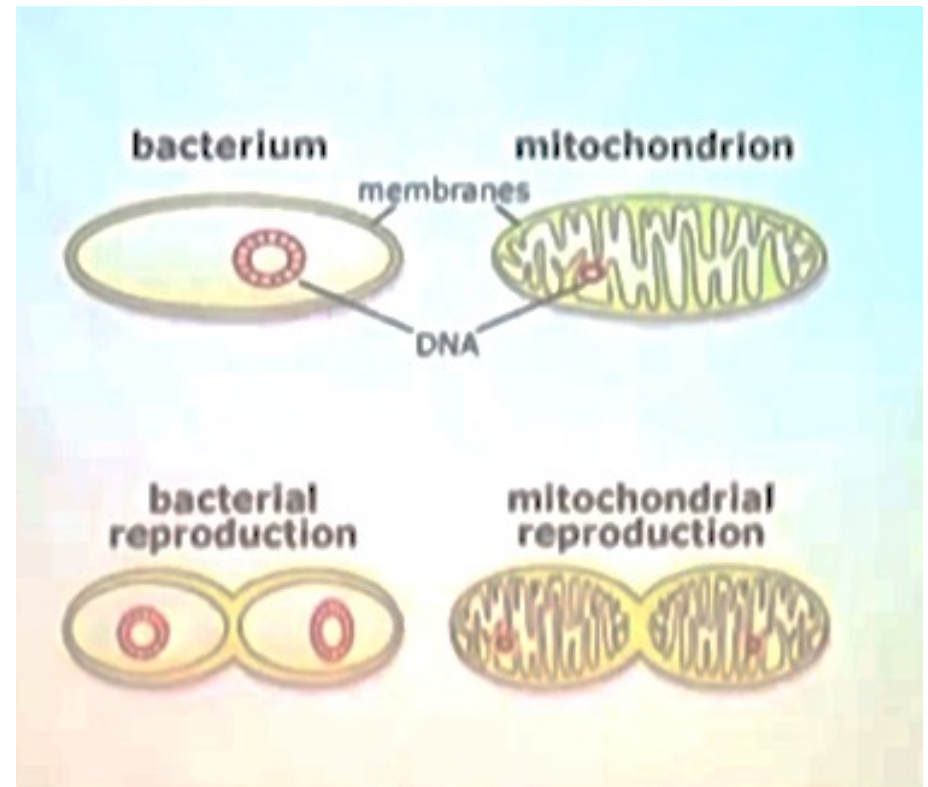
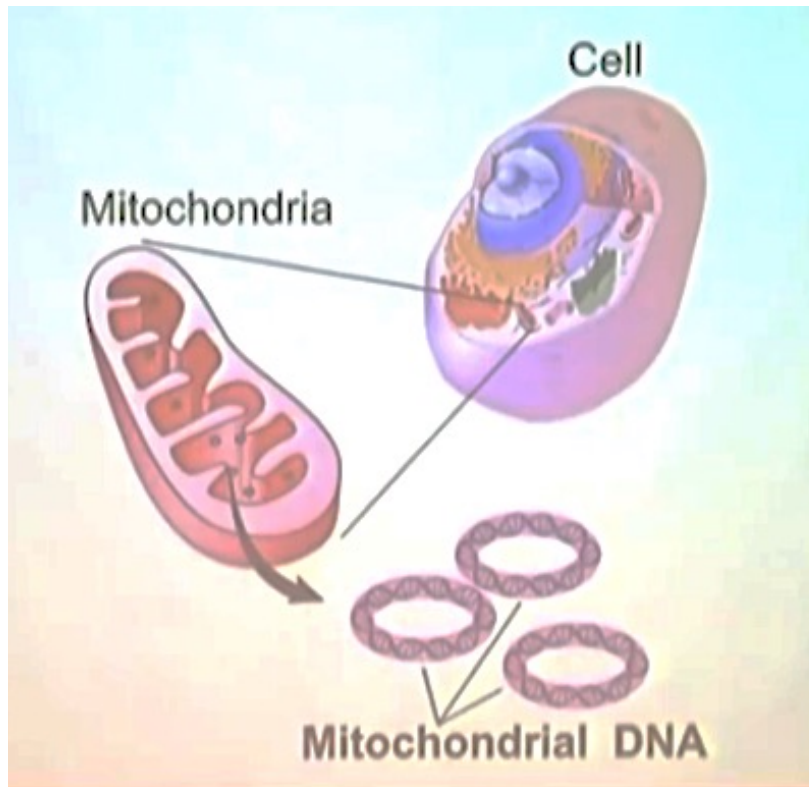
(the process in which cells use oxygen to break down food to produce cellular energy)

❖ ATP (Adenosine Triphosphate, 95% of human body's energy)



HUMAN BODY'S POWER ENGINE

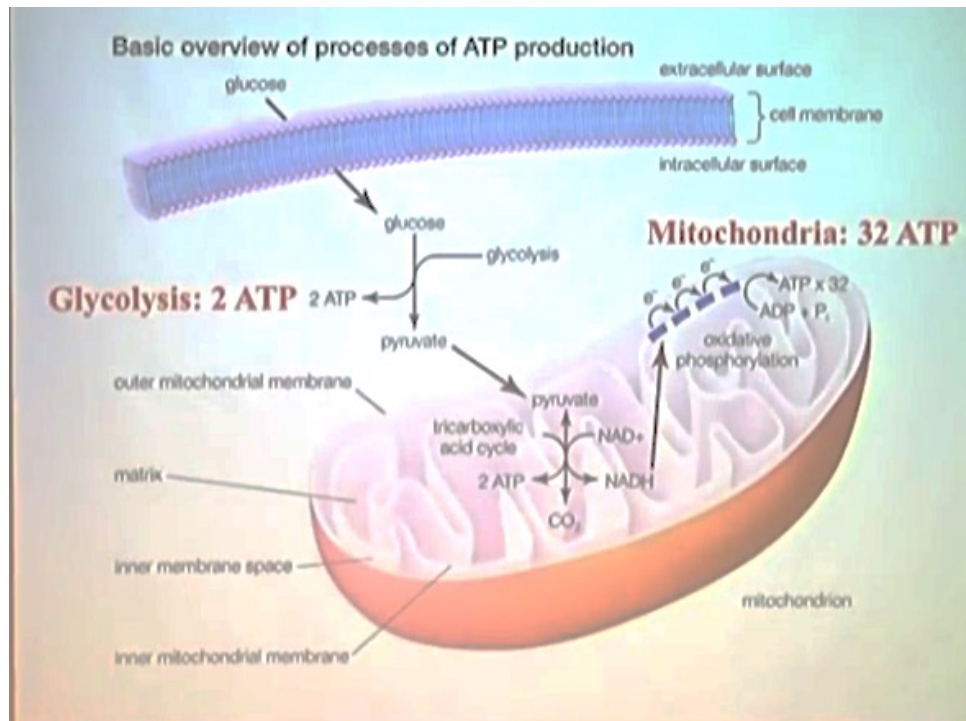
Mitochondria – Bacterium in a Cell



HUMAN BODY'S POWER ENGINE

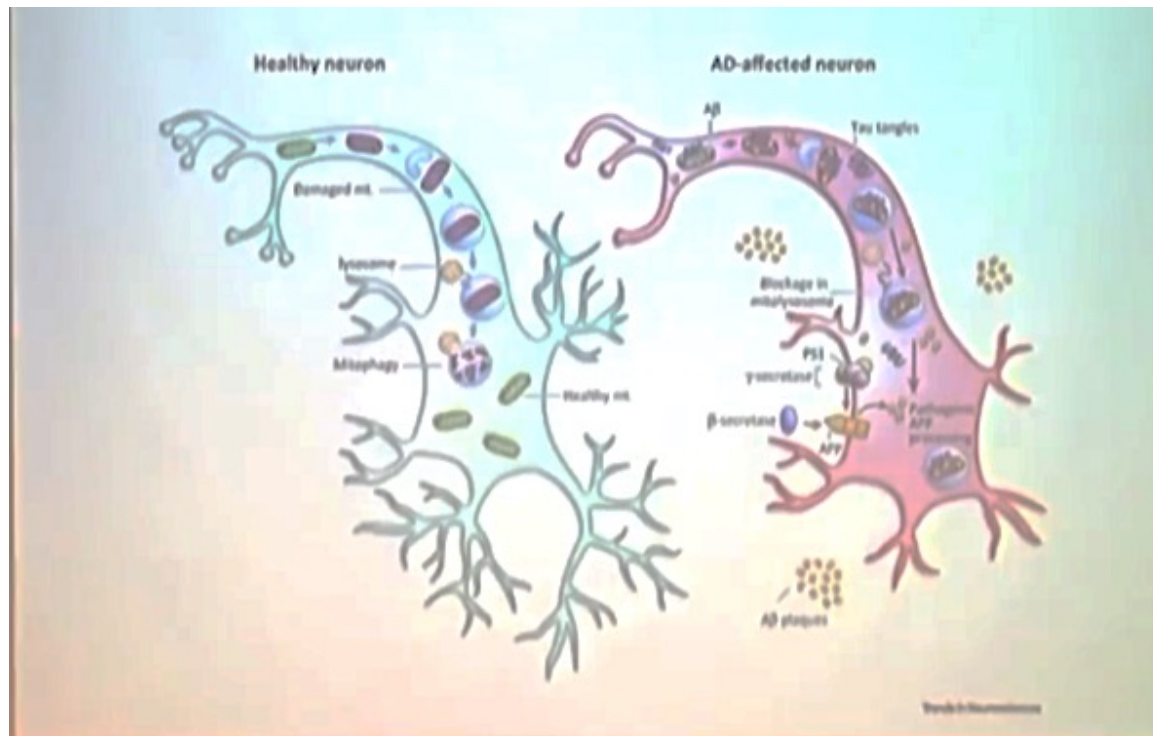
There are

- Over 10,000 mitochondria in brain cells and heart, liver and kidney cells
- Over 100,000 mitochondria in ovarian cells

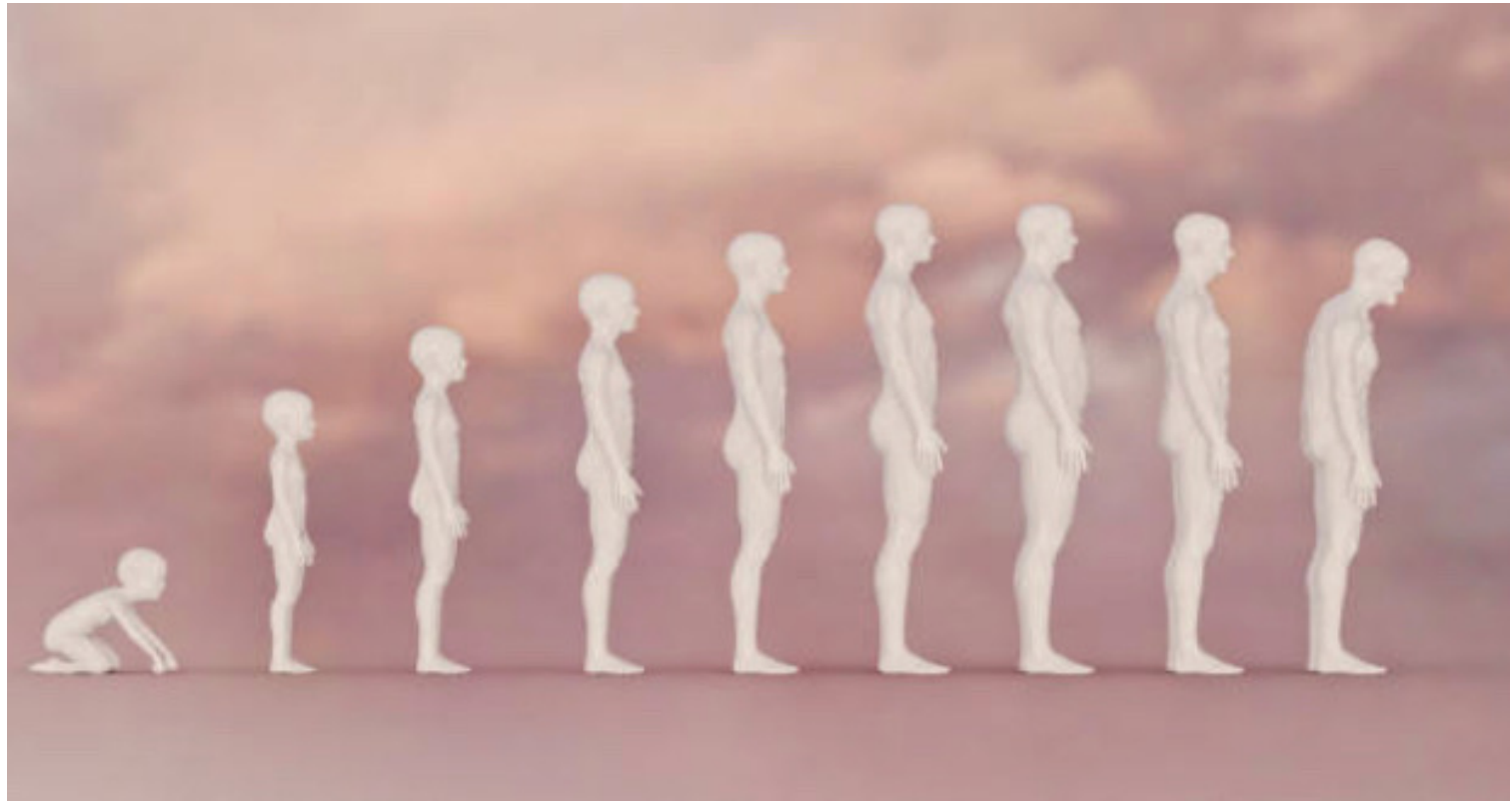


HUMAN BODY'S POWER ENGINE

- Healthy nerve cells produce new mitochondria
- Reduce in mitochondrial number, and insufficient ATP will lead to development of Alzheimer's and Parkinson's disease

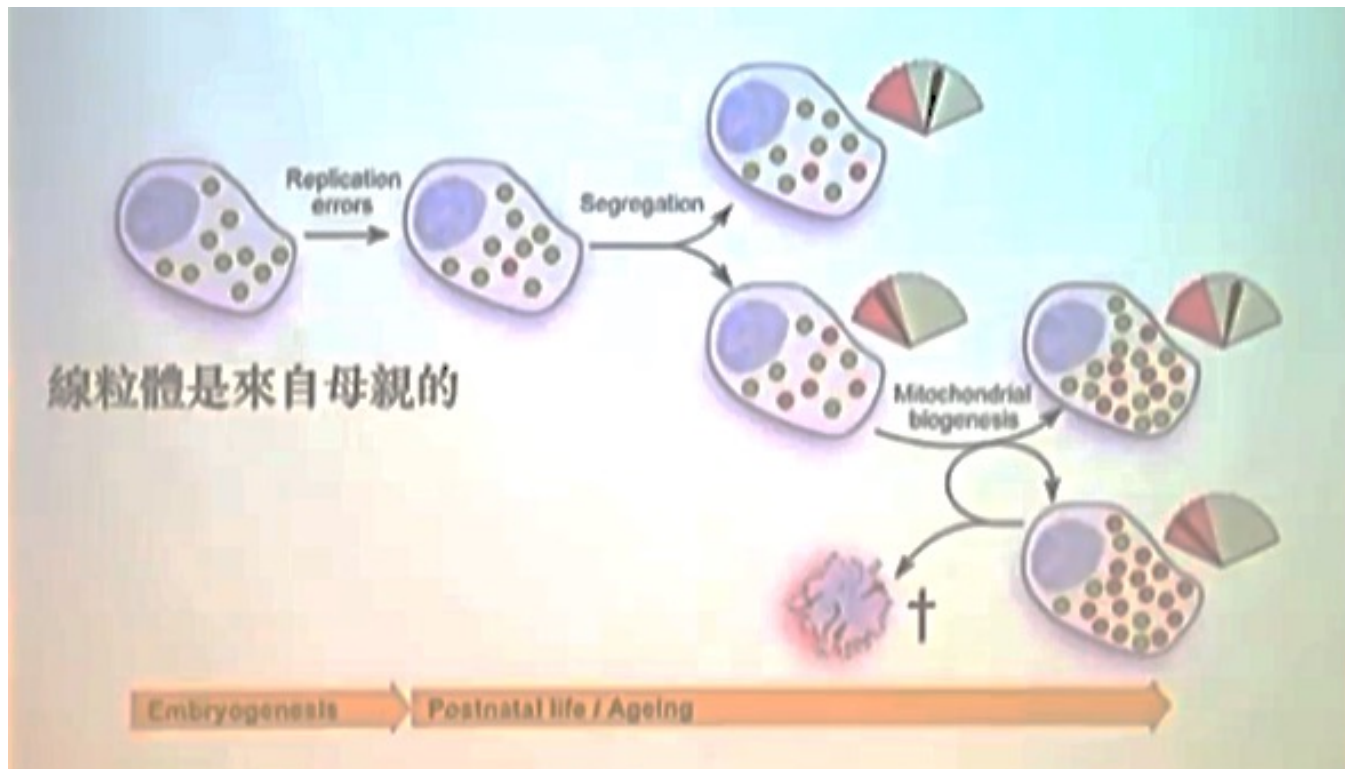


AGING/SENESCENCE



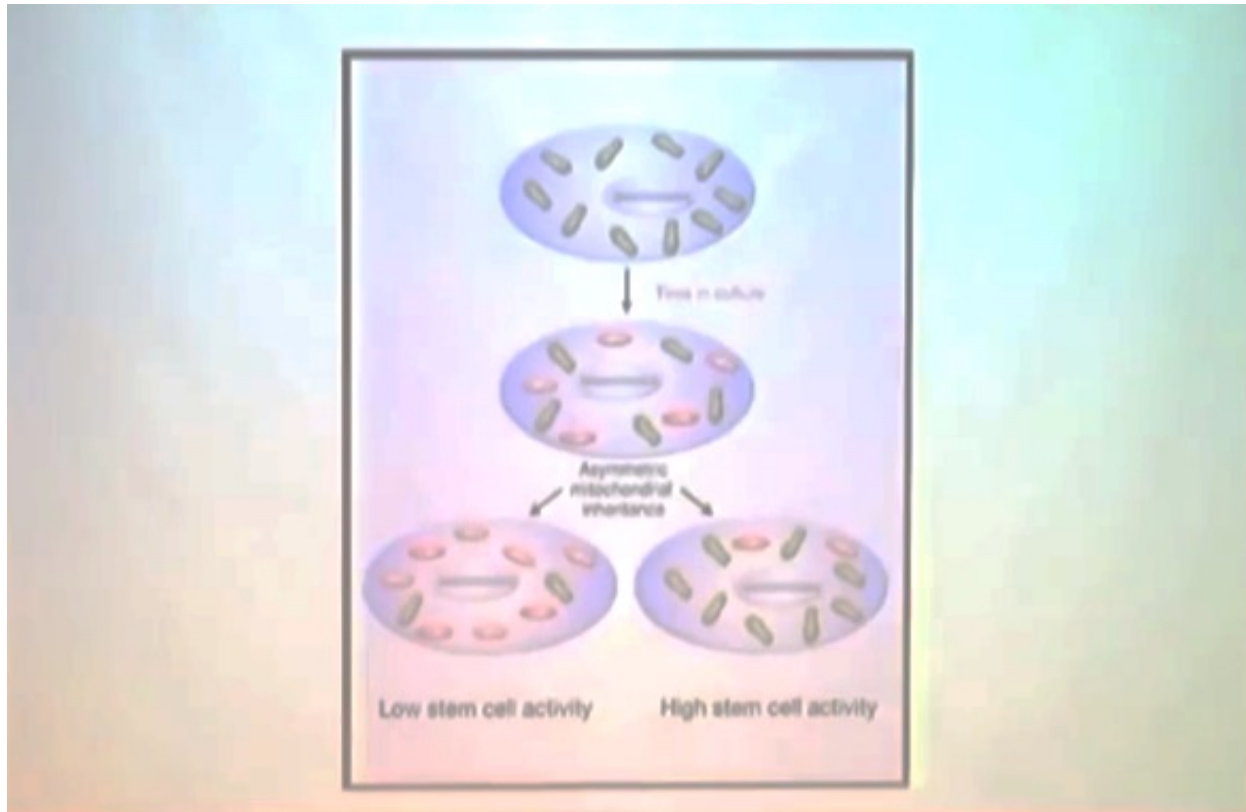
AGING/SENESCENCE

- Mitochondria are from the mother
- The number of mitochondria decreases with age



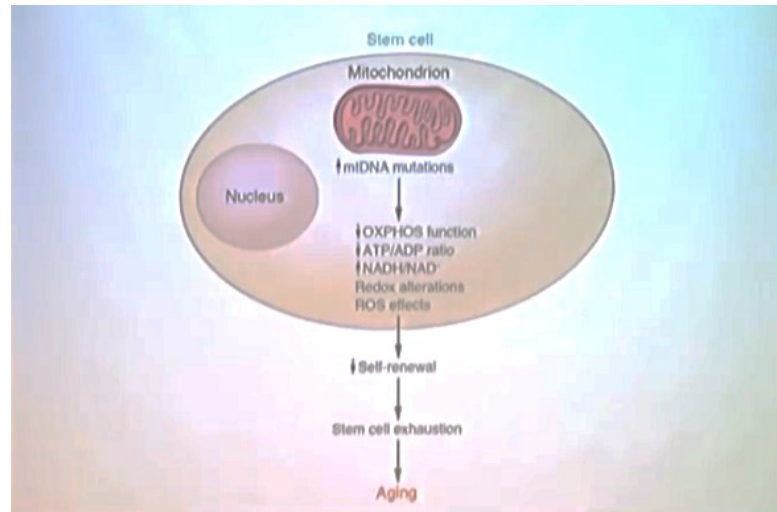
AGING/SENESCENCE

The number and performance of mitochondria affect the function of stem cells



AGING/SENESCENCE

Mitochondrial destruction is the main cause of aging



The **mtDNA** are subject to damage from reactive oxygen molecules released as a byproduct during cells use enzymes to oxidize nutrients. In addition, the **mtDNA** also lacks the DNA repair mechanisms found in the nucleus. The hallmark symptoms of mitochondrial myopathy include muscle weakness, exercise intolerance, impaired hearing and vision, ataxia, seizures, learning disabilities, heart defects, diabetes, and poor growth – none of which are unique to mitochondrial disease.

AGING/SENESCENCE

Mitochondrial dysfunction

線粒體失調

Proteostatic dysfunction

蛋白質處理失調

Nutrient signaling dysfunction

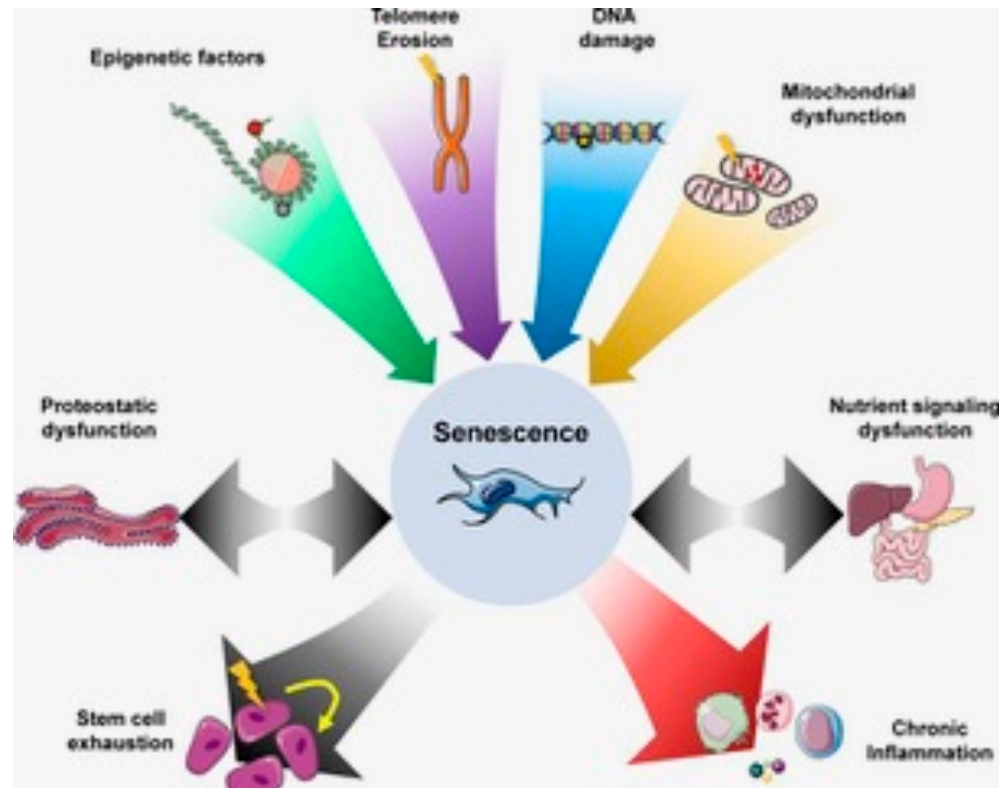
營養處理失調

Stem-cell exhaustion

幹細胞減退

Chronic inflammation

長期性發炎

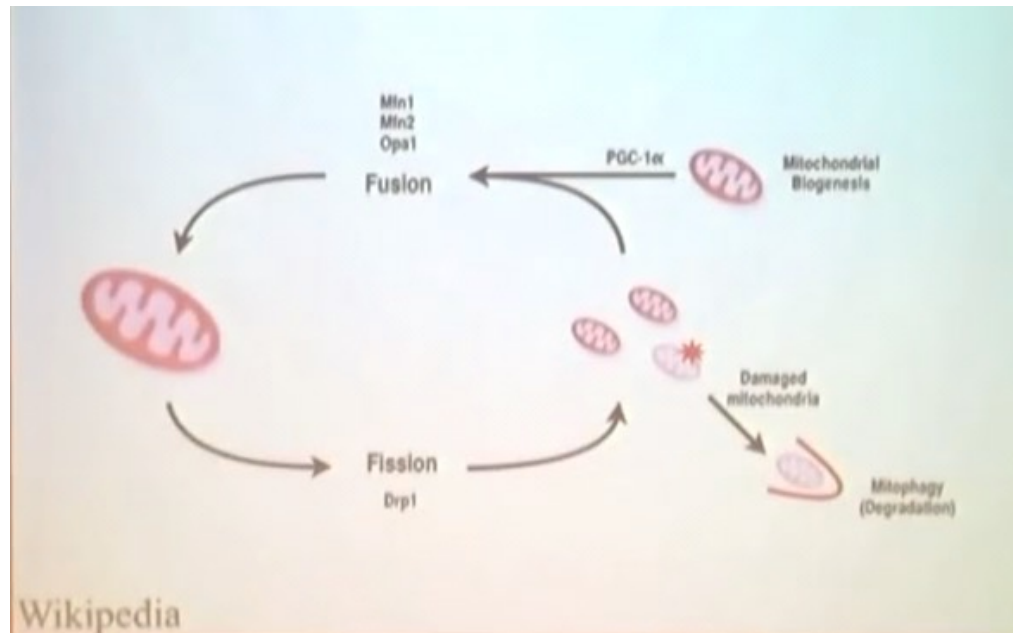


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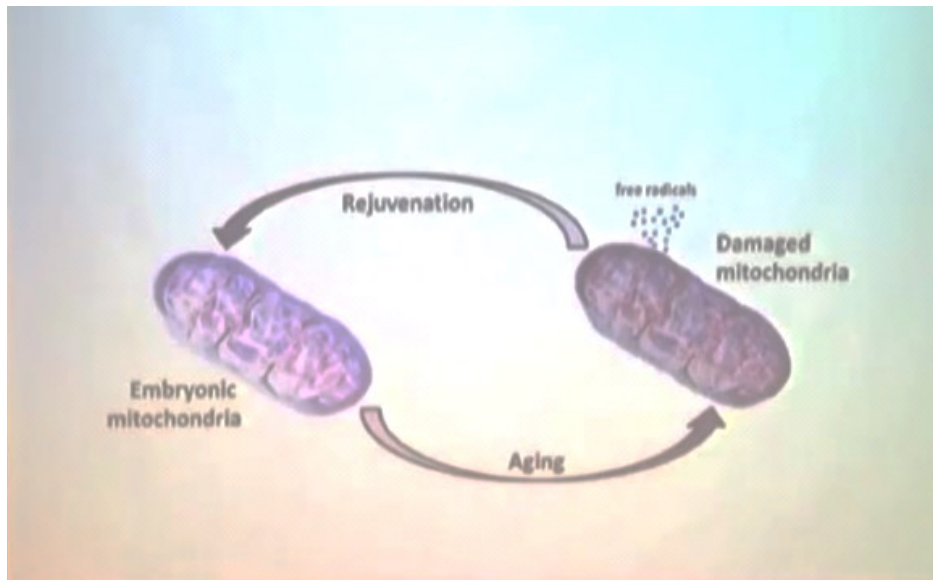
How to maintain the number and performance of mitochondria?



Both **fission and fusion** are nuclear reactions that produce energy, but the applications are not the same. **Fission** is the splitting of a heavy, unstable nucleus into two lighter nuclei, and **fusion** is the process where two light nuclei combine together releasing vast amounts of energy.

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How to improve the function of mitochondria?



A **free radical** can be defined as any molecular species capable of independent existence that contains an unpaired electron in an atomic orbital. **Free radicals** are unstable atoms. As the body ages, it loses its ability to fight the effects of **free radicals**. The result is more **free radicals**, more **oxidative stress**, and more damage to cells, which leads to degenerative processes, as well as "normal" aging.

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Autophagy is the process of 'self-eating' of damaged cells so as to keep the mitochondria healthy;

As we age, or even as we're young, proteins and DNA become damaged and they turn over, so we need very healthy proteins and peptides (chains of amino acids) and DNA and RNA. Due to variety of stresses, from **oxidative stress** (imbalance between pro-oxidants/free radicals and antioxidants) to **glycated haemoglobin** (increased HbA1c), reactive nitrogen species (RNS) etc., different forms of stresses can damage those proteins and peptides. We therefore need to remove them quickly to get new healthy on in place of those, so we can optimally function in the cell;

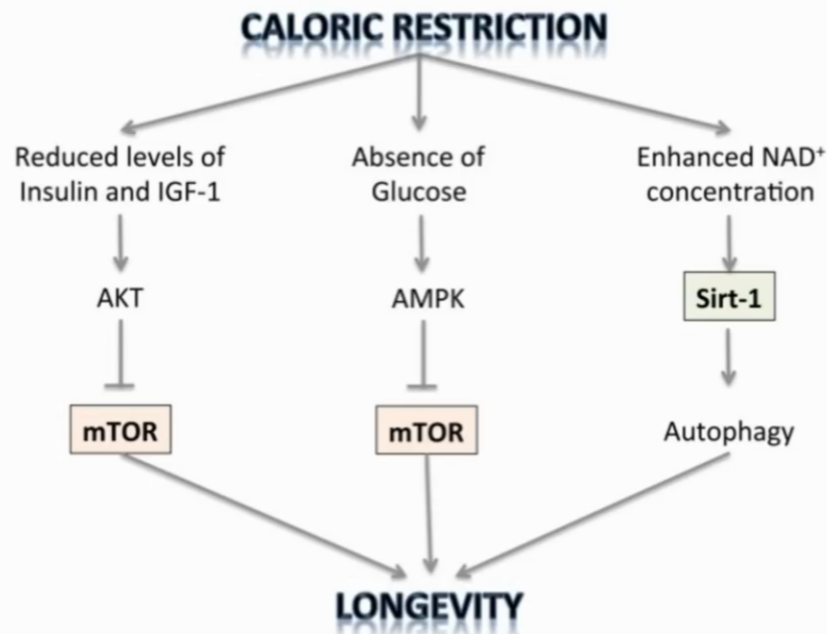
With **exercise** or **reducing the calories**, the autophagy process will be turned on, and help again the cell to recycle and to repair, and become healthier and more resistant against stress.



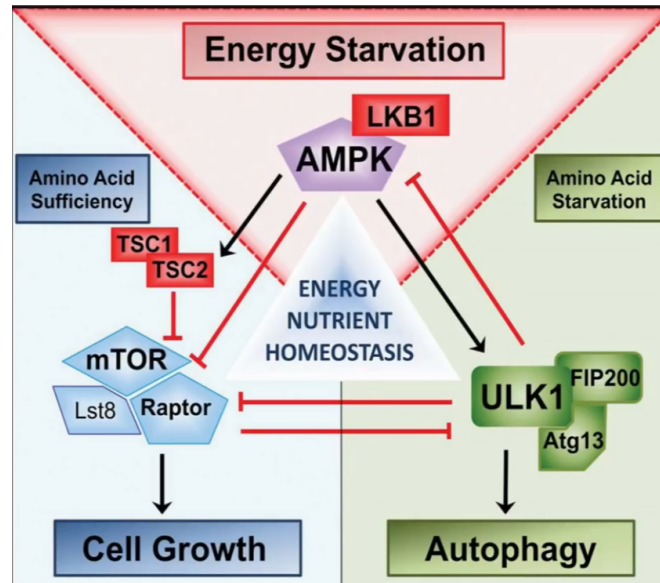
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Sirtuins (Sirt-1) are a family of proteins. And there's many of them that have a wide variety of functions to tell genes to wake up and to activate, and make certain protective proteins to further help and **protect the cells**. So they are central, they are like a master gene of aging, to keep a cell very healthy and optimizing. But again, it's a signaling protein that helps to generate other proteins that are important for health.

The **mammalian target of rapamycin (mTOR)** signaling pathway is a master regulator of **cell growth and metabolism**. **Raptor** is regulatory associated protein of mTOR, and deregulation of the mTOR pathway has been implicated in a number of human diseases such as cancer, diabetes, obesity, neurological diseases and genetic disorders.



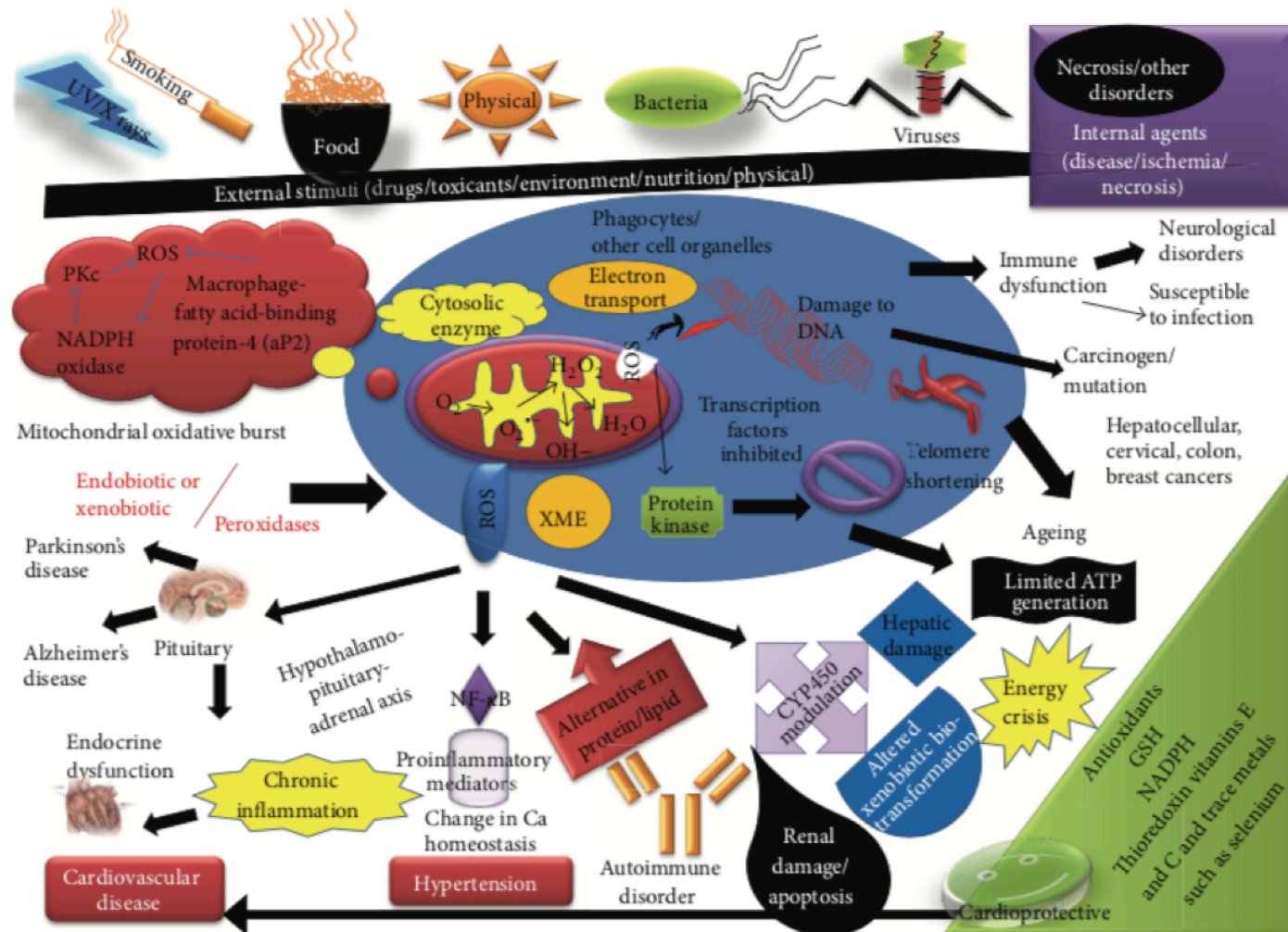
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Increased **AMPK** activation has been shown to help reduce fat storage (especially dangerous belly fat), increase insulin sensitivity (to lower blood glucose), reduce cholesterol/triglyceride production, and suppress chronic inflammation. Cells activate AMPK when they are running low on energy, and AMPK is activated in tissues throughout the body following [exercise](#) or during [caloric restriction](#). In response, AMPK alters the activity of many other genes and proteins, helping keep cells alive and functioning even when they're running low on fuel

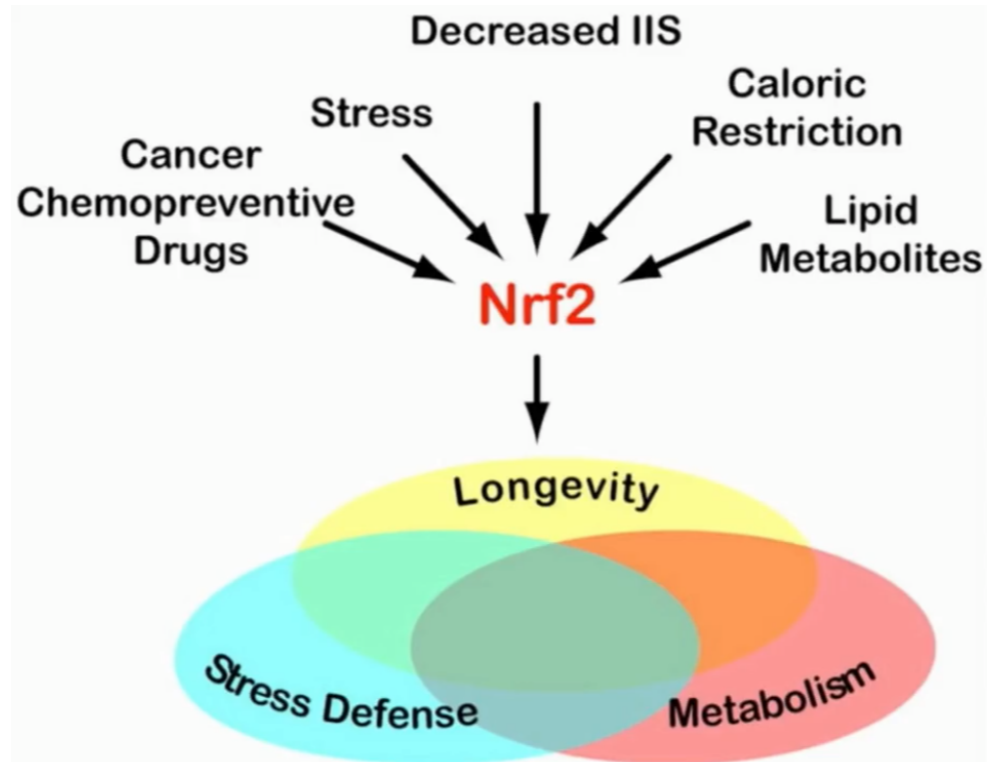
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Oxidative stress and disease development (source: BioMed Research International)



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Nrf2 is a basic bZIP protein that regulates the expression of antioxidant proteins that protect against oxidative damage triggered by injury and inflammation.



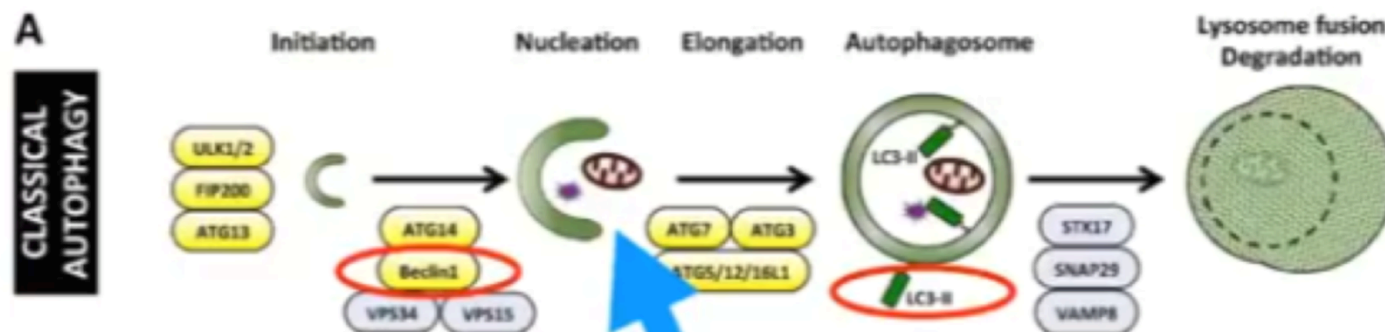
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Activators:

High AMP/ATP ratio (AMPK)
 Calorie restriction
 Low-glucose/Insulin high Glucagon
 Cortisol | Thyroid Hormone
 Circadian rhythm entrainment
 Skeletal muscle contractions
 Rapamycin | Berberine | Metformin | Spermidine
 Lithium | Resveratrol

Inhibitors:

mTOR
 IGF-1/growth factors
 High-glucose
 Amino acids
 Energy excess



Cargo:

Protein aggregates
 Mitochondria
 Defective cellular organelles
 Glycogen
 Lipids

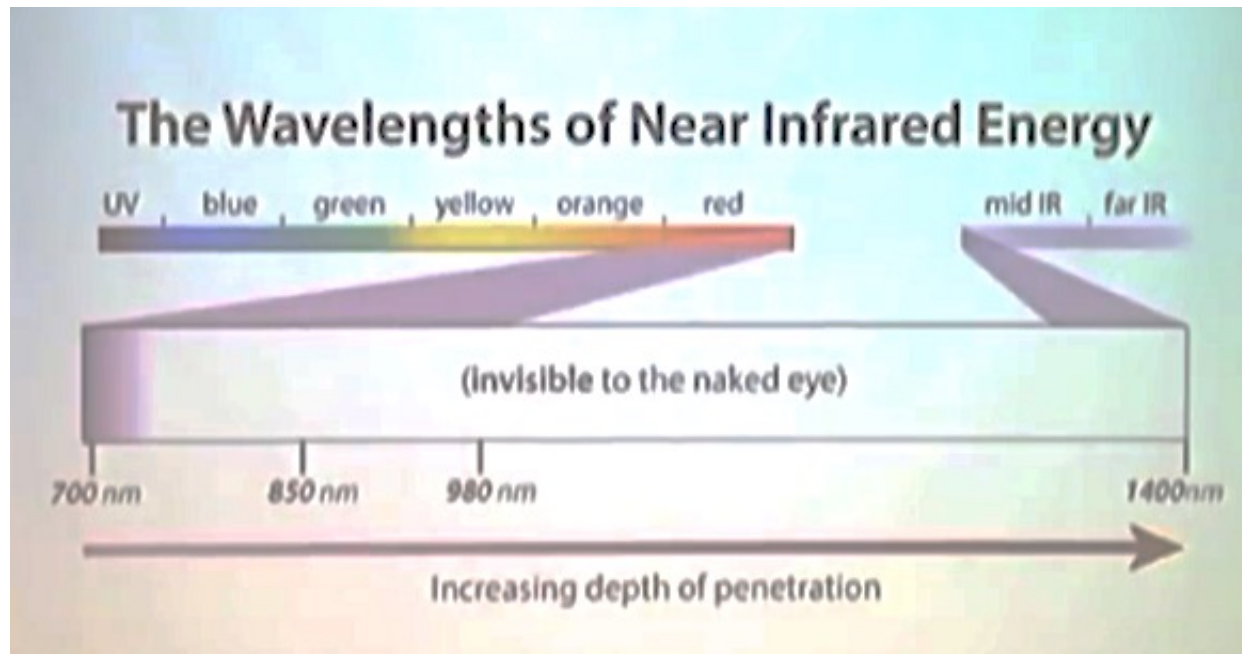
Cadwell, K., & Debnath, J. (2018). Beyond self-eating: The control of nonautophagic functions and signaling pathways by autophagy-related proteins. *The Journal of Cell Biology*, 217(3), 813–822. <http://doi.org/10.1083/jcb.201706157>

ANTI-AGING : Near Infrared Energy



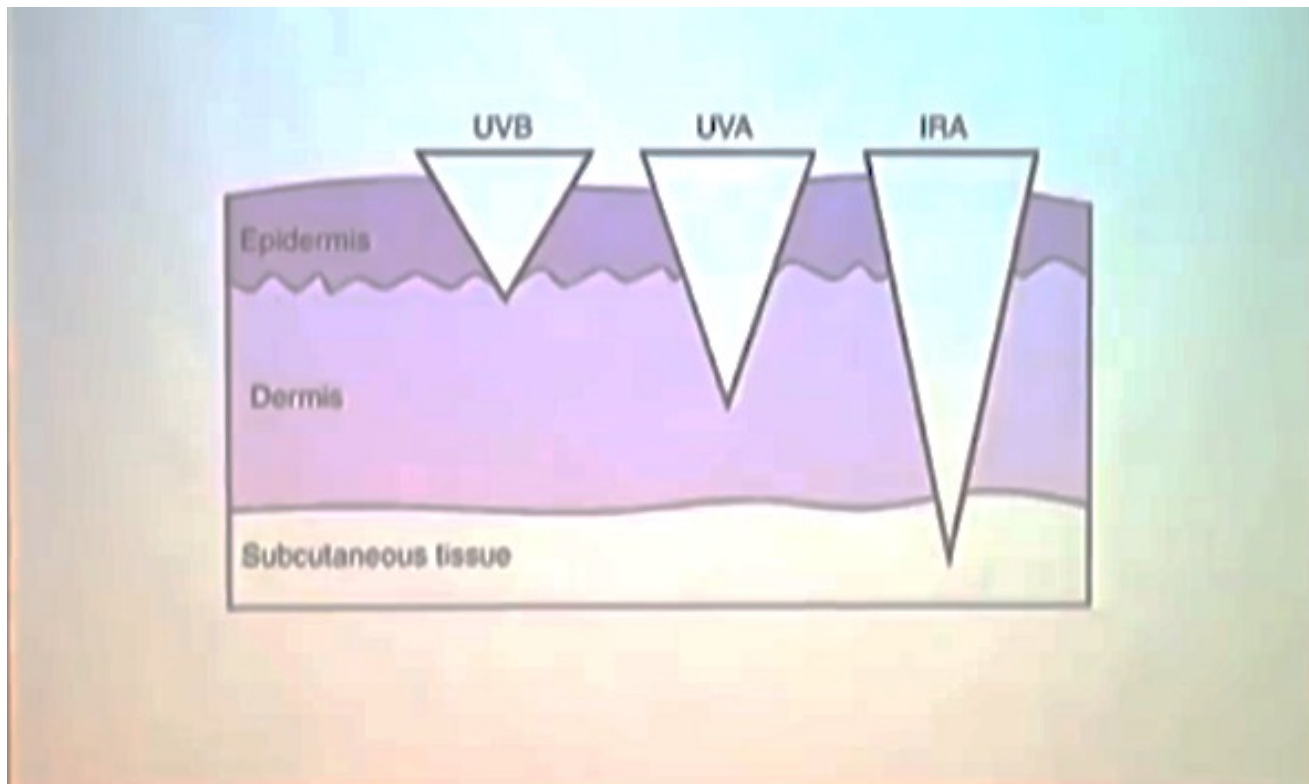
ANTI-AGING : Near Infrared Energy

- Natural light is full spectrum
- Indoor light is only blue light



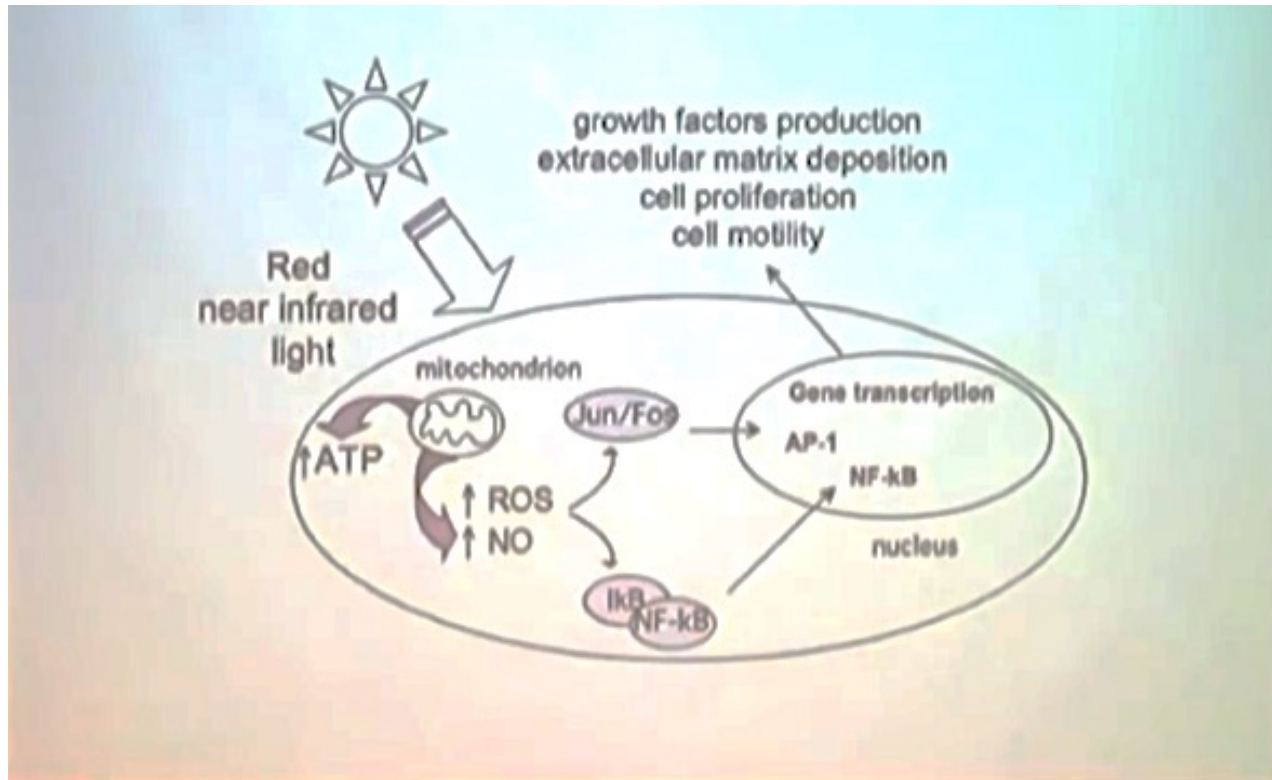
ANTI-AGING : Near Infrared Energy

- We need UVB and IRA
- UVB + Vitamin D -> active Vitamin D to fight disease, reduce depression and boost weight loss
- UVA will change DNA and cause skin damage



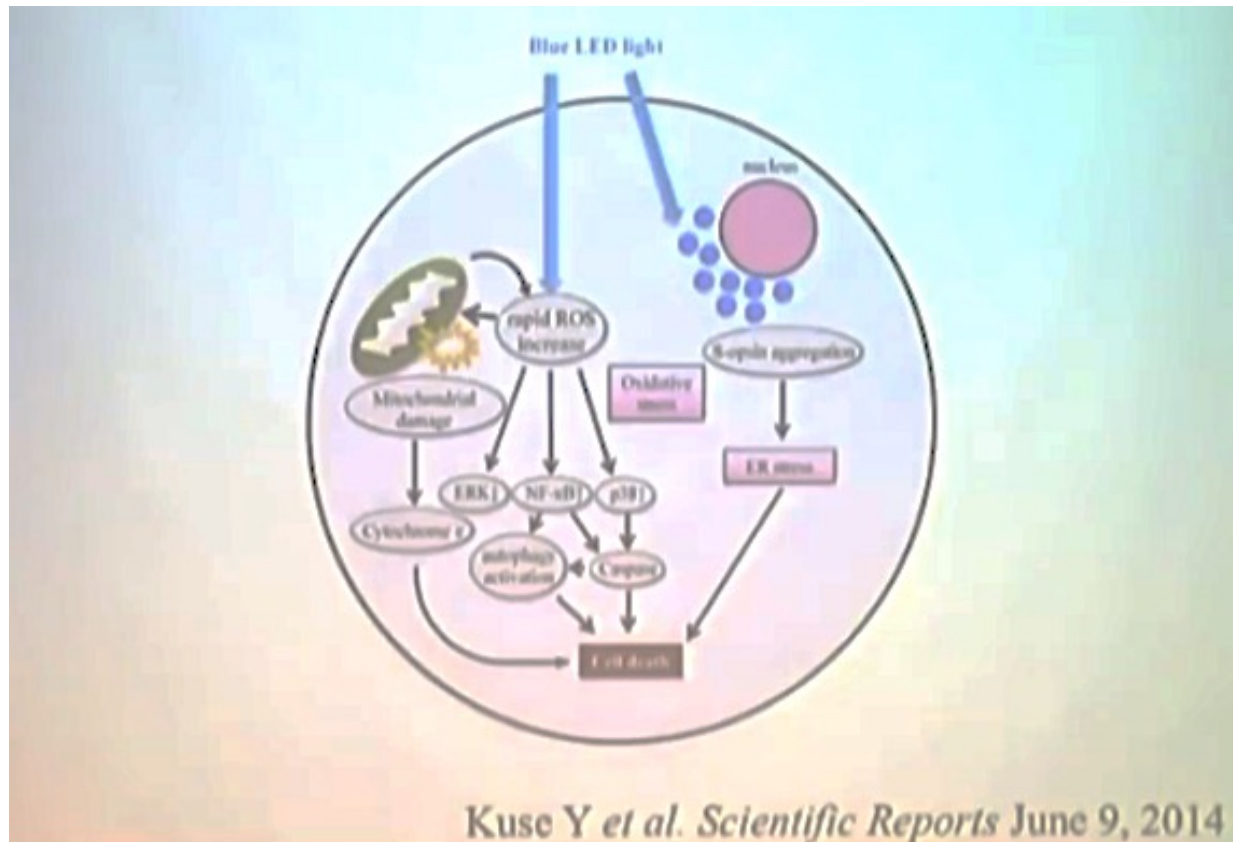
ANTI-AGING : Near Infrared Energy

Red light and near infrared light can enhance the function of mitochondria



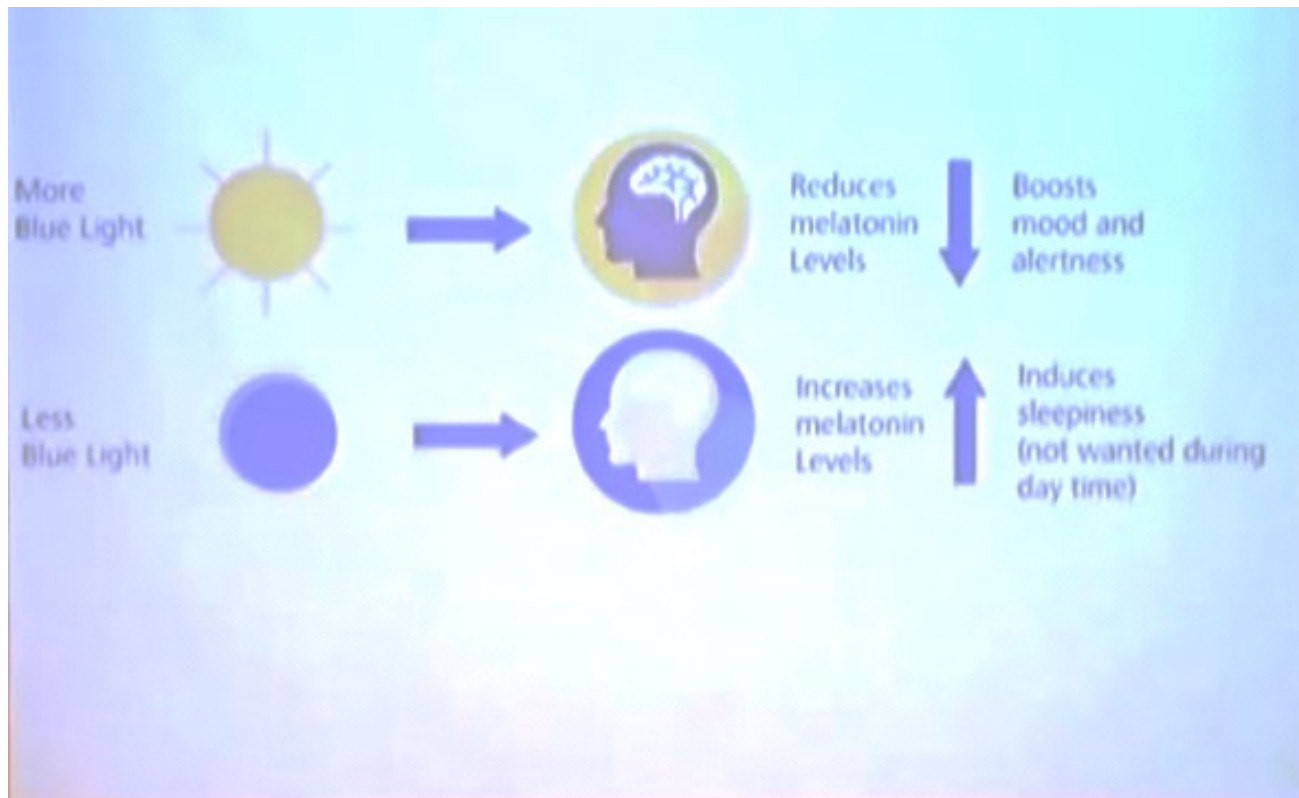
ANTI-AGING : Near Infrared Energy

Blue light destroy mitochondria



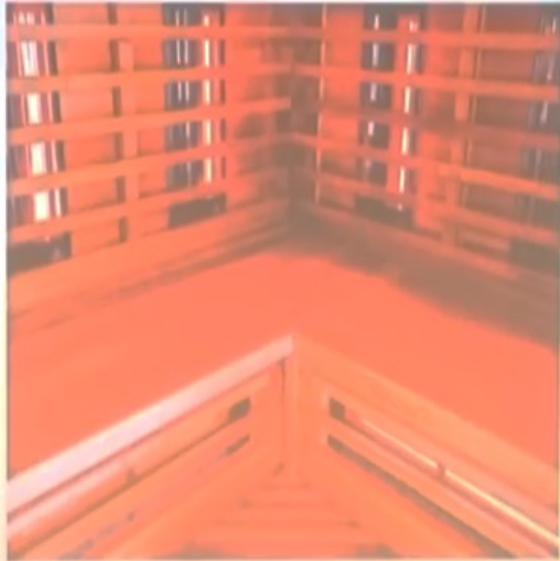
ANTI-AGING : Near Infrared Energy

Natural light is very important to reduce melatonin levels in the day time to boost mood and alertness



ANTI-AGING : Near Infrared Energy

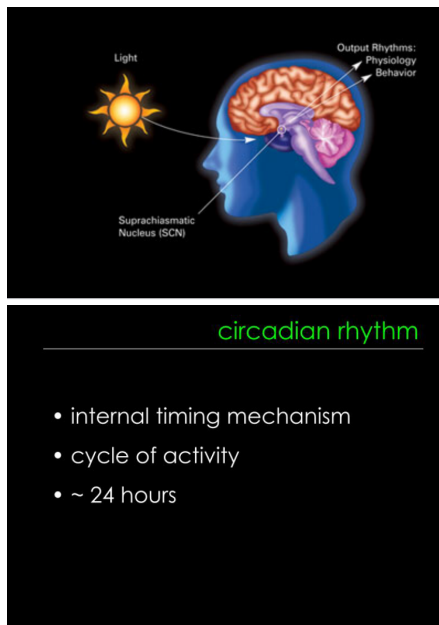
Infrared sauna (紅外線桑拿)



Natural light therapy (自然光線療法)



ANTI-AGING : Circadian Rhythm Entrainment



➤ **Suprachiasmatic nucleus: the brain's circadian clock**

- The suprachiasmatic nucleus or nuclei (SCN) is a tiny region of the brain in hypothalamus, it is responsible for controlling circadian rhythms.



Pineal gland – Red

Paraventricular
Nucleus – Yellow

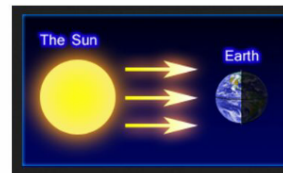
Suprachiasmatic
nucleus – Green

ANTI-AGING : Circadian Rhythm Entrainment

**The 2017
Nobel Prize
in Physiology
or Medicine**

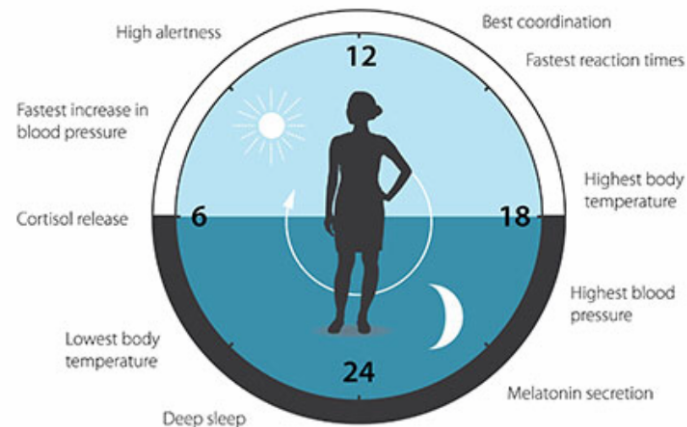
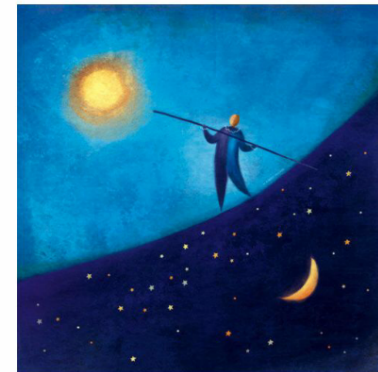
**Circadian
rhythm and
its molecular
mechanisms**

CIRCADIAN RHYTHMS

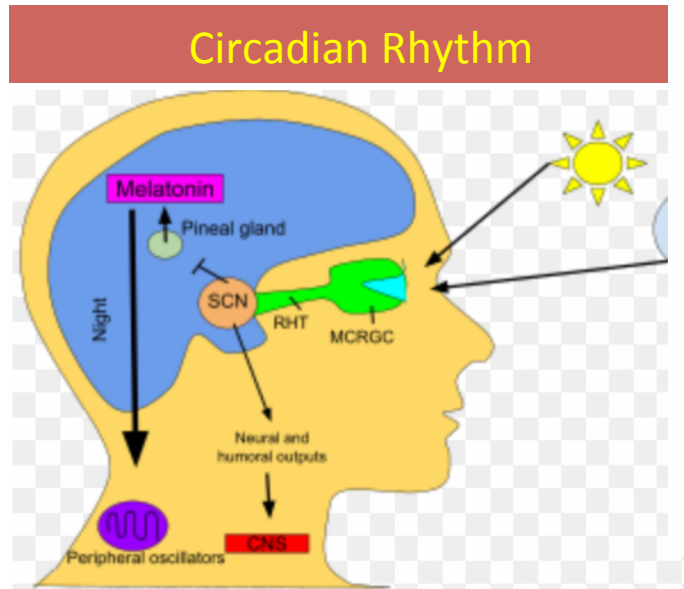


<http://www.bobthealien.co.uk/daynight.png>

<http://www.quantumdiaries.org/wp-content/uploads/2011/04/robert-weigand-night-and-day.jpg>



ANTI-AGING : Circadian Rhythm Entrainment



Properties of circadian rhythms

- They are genetic in origin.
- They are controlled by biological clocks.
- The biological clocks are reset and calibrated by periodic environmental signals (called synchronizers or Zeitgebers or entraining agents).
- There are often cycles within cycles, their intensity and frequency varying in different parts of the activity period.

THE TICKING OF THE BIOLOGICAL CLOCK

Suprachiasmatic Nucleus (SCN)

The basis of the circadian rhythm lies in interactions between certain **proteins**, creating the 'tick' of the biological clock; it is an ingenious **negative feedback loop**.

In humans the main pairs are **CLOCK-BMAL1** and **PER-CRY** (BMAL1 and CRY are also proteins).

This protein mechanism is present in the **SCN** (the central oscillator), and is also present in cells throughout the body (peripheral oscillators).

The presence of peripheral oscillators explains why there are different rhythms for different functions such as hormone secretion, urine production, blood circulation and so on.

Biological clock

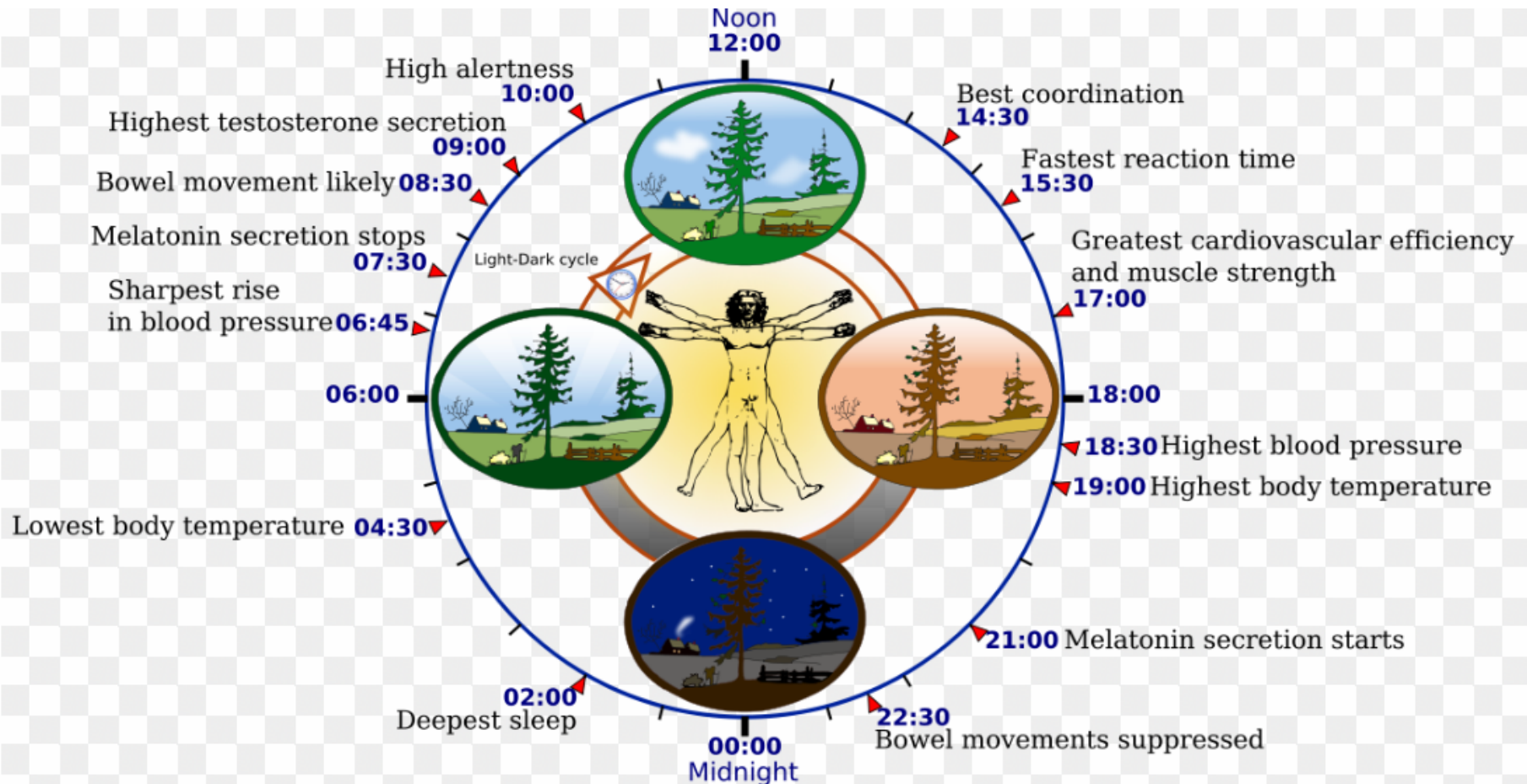
An innate mechanism in living organisms that controls the periodicity or rhythm of various physiological functions or activities.

- Circadian rhythm
 - Circadian: circa(around)+dies(day)
- Ultradian rhythm
- Infradian rhythm

Internal biological clock + change of environment

↓
Reset / entrainment mechanism

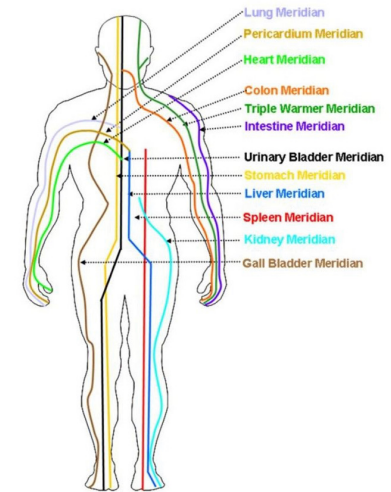
ANTI-AGING : Circadian Rhythm Entrainment



ANTI-AGING : Circadian Rhythm Entrainment

TCM Twelve Meridian Pathway 十二經絡

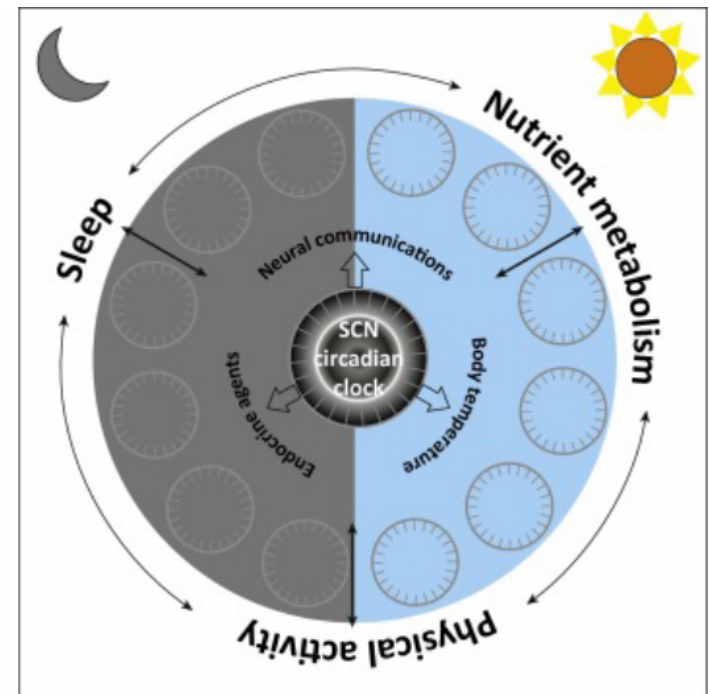
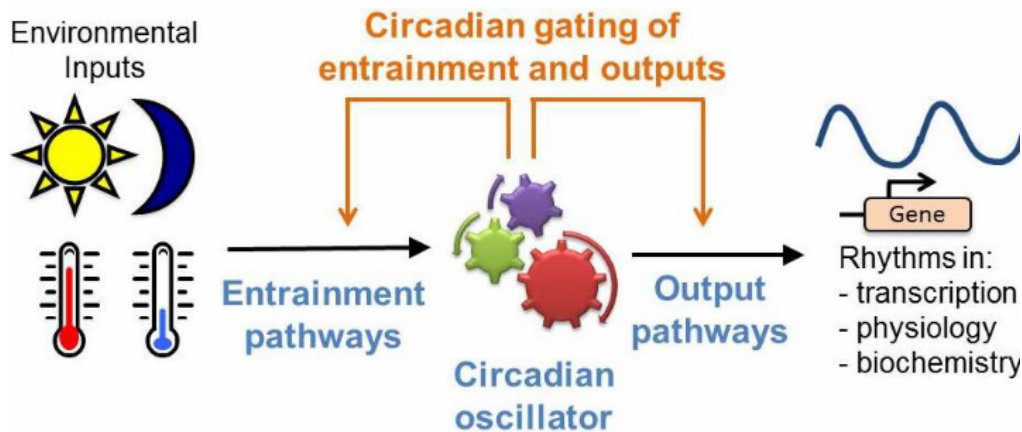
HOUR	MERIDIAN PATHWAY	FIVE ELEMENT	FUNCTION
2300-0100	Gall Bladder (膽)	Wood 木	store and release bile, control sinews
0100-0300	Liver (肝)	Wood 木	store blood, control sinews, produce nails, regulate the eyes
0300-0500	Lung (肺)	Metal 金	control blood vessels, circulate blood, descends fluids, control the skin, regulate the nose, govern voice
0500-0700	Large Intestine (大腸)	Metal 金	absorb fluid, eliminate impure
0700-0900	Stomach (胃)	Earth 土	receive food and drink, digest foods, generate fluids
0900-1100	Spleen (脾)	Earth 土	control blood, nourish muscles, moisten tissues, govern taste, regulate rhythms
1100-1300	Heart (心)	Fire 火	control sleep, control sweat, control touch, control heat
1300-1500	Small Intestine (小腸)	Fire 火	receive food and drink
1500-1700	Bladder (膀胱)	Water 水	store urine, clear water, release the impair
1700-1900	Kidney (腎)	Water 水	produce marrow, generate fear, control knees, help the lungs inhale, govern the ears and hearing, control hair, control lower orifices, control fertility, govern memory
1900-2100	Pericardium (心包)	Fire 火	protect the heart
2100-2300	Triple Heater (三焦)	Fire 火	govern water passage, transform fluids, balance upper and lower body, facilitate digestion



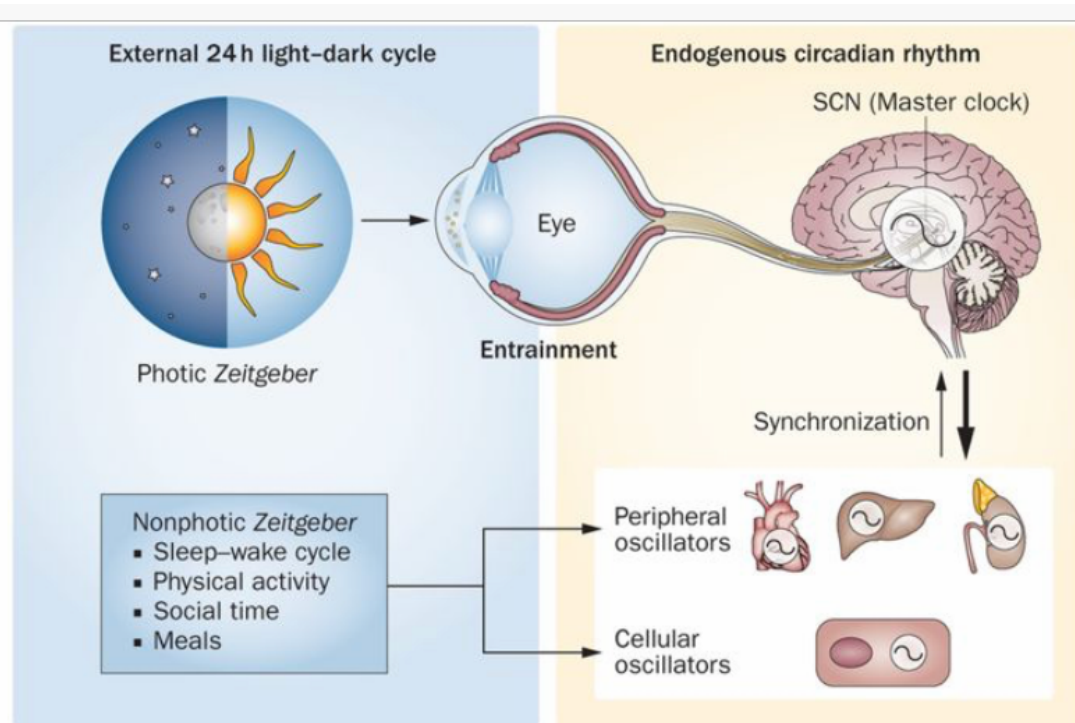
12 PRIMARY MERIDIANS

ANTI-AGING : Circadian Rhythm Entrainment

Interconnected parts of the circadian system

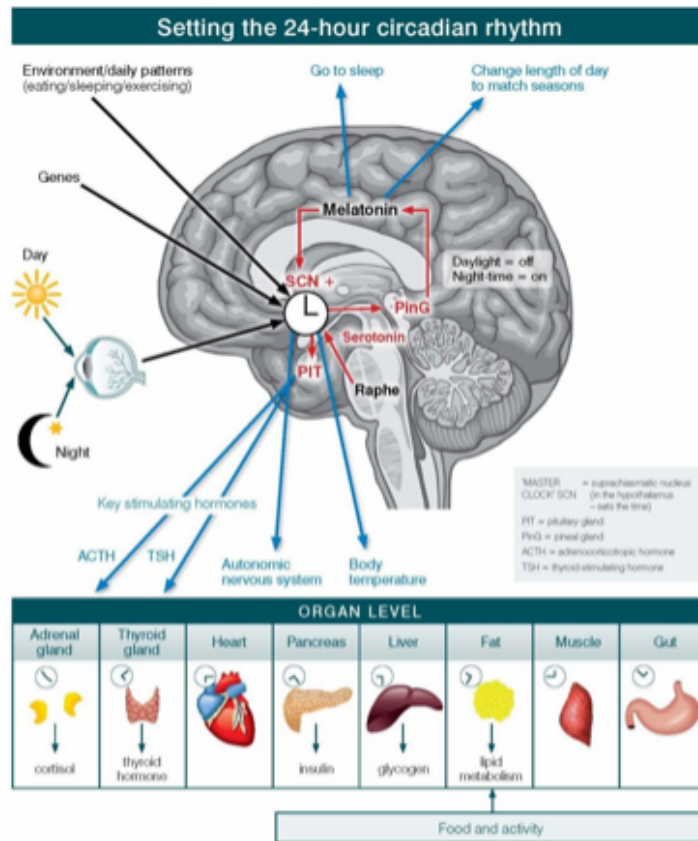


ANTI-AGING : Circadian Rhythm Entrainment



Nature Reviews | Rheumatology

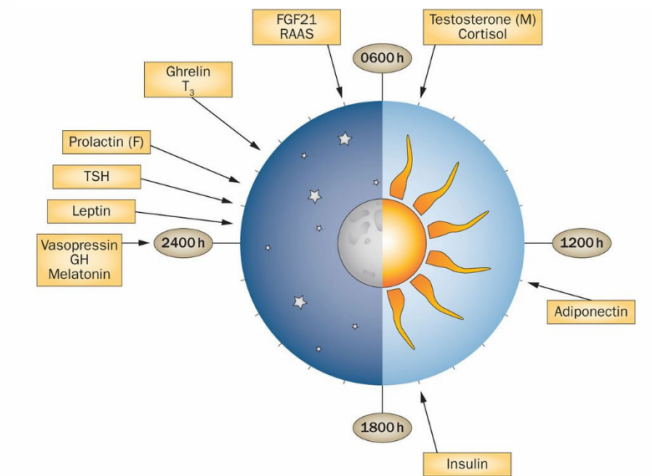
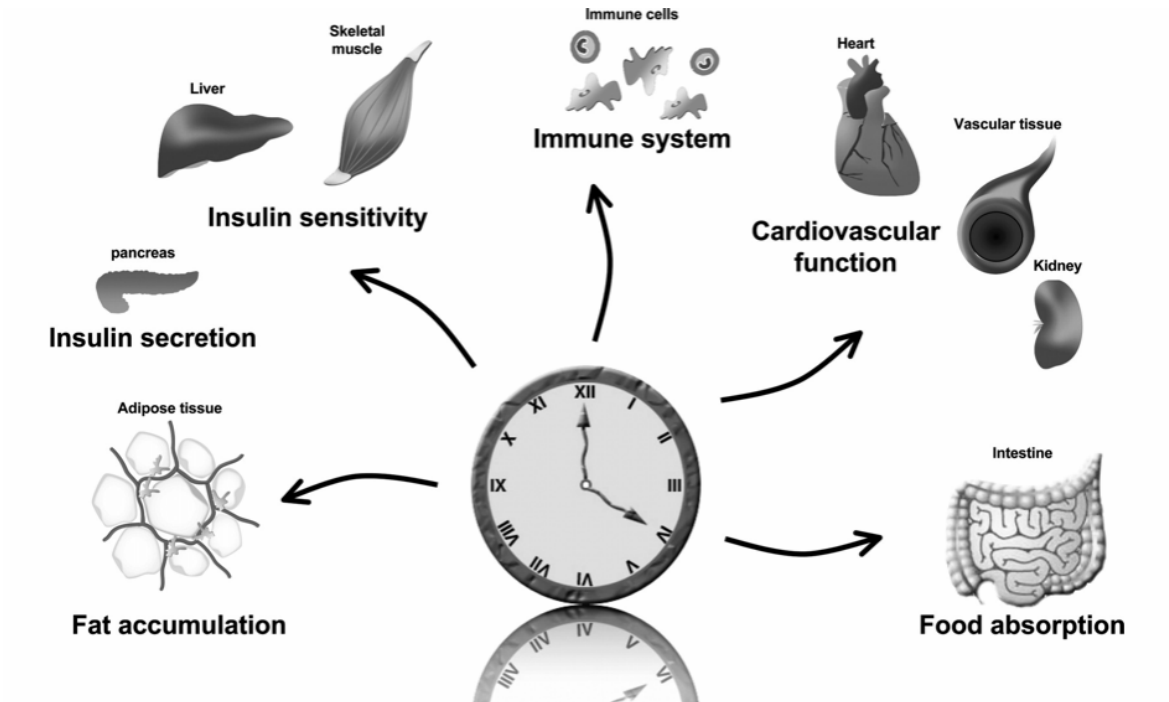
ANTI-AGING : Circadian Rhythm Entrainment



DAY	NIGHT
MUSCLE	MUSCLE
Fatty acid uptake (脂肪酸攝取)	Cortisol metabolism (皮質醇代謝)
Glycolytic metabolism (糖酵解代謝)	
FAT	FAT
Lipogenesis (脂肪生成)	Lipid catabolism (油脂分解代謝)
Adiponectin production (脂締素生成)	Leptin secretion (瘦蛋白分泌)
LIVER	LIVER
Glycogen synthesis (糖原合成)	Gluconeogenesis (糖異生)
Cholesterol synthesis (膽固醇合成)	Glycogenesis (肝醣合成)
Bile acid synthesis (膽汁酸合成)	Mitochondrial biogenesis (線粒體生源)
PANCREAS	PANCREAS
Insulin secretion (胰島素分泌)	Glucagon secretion (胰高血糖素分泌)

ANTI-AGING : Circadian Rhythm Entrainment

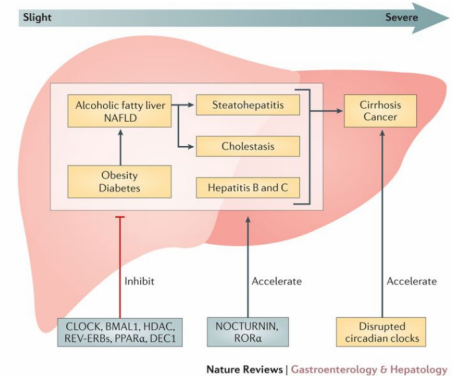
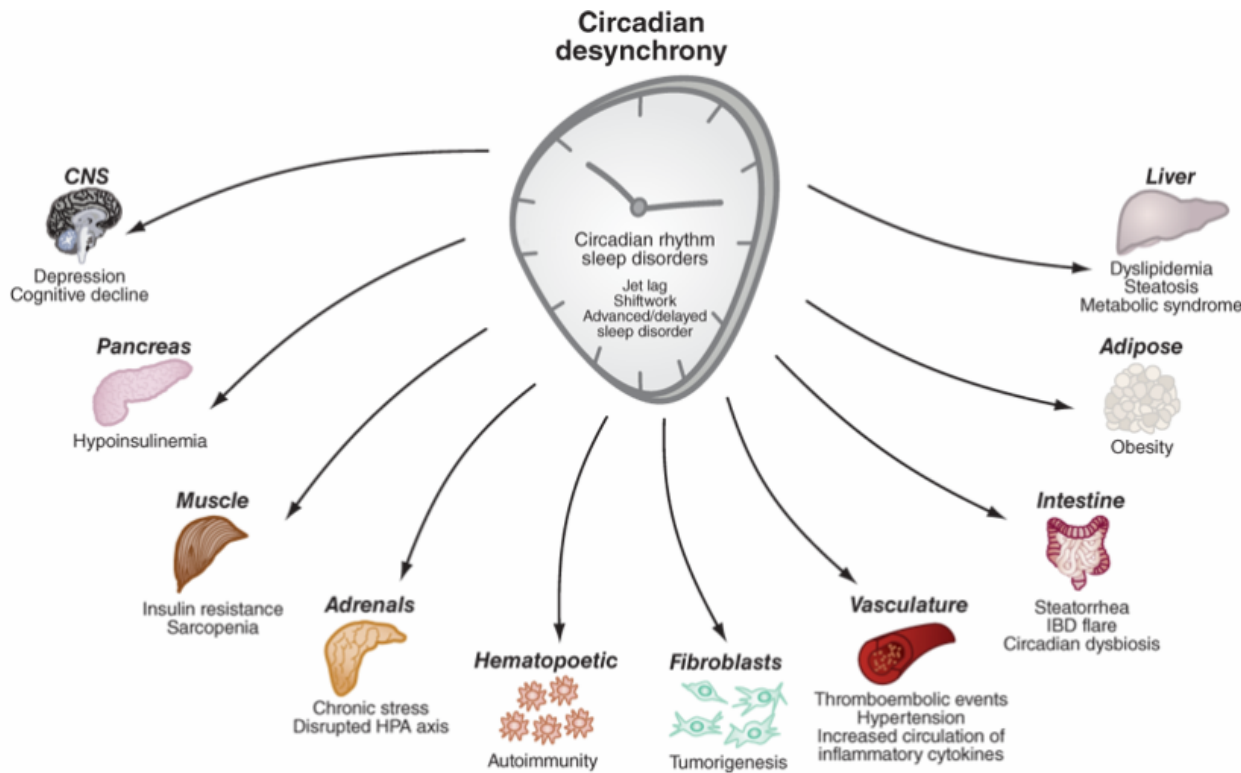
Circadian Rhythms and Metabolic Syndrome



Circadian clock control of
endocrine factors

ANTI-AGING : Circadian Rhythm Entrainment

The Role of Circadian Biology in Health and Disease

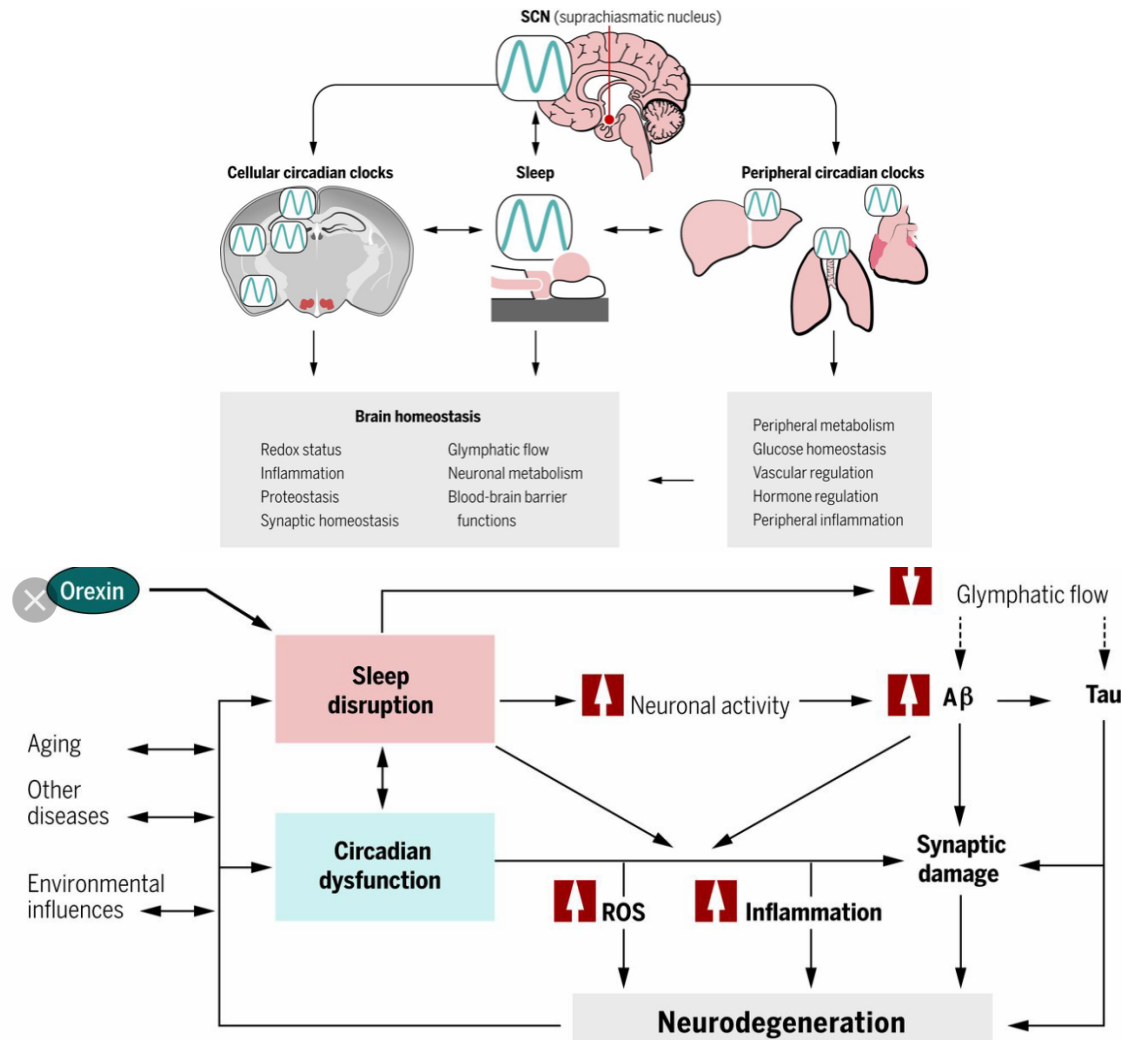


Source: J.L. Jameson, A.S. Fauci, D.L. Kasper, S.L. Hauser, D.L. Longo, J. Loscalzo: Harrison's Principles of Internal Medicine, 20th Edition Copyright © McGraw-Hill Education. All rights reserved.











ANTI-AGING : Circadian Rhythm

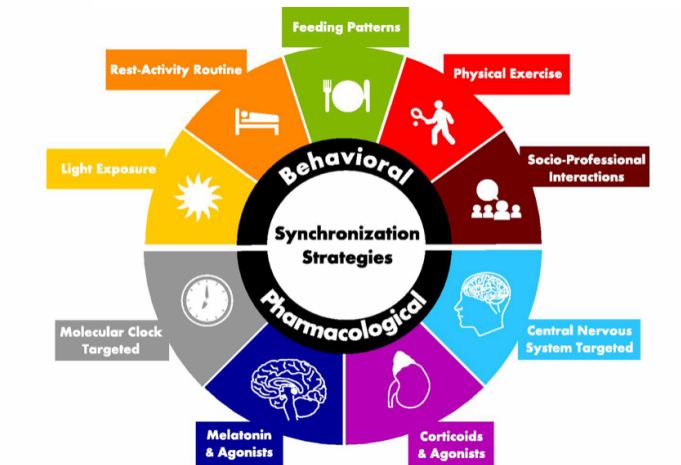
Entrainment

Mechanisms linking circadian clocks, sleep, and neurodegeneration



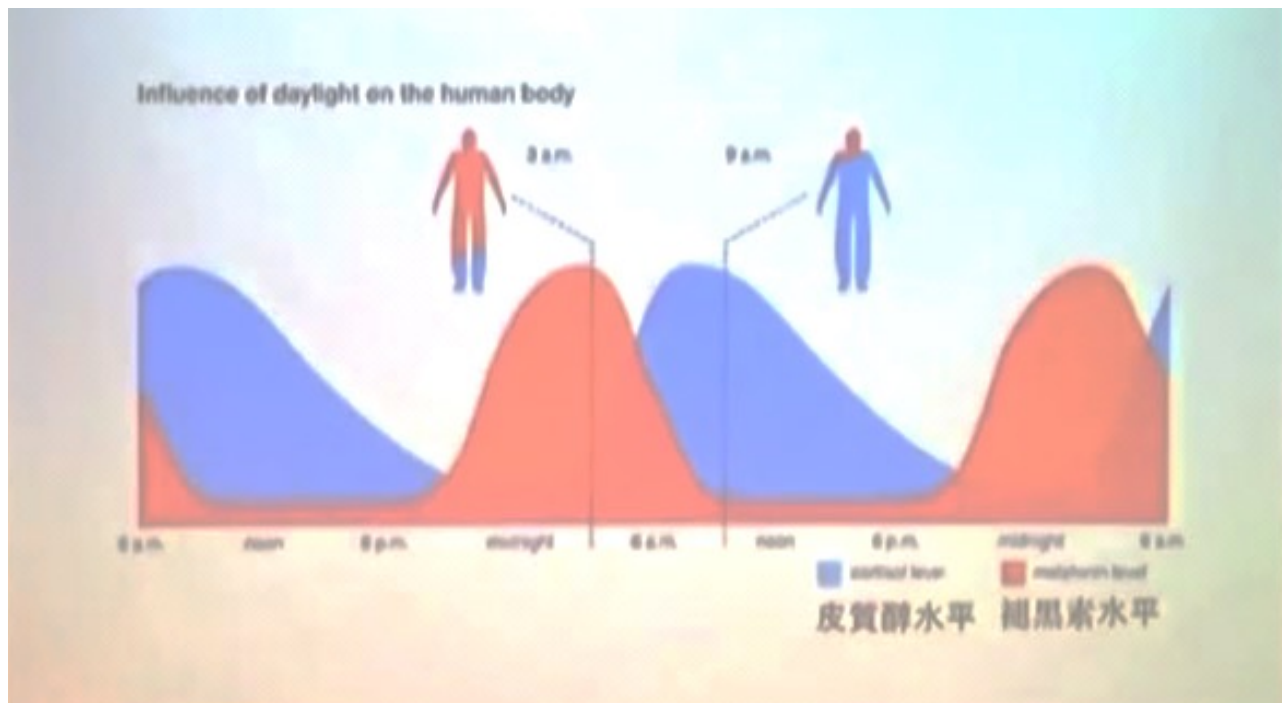
ANTI-AGING : Circadian Rhythm Entrainment

Circadian rhythm disruption or DIO	Time-restricted feeding	Potential mechanism
 Obesity	↓ Fat, ↑ lean mass	↓ Plasma- and ↓ liver-triglycerides
 Glucose intolerance/insulin resistance	Improved glucose homeostasis	↓ Gluconeogenesis ↑ PPP and ↑ TCA cycle
 Gut dysbiosis	Diverse and dynamic	Altered digestion, absorption, and excretion of nutrients and bile acids
 Cardiovascular diseases	Arrhythmia and improved ↓ cardiac function*	ATP-dependent chaperone and improved mitochondria function
 Chronic inflammation	↓ Tissue inflammation	↓ Macrophage infiltration of WAT ↓ IL6 TNF α
 Liver diseases	↓ Fibrosis and ↓ hepatic fat deposit	Fatty acid synthesis, ↑ β oxidation mitochondria volume
 Increased cancer risk	↓ Risk for breast cancer [#] and ↑ breast cancer prognosis	Improved metabolic homeostasis, reduced inflammation
 Hypercholesterolemia	↓ Cholesterol	Cholesterol metabolism to bile acids
 Sleep disorders	↑ Sleep quality [#] and ↑ quantity*	Consolidation of activity and rest
 Compromised muscle function	↑ Endurance and ↑ flight index*	Ketone bodies, creatine metabolism



ANTI-AGING : Circadian Rhythm Entrainment

Melatonin (褪黑素) is the byproduct of Serotonin (血清素), it is not only a sleeping hormone, but also an important antioxidant in the body

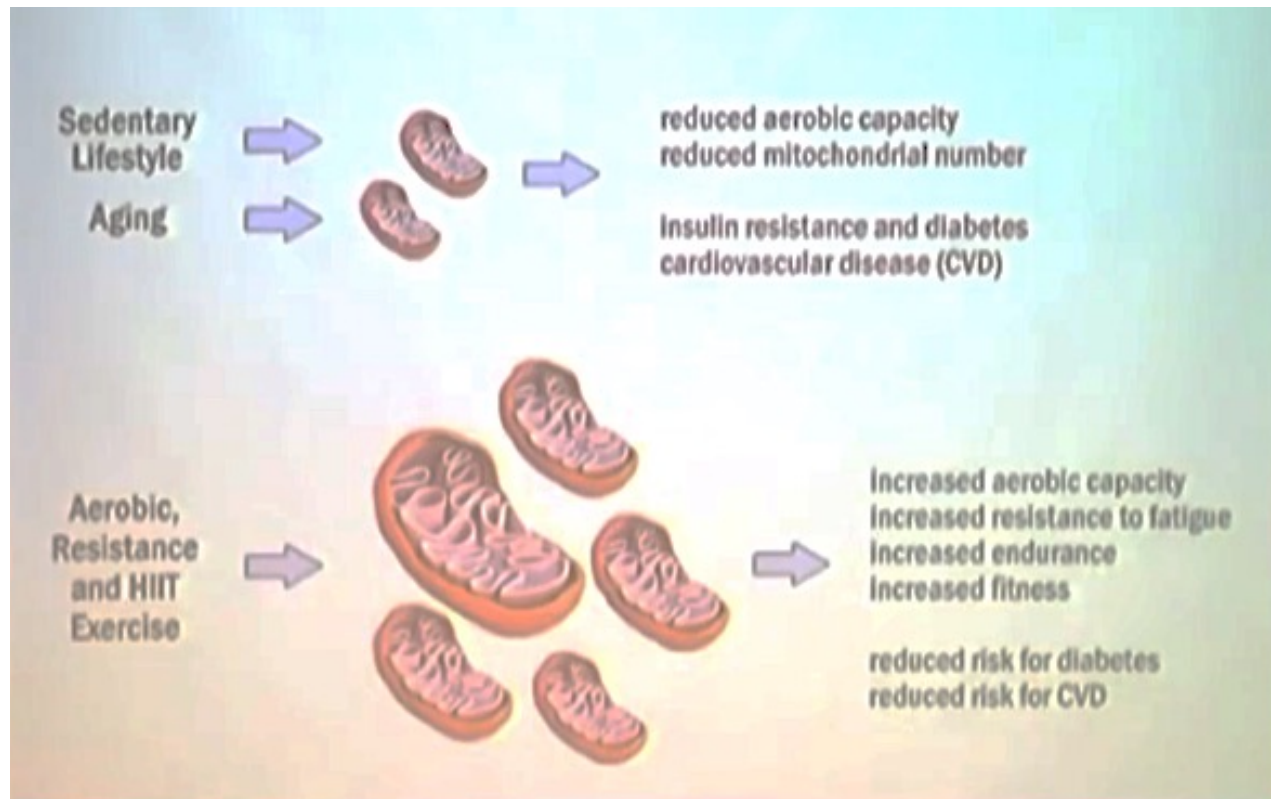


ANTI-AGING : Exercise



ANTI-AGING : Exercise

Aerobic, resistance exercise and QiGong can improve the function of mitochondria



ANTI-AGING : Exercise



WEIGHT TRAINING



BURNS CALORIES



BUILDS MUSCLE

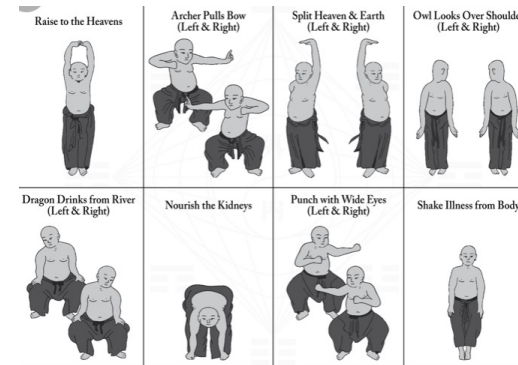


CARDIO



BURNS CALORIES

ANTI-AGING : Exercise



QiGong – Baduanjin

(TCM Twelve Meridian Pathways)

Qigong exercise improves the sleep quality of the patients with chronic fatigue syndrome: A waitlist randomized controlled trial

Monday, November 4, 2013 : 3:10 PM - 3:30 PM

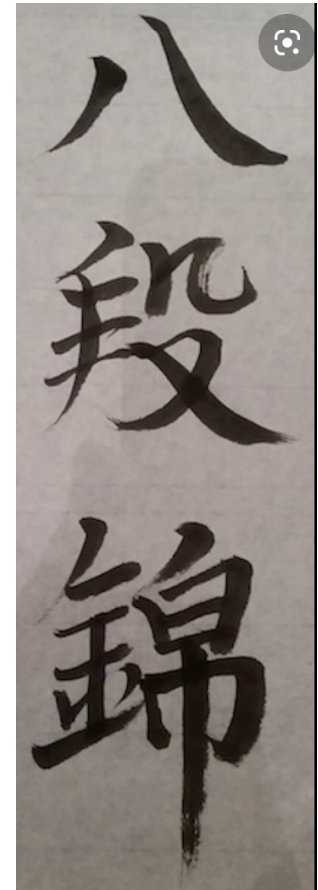
Jessie SM Chan, MPH, PhD candidate, Centre on Behavioral Health and The Department of Social Work and Social Administration, The University of Hong Kong, Hong Kong, China
Rainbow Ho, PhD, Centre on Behavioral Health and The Department of Social Work and Social Administration, The University of Hong Kong, Hong Kong, China
SM Ng, PhD, The Department of Social Work and Social Administration, The University of Hong Kong, Hong Kong, China
Eric TC Ziea, Chinese Medicine Department, Hospital Authority, Hong Kong, China
Bacon FL Ng, Chinese Medicine Department, Hospital Authority, Hong Kong, China
Cecilia LW Chan, PhD, Centre on Behavioral Health and The Department of Social Work and Social Administration, The University of Hong Kong, Hong Kong, China

Background: Our previous studies showed Qigong exercise may reduce fatigue level of patients with chronic fatigue syndrome (CFS). Sleep disturbance is a common complaint in CFS. However, few studies investigated it. Objectives: Effects of Qigong exercise on sleep quality and fatigue were assessed. The correlations between changes of sleep quality and fatigue were assessed as well as dosage of Qigong practice.

Methods: A RCT was conducted with Qigong (n = 75) and control (n = 75) groups. **16 sessions (twice a week for 8 weeks) of Baduanjin Qigong of 1.5 hours each was delivered.** Fatigue was measured by Chalder's fatigue and sleep quality was measured by Pittsburgh sleep quality index (PSQI) at baseline (T0), post-intervention (T1) and 3-month post-intervention (T2). The interaction effect of group and time in sleep quality and fatigue between two groups were compared by ANOVA. The correlations between changes of outcomes (T1 – T0) with dosage of Qigong were assessed. Results: PSQI were 10.0 (3.7) at T0, 8.2 (3.4) at T1 and 8.3 (3.4) at T2 for intervention group, and 10.2 (3.8), 9.5 (3.7) and 9.3 (3.5) for control group respectively. F-values for effect of group x time were 3.006 (p=0.048) for PSQI and 10.376 (p<0.001) for fatigue. Change of PSQI had significantly positive association (R=0.569, p< 0.001) with that of fatigue, and significantly negative with attendance rate of Qigong class (R=-0.288, p=0.013).

Conclusion: It suggested Qigong exercise can improve sleep quality of CFS and dosage of Qigong practice had a close relationship with improvement of sleep quality.

Acknowledgement: Hong Kong hospital Authority research fund



ANTI-AGING : Exercise

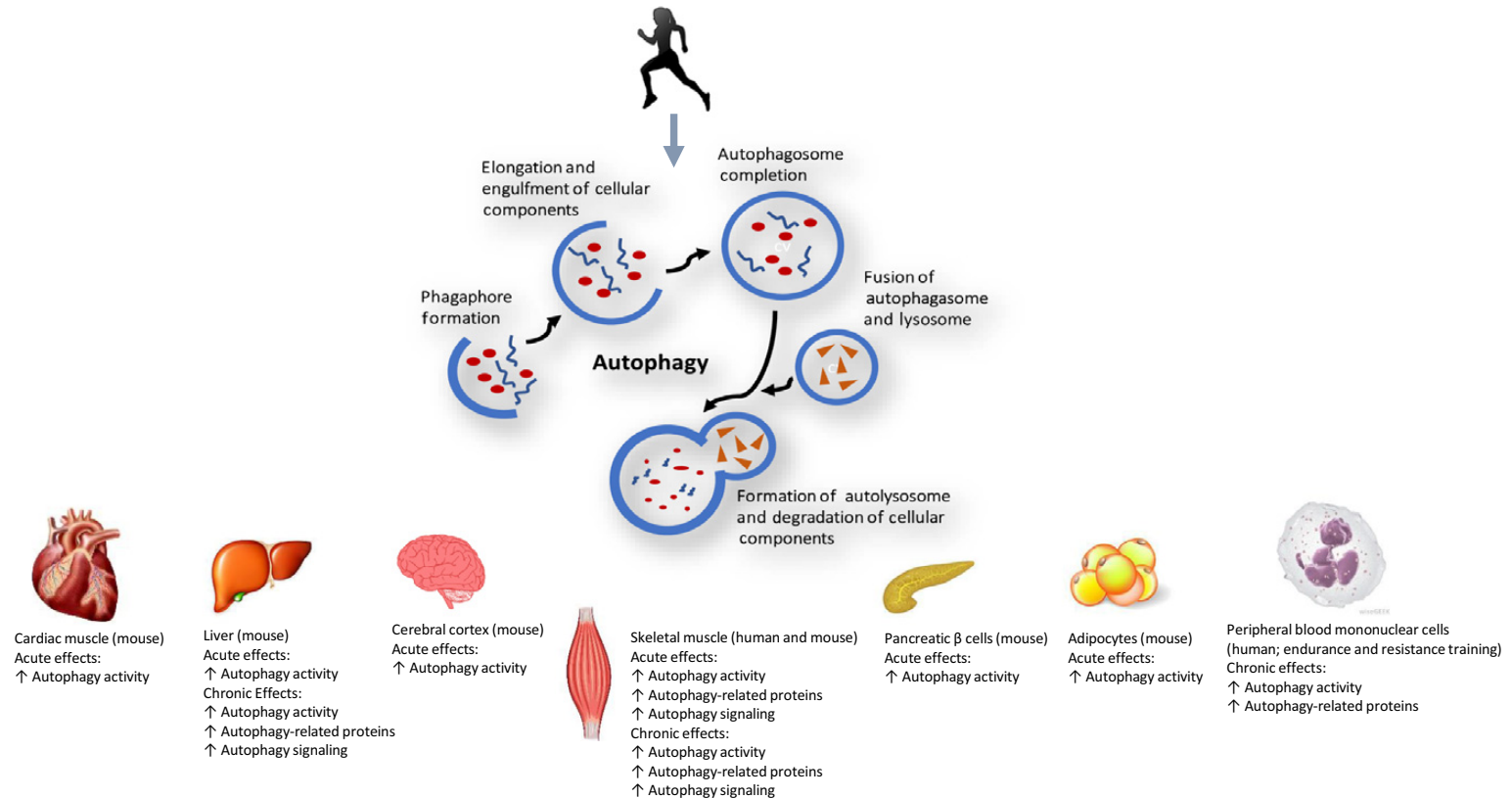
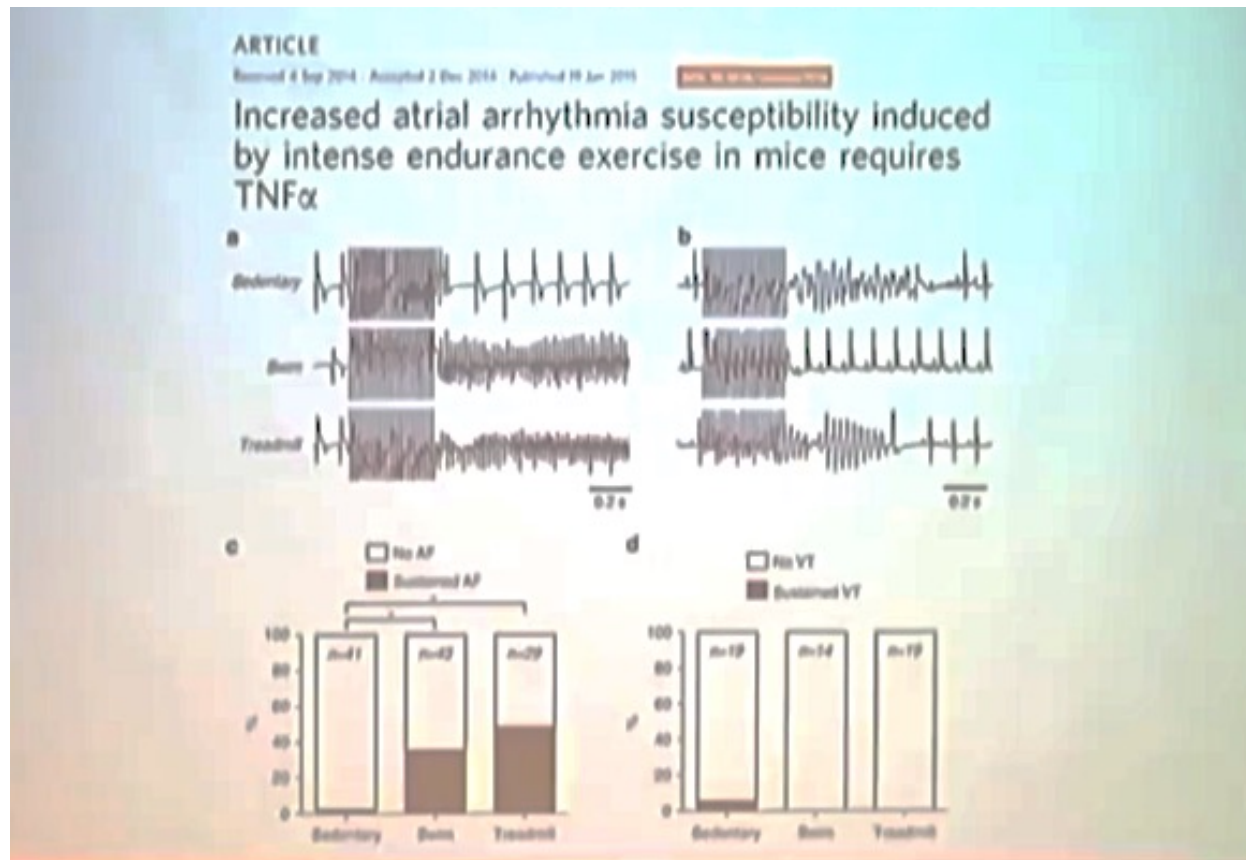


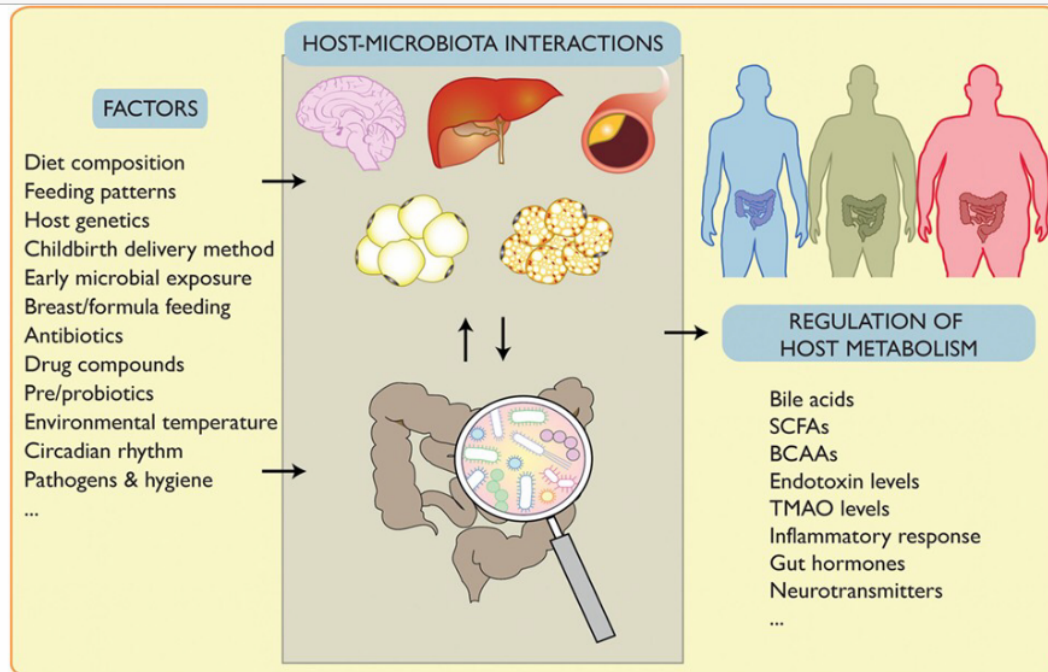
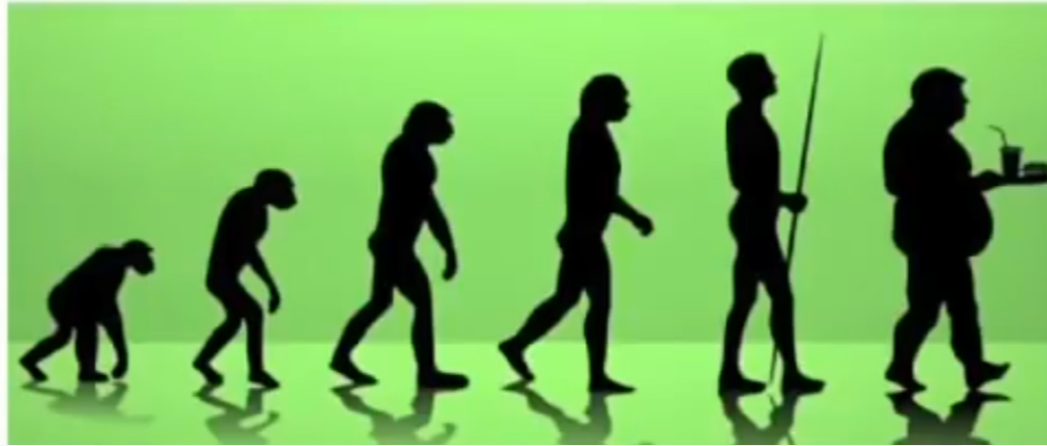
FIGURE 2 Effects of acute and chronic exercise on autophagy in multiple tissues

ANTI-AGING : Exercise

Excessive exercise can cause atrial fibrillation, irregular and often rapid heart rate that can increase risk of stroke, heart failure etc.



ANTI-AGING : Eating

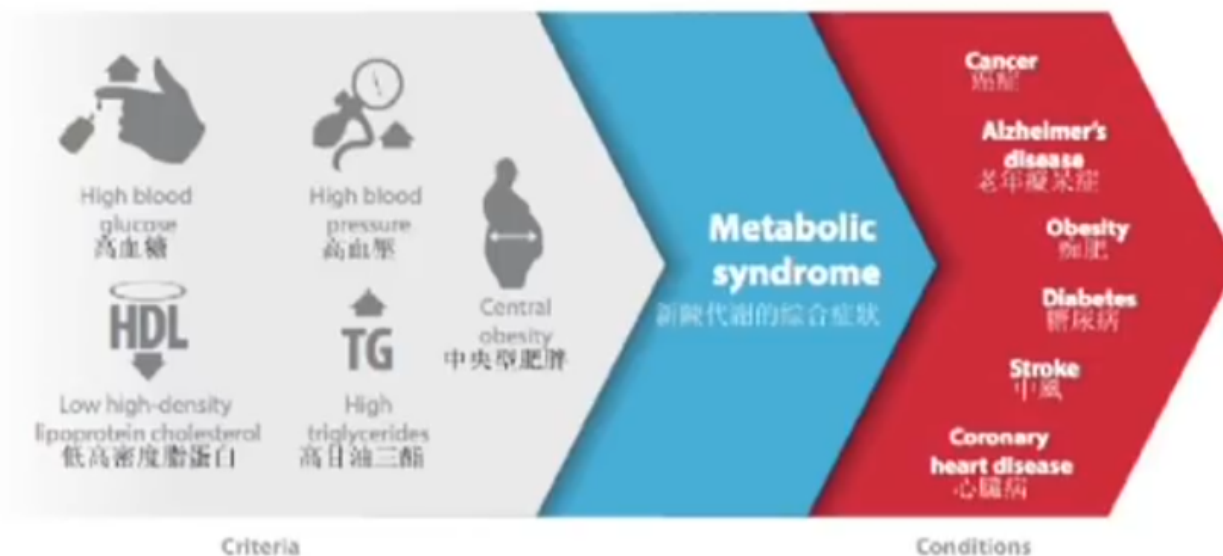


ANTI-AGING : Eating

Metabolic syndrome is the cause of most chronic diseases

Five criteria indicate metabolic dysfunction

Metabolic syndrome is defined as having any three at the same time



Source: Hotamisligil GS. Inflammation and metabolic disorders. *Nature*, 2006.



ANTI-AGING : Eating

Governments all recommend that people eat less fat and eat more cereals



美國農業部



香港食物環境衛生署

ANTI-AGING : Eating



[主頁](#) > [健康資訊](#) >
[非傳染病及健康生活](#) >
[健康飲食金字塔 均衡營養好體格](#)

健康飲食金字塔 均衡營養好體格

健康飲食金字塔

均衡飲食是維持健康的要素，我們應依照「健康飲食金字塔」的原則飲食，以穀物類為主，並多吃蔬菜及水果，進食適量的肉、魚、蛋和奶類及其代替品，減少鹽、油、糖分；並以去肥剩瘦，多採用低油量的烹調方法如蒸、燉、炆、焗、白灼等或用易潔鑊煮食，及減少煎炸，以求達致飲食均衡、促進健康。



ANTI-AGING : Eating

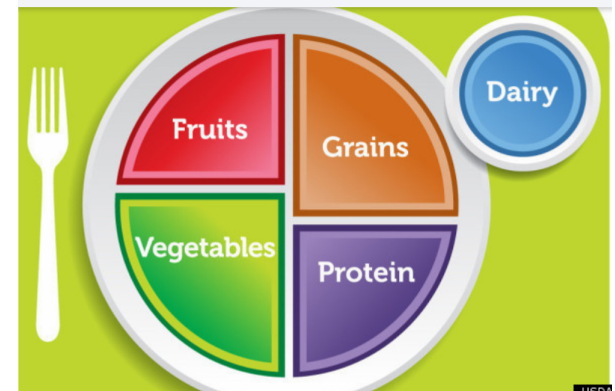
The USDA ditches the Food Pyramid for a Plate



1990s



2005



2012

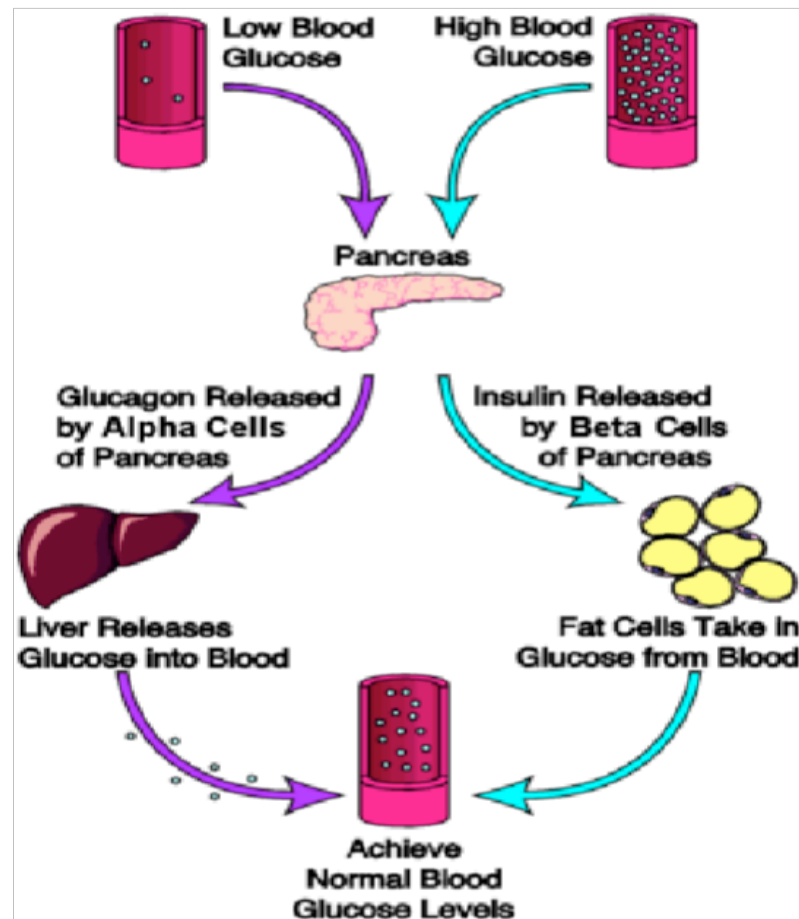
ANTI-AGING : Eating

Table of effects of food on Insulin and Glucagon

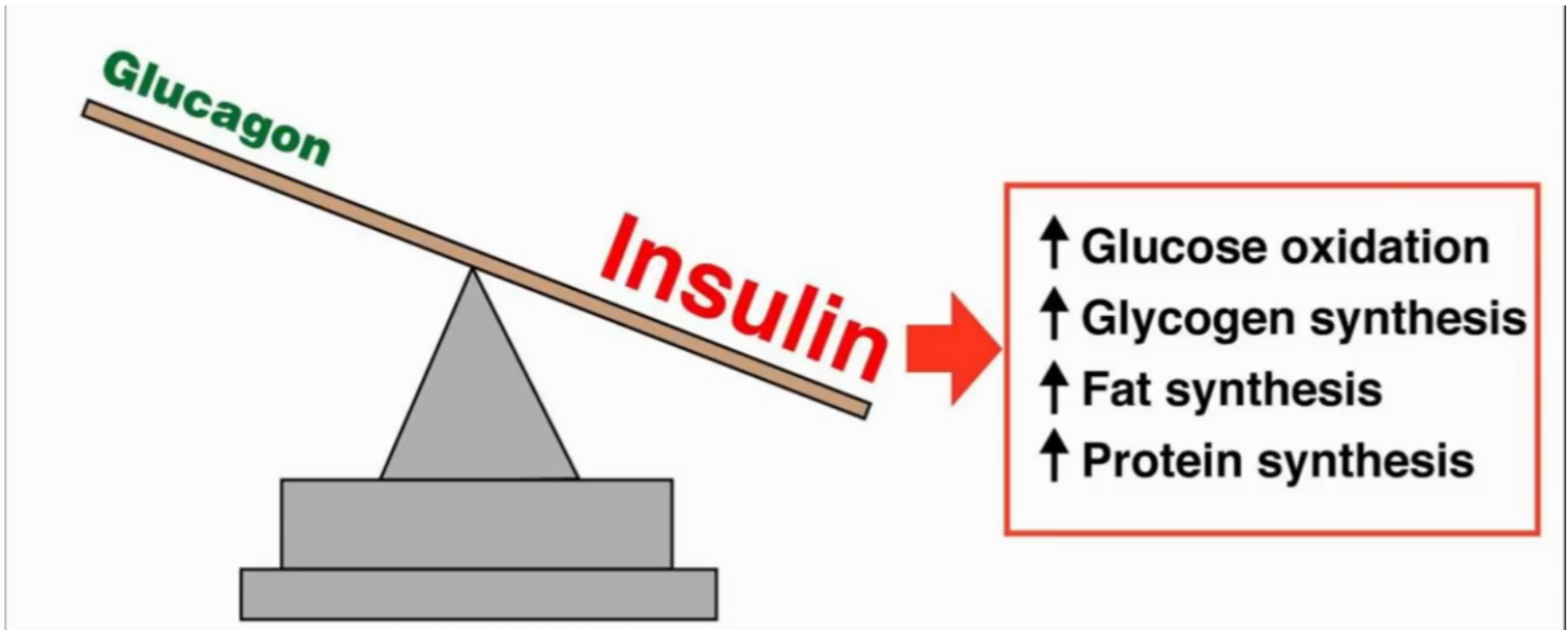
FOOD TYPE	INSULIN	GLUCAGON
Carbohydrate	^^^^	no change
Protein	^^	^^
Fat	no change	no change
Carbohydrate and Fat	^^^^	no change
Protein and Fat	^^	^^
High Protein and Low Carbohydrate	^^	^
High Carbohydrate and Low Protein	^^^^^^^^	^

ANTI-AGING : Eating

Insulin vs. Glucagon



ANTI-AGING : Eating



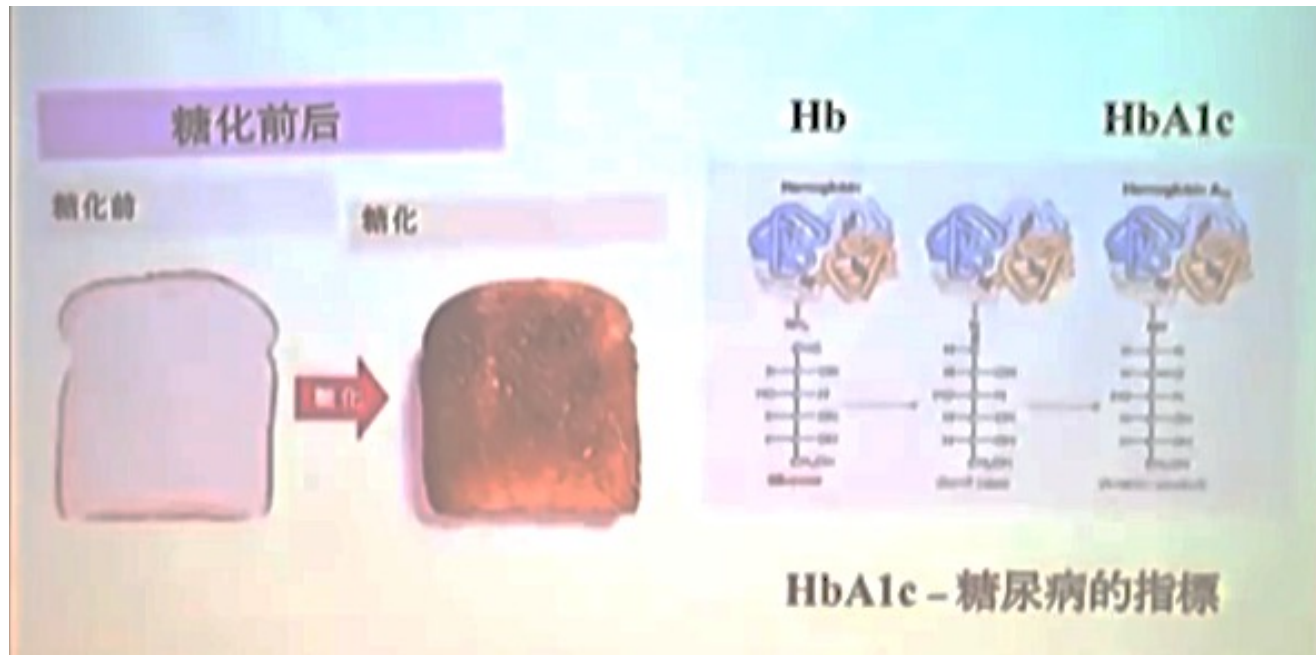
ANTI-AGING : Eating

The Function of Insulin and Glucagon

INSULIN	GLUCAGON
Lower blood sugar levels when blood sugar is high	Increase blood sugar levels when blood sugar is low
Turn body's metabolism into storage mode	Turn body's metabolism into burning mode
Convert glucose and protein to fat	Convert protein and fat to glucose
Store dietary fat	Convert dietary fat into ketone bodies and send them to various tissues of the body as energy
Transporting fat from the blood into the fat cells	Releases fat from fat cells into the blood for the body's tissues to use as energy
Increase cholesterol produced by the body	Reduce cholesterol produced by the body
Causing the kidneys to keep excess fluids	Causing the kidneys to release excess fluids
Stimulate the growth of smooth muscle cells	Stimulate the recovery of smooth muscle cells
Causing the body to use glucose as energy source	Causing the body to use fat as energy source

ANTI-AGING : Eating

- Senescence : **glycation of proteins**
- High blood glucose will accelerate aging



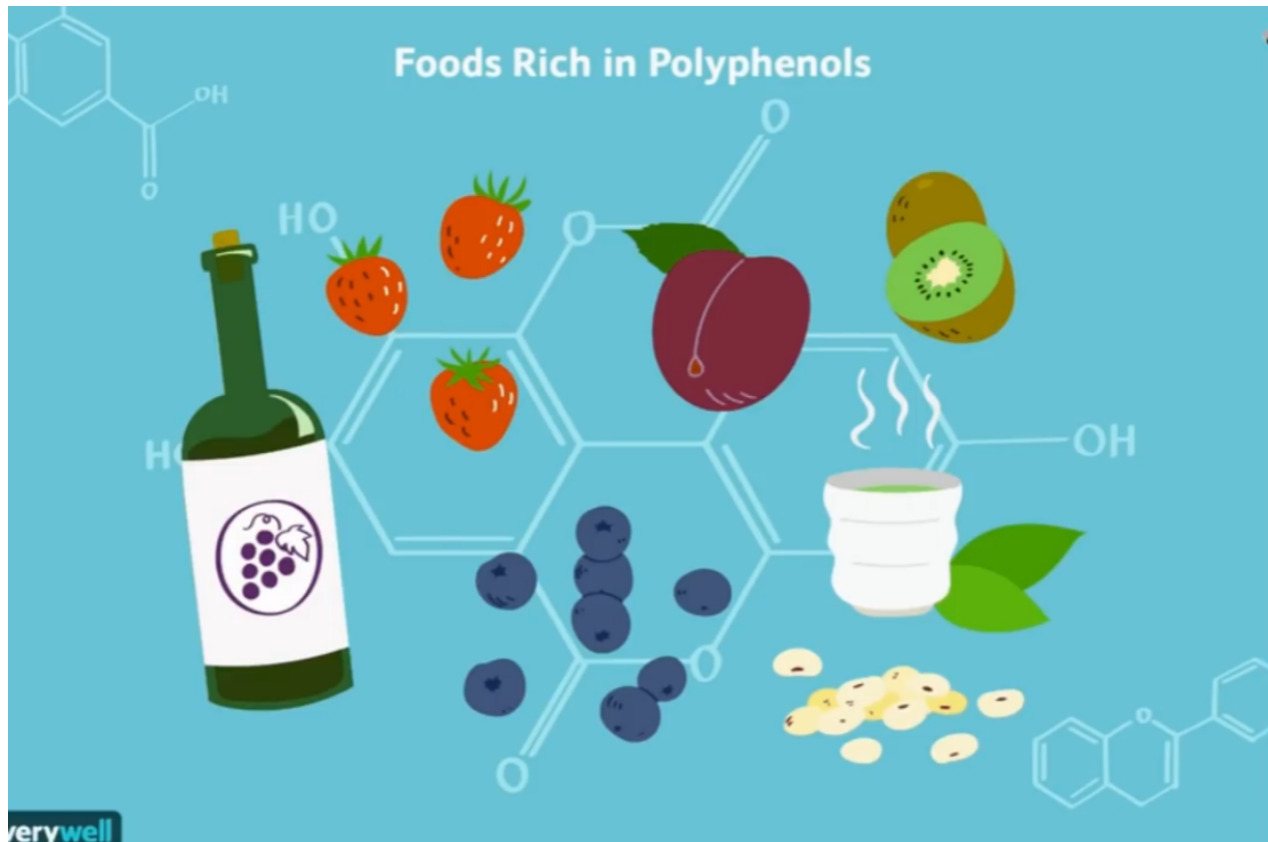
ANTI-AGING : Eating

HEALTHY EATING

- Eggs and saturated fat are healthy
- Use less or do not use seed oil, use butter, coconut oil
- Reduce the consumption of carbohydrates (sugar, starch)
- Eat lots of vegetables, melons
- Eat the right amount of fruit, do not drink/eat high fructose syrup drink/food
- Whole grain is not necessarily healthy

ANTI-AGING : Eating

Polyphenols are micronutrients that we get through certain plant-based foods. They are packed with antioxidants and potential health benefits. It's thought that polyphenols can improve or help treat digestion issues, weight management difficulties, diabetes, neurodegenerative disease, and cardiovascular diseases.



ANTI-AGING : Eating

- The biggest intervention for making more mitochondria are caloric restriction and exercise from time to time, and in combination with compounds like **epicatechins**, **resveratrol**, **vanilla**, **compounds in the tea**, can turn and increase energy indirectly by making more mitochondria.
- So, we want metabolism, we want healthy mitochondria, and we want to turn those over as well, and repair and remodel those.
- Epicatechins can be found in **dark chocolate**, resveratrol in **red wine**, antioxidants in **tea**, they can turn and increase energy indirectly by making more mitochondria, PGC-1alpha.

ANTI-AGING : Fasting

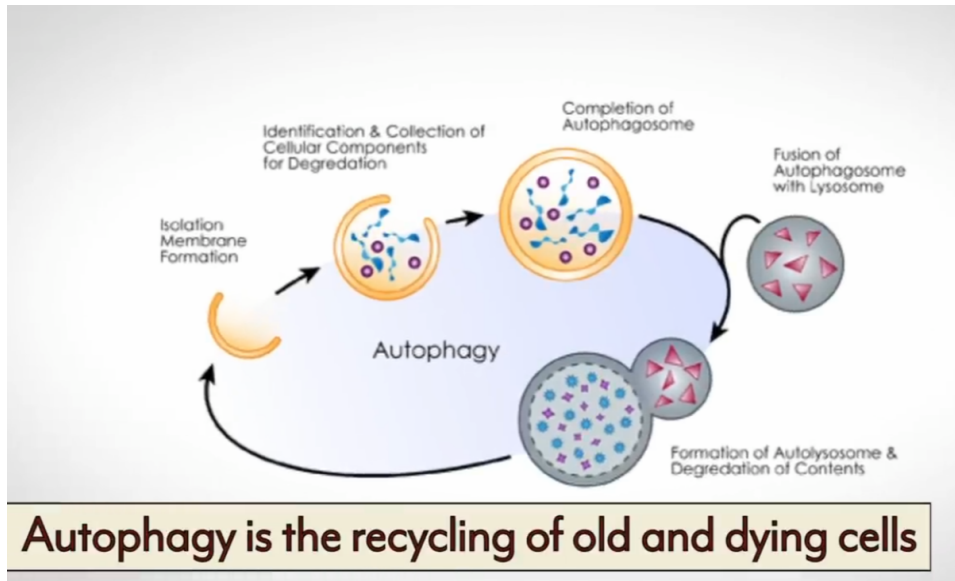


DISCUSSIONS ON FASTING

- ❖ Fasting Benefits
- ❖ How To Start Intermittent Fasting
- ❖ Fasting Biometrics
- ❖ Bioeffects of Fasting
- ❖ Medical Research
 - ✧ Fasting against Diabetes
 - ✧ Fasting against Cancer
- ❖ Food For Thought

FASTING BENEFITS

- Fasting reduce fat accumulation and prevent fatty liver
- Fasting can increase insulin sensitivity
- Fasting can improve metabolic syndrome
- Fasting can increase the number of stem-cells
- Fasting can turn on the autophagy process

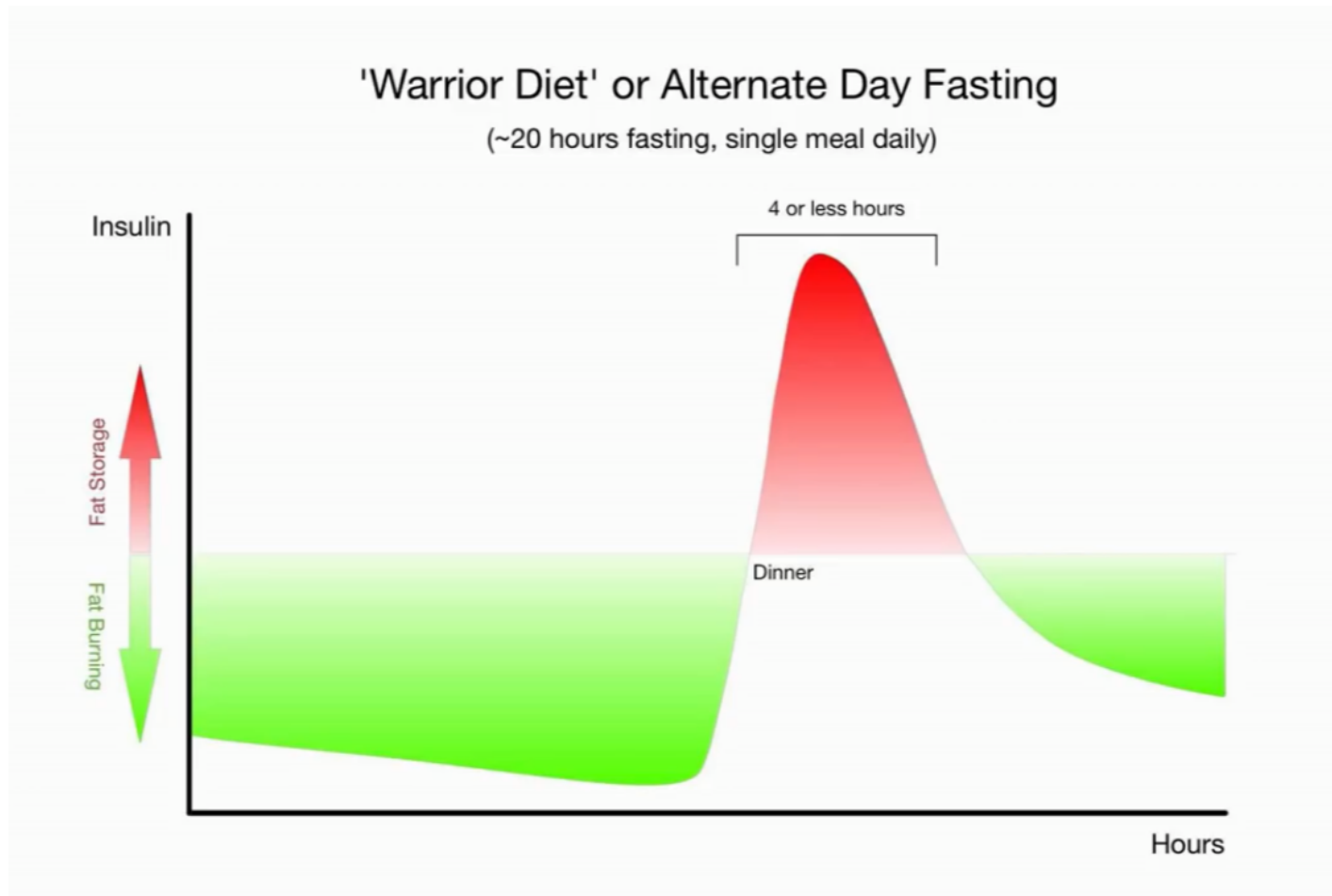


HOW TO START INTERMITTENT FASTING



1. Normal three meals, eat dinner early, don't eat snacks when staying up late
2. Two meals a day, no breakfast or lunch, early dinner (Breakfast at 0700 and lunch finish at 1300, or lunch at 1200 and dinner finish at 2000)
3. Eat food only 4-5 hours a day

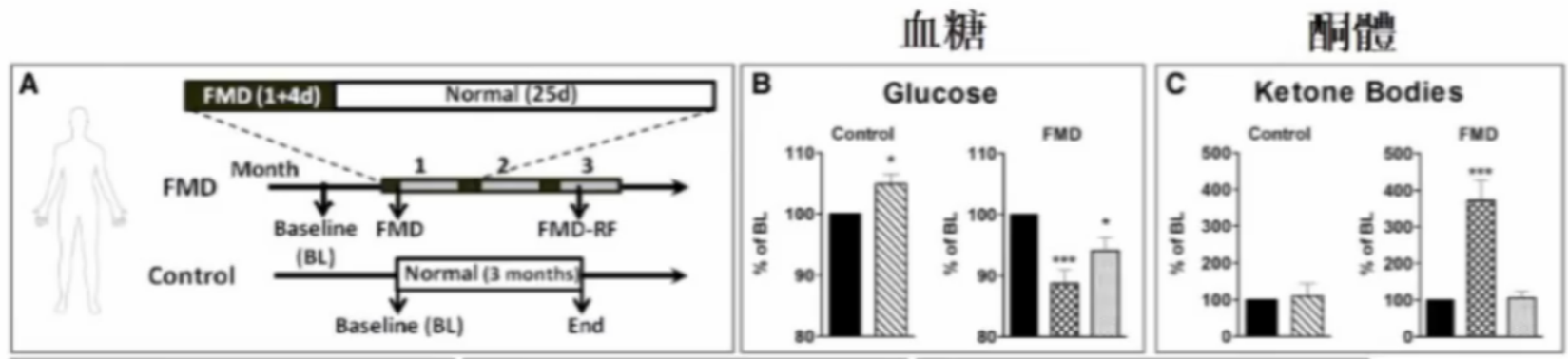
HOW TO START INTERMITTENT FASTING



A very low caloric intake in 16 plus hours a day

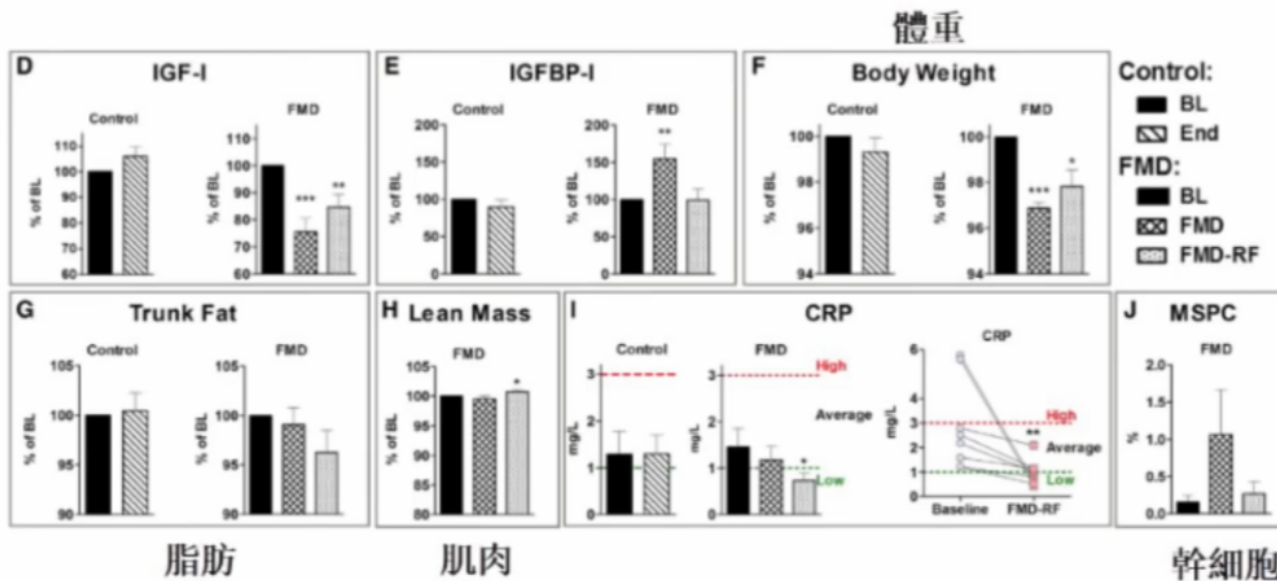
FASTING BIOMETRICS

Within three months, a five-day fasting meal once a month



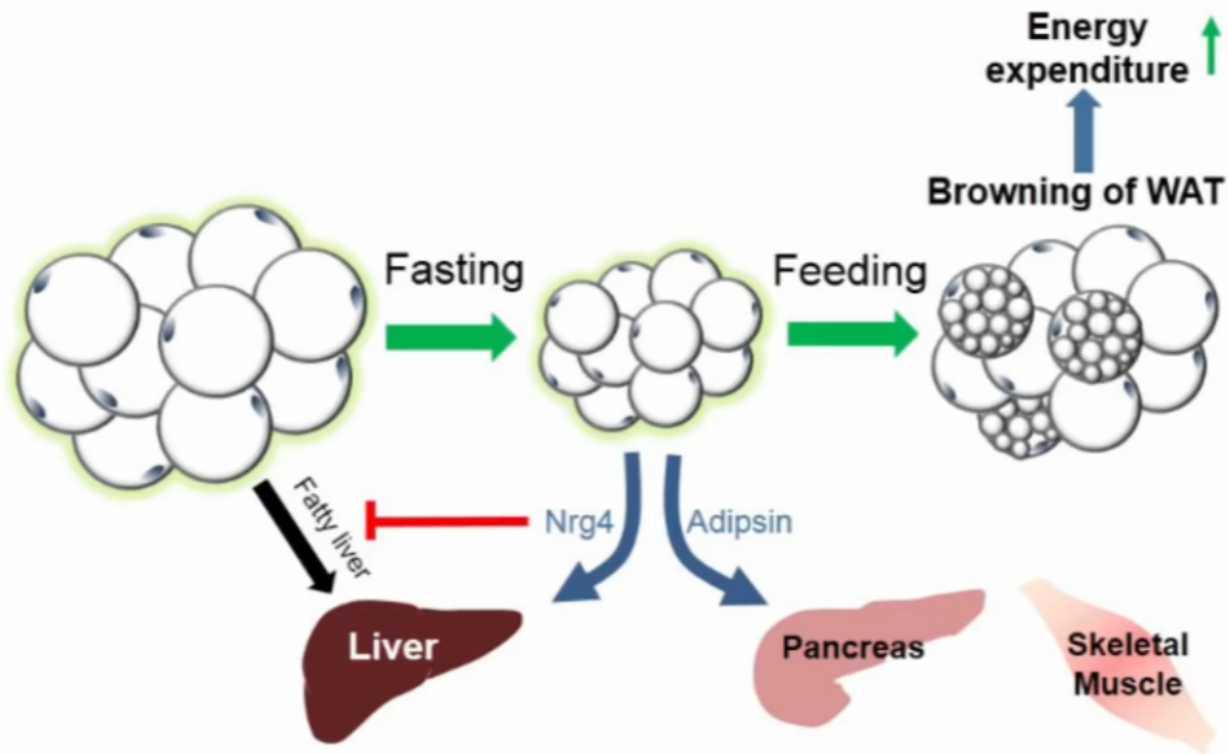
FASTING BIOMETRICS

Within three months, a five-day fasting meal once a month can reduce the indicators of various chronic diseases and improve metabolism



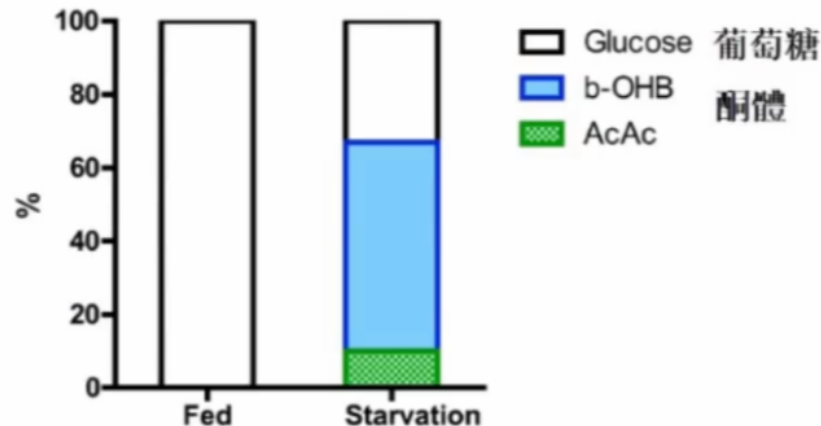
BIOEFFECTS OF FASTING

Fasting to exercise our fat



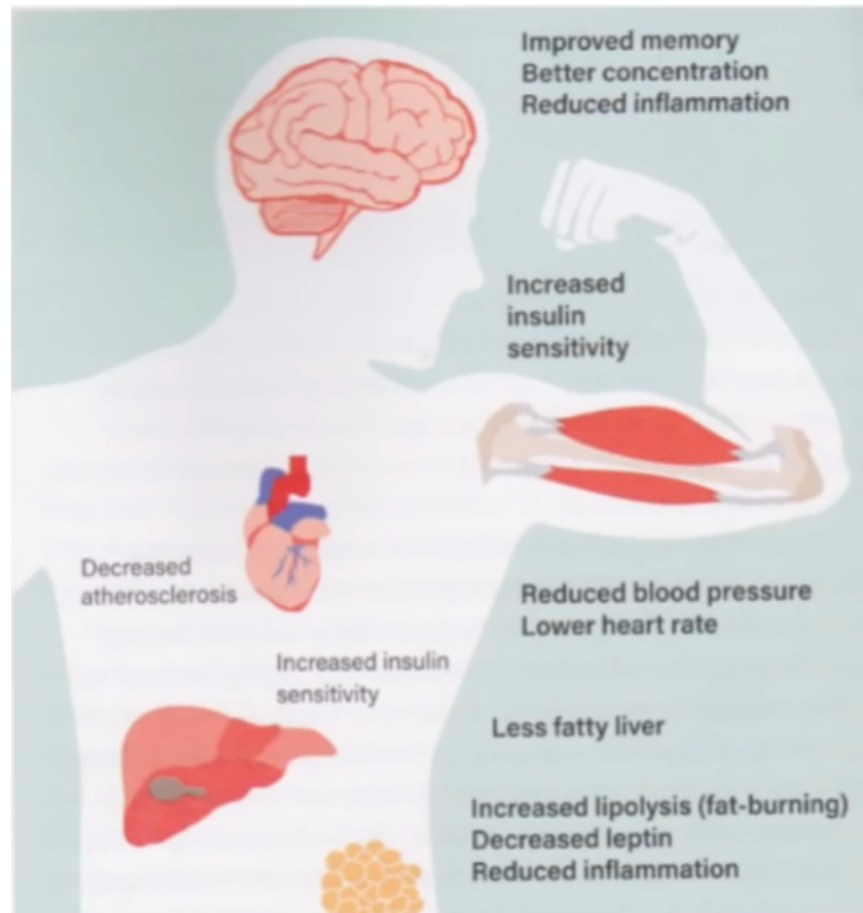
BIOEFFECTS OF FASTING

During fasting, brain cells will switch from using glucose to ketone bodies to produce cellular energy. Ketone bodies is the byproduct of the body breaking down fat for energy that occurs when carbohydrates intake is low



Longo & Mattson, Cell Metabolism (2014)

BIOEFFECTS OF FASTING



“The Complete Guide to Fasting” by Jason Fung and Jimmy Moore (2016)

MEDICAL RESEARCH

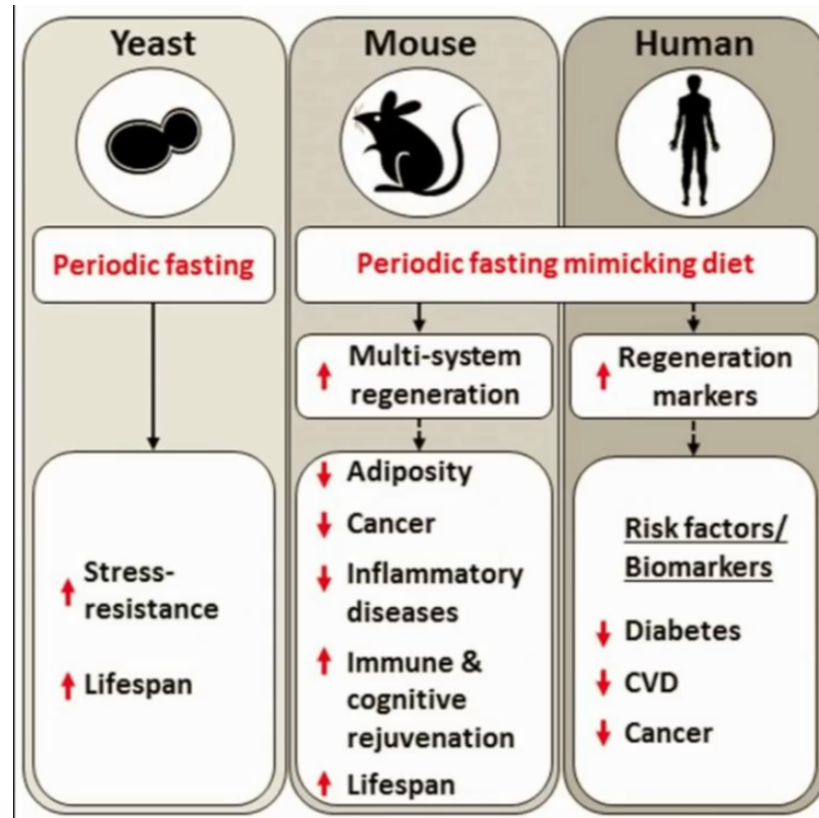
Every one has a doctor in him; we just have to help him in his work.
The natural healing force within each one of us is the greatest force
in getting well. To eat when you are sick, is to feed your sickness.

~Hippocrates

Medical beneficial effects against...

- Aging (老化)
- Cancer (癌症)
- Cardiovascular diseases/CVD (心血管疾病)
- Neurodegenerative diseases (腦退化)
- Metabolic diseases (代謝疾病)

MEDICAL RESEARCH

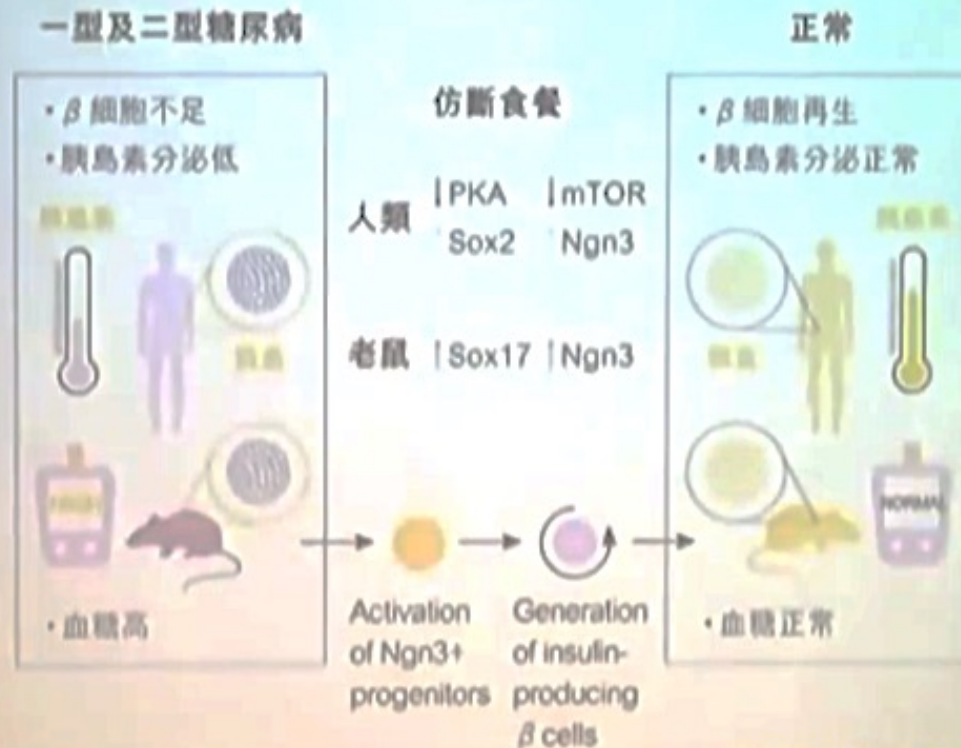


A Periodic Diet that Mimics Fasting Promotes Multi-System Regeneration, Enhanced Cognitive Performance, and Healthspan

Sebastian Brandhorst,^{1,15} In Young Choi,^{1,15} Min Wei,¹ Chia Wei Cheng,¹ Sargis Sedrakyan,² Gerardo Navarrete,¹ Louis Dubeau,³ Li Peng Yap,⁴ Ryan Park,⁴ Manlio Vinciguerra,⁵ Stefano Di Biase,¹ Hamed Mirzaei,¹ Mario G. Mirisola,⁶ Patra Childress,⁷ Lingyun Ji,⁸ Susan Groshen,⁸ Fabio Penna,⁹ Patrizio Odetti,¹⁰ Laura Perin,² Peter S. Conti,⁴ Yuji Ikeno,¹¹ Brian K. Kennedy,¹² Pinchas Cohen,¹ Todd E. Morgan,¹ Tanya B. Dorff,¹³ and Valter D. Longo^{1,14,*}

MEDICAL RESEARCH : Fasting against Diabetes

Schematic diagram of fasting reversal of type 1 and type 2 diabetes



Cheng CW et al. Cell (2017)

MEDICAL RESEARCH : Fasting against Cancer

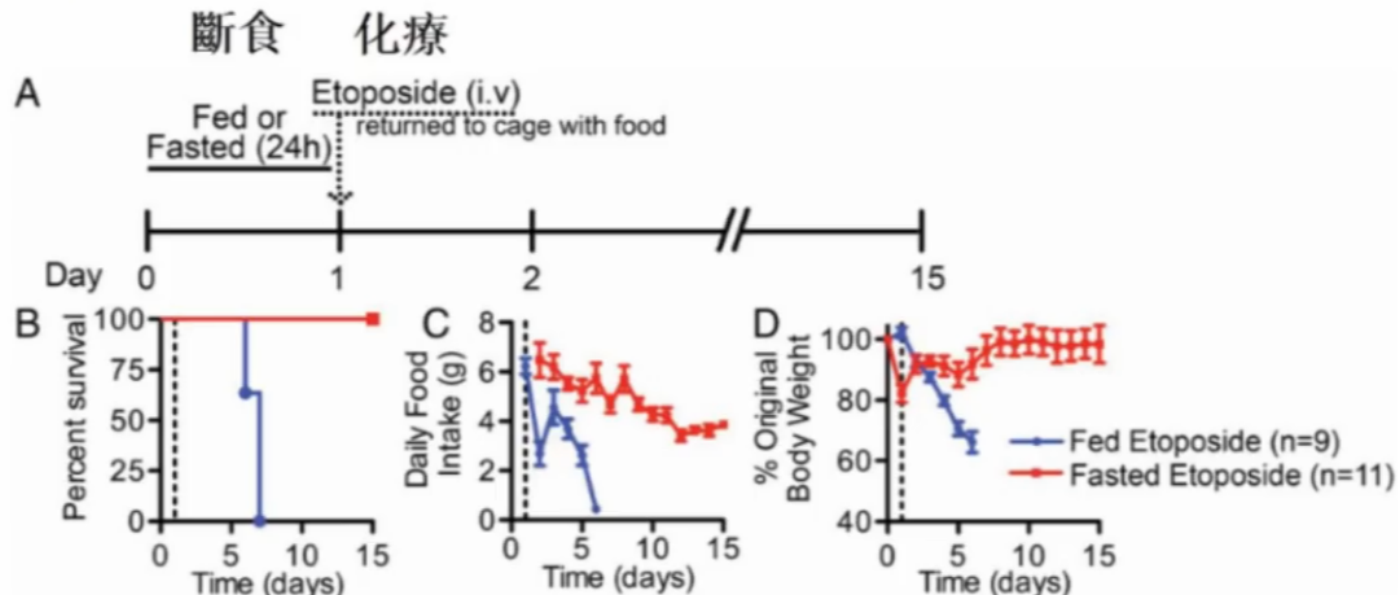


Fasting protects mice from lethal DNA damage by promoting small intestinal epithelial stem cell survival

Kelsey L. Tinkum^{a,b,1}, Kristina M. Stemler^{c,1}, Lynn S. White^{a,b}, Andrew J. Loza^d, Sabrina Jeter-Jones^c, Basia M. Michalski^a, Catherine Kuzmicki^a, Robert Pless^e, Thaddeus S. Stappenbeck^f, David Piwnica-Worms^{a,b,c,g,2}, and Helen Piwnica-Worms^{a,c,d,2}

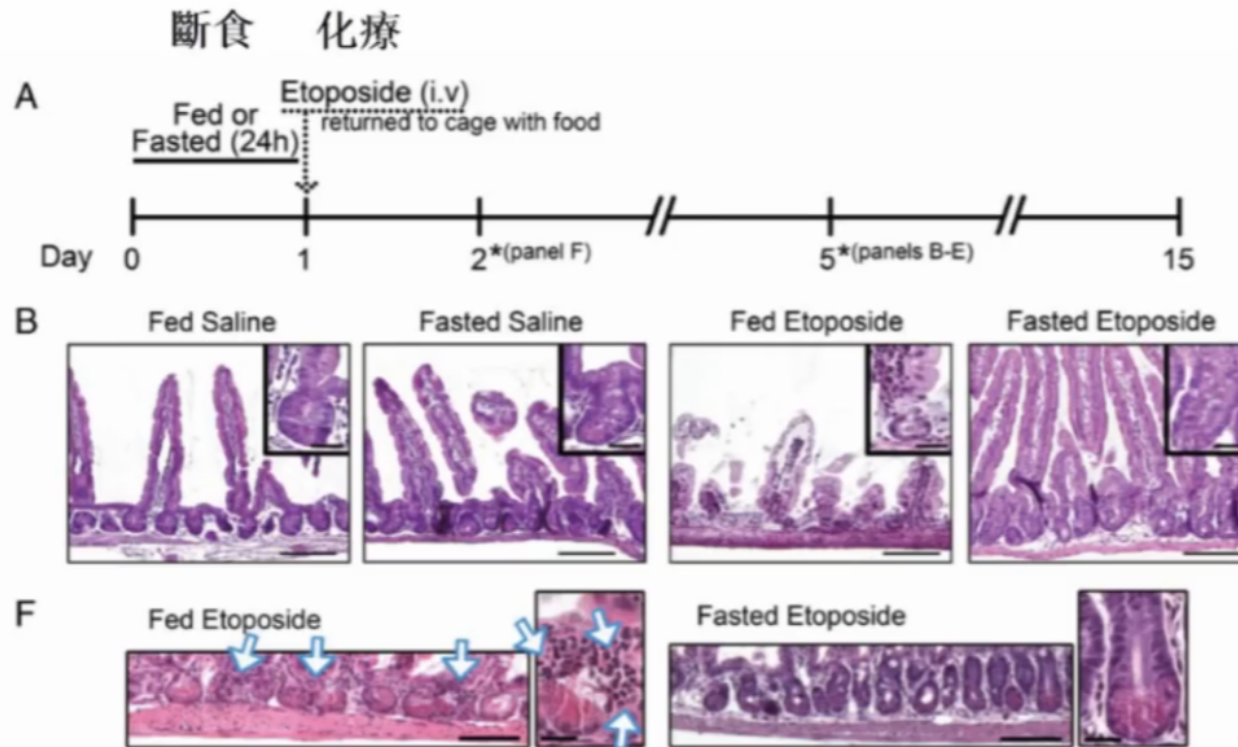
E7148–E7154 | PNAS | Published online December 7, 2015

www.pnas.org/cgi/doi/10.1073/pnas.1509249112



MEDICAL RESEARCH : Fasting against Cancer

Fasting can protect intestinal cells from anti-cancer drugs



MEDICAL RESEARCH : Fasting against Cancer

Fasting can help the immune system fight cancer

Fasting-Mimicking Diet Reduces HO-1 to Promote T Cell-Mediated Tumor Cytotoxicity

Stefano Di Biase,^{1,4} Changhan Lee,^{1,4} Sebastian Brandhorst,¹ Brianna Manes,¹ Roberta Buono,¹ Chia-Wei Cheng,¹ Mafalda Cacciottolo,¹ Alejandro Martin-Montalvo,² Rafael de Cabo,² Min Wei,¹ Todd E. Morgan,¹ and Valter D. Longo^{1,3,*}

Cancer Cell 30, 136–146, July 11, 2016 © 2016 Elsevier Inc.

Caloric Restriction Mimetics Enhance Anticancer Immunosurveillance

Federico Pietrocola,^{1,2,3,23} Jonathan Pol,^{1,2,3,5,23} Erika Vacchelli,^{1,2,3} Shuan Rao,⁶ David P. Enot,^{1,7} Elisa E. Baracco,^{1,2,3,4} Sarah Levesque,^{1,2,3,4} Francesca Castoldi,^{1,2,3,4,8} Nicolas Jacquilot,^{1,4,9,10} Takahiro Yamazaki,^{1,4,9,10} Laura Senovilla,^{1,2,3,5} Guillermo Marino,^{1,2,3} Fernando Aranda,^{1,2,3} Sylvère Durand,^{1,7} Valentina Sica,^{1,2,3,4} Alexis Chery,^{1,7} Sylvie Lachkar,^{1,2,3,4} Verena Sigl,⁶ Norma Bloy,^{1,2,3,4} Aitziber Buque,^{1,2,3,4} Simonetta Falzoni,¹¹ Bernhard Ryffel,^{12,13} Lionel Apetoh,^{14,15,16} Francesco Di Virgilio,¹¹ Frank Madeo,^{17,18} Maria Chiara Maiuri,^{1,2,3,4} Laurence Zitvogel,^{1,4,9,10} Beth Levine,¹⁹ Josef M. Penninger,^{6,24} and Guido Kroemer^{1,2,3,5,7,20,21,22,24,*}

Cancer Cell 30, 147–160, July 11, 2016 © 2016 Elsevier Inc.

MEDICAL RESEARCH : Fasting against Cancer

Cell Cycle 9:22, 4474-4476; November 15, 2010; © 2010 Landes Bioscience

Fasting and differential chemotherapy protection in patients

Lizzia Raffaghello,^{2,3} Fernando Safdie,^{1,2} Giovanna Bianchi,² Tanya Dorff,⁵ Luigi Fontana^{3,4} and Valter D. Longo^{1,*}

¹Andrus Gerontology Center; Dept. of Biological Sciences; and ²Norris Cancer Center; University of Southern California; Los Angeles, CA USA;

³Laboratory of Oncology; Giannina Gaslini Institute; Genova, Italy; ⁴Division of Geriatrics and Nutritional Science; Washington University in St. Louis; St. Louis, MO USA; ⁵Division of Nutrition and Aging; Istituto Superiore di Sanità; Rome, Italy

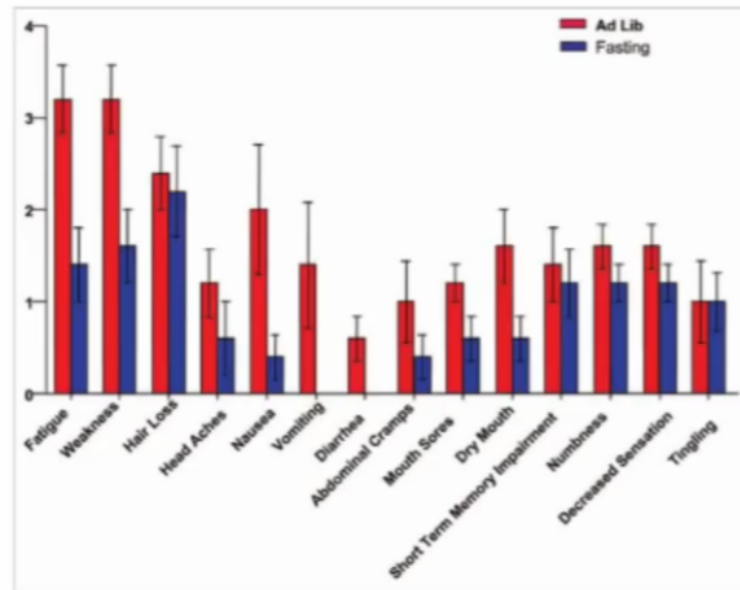


Figure 1. Average self-reported severity of symptoms in patients that have received chemotherapy with or without fasting.

FOOD FOR THOUGHT

“He that eats till he is sick must fast till he is well.”

T. Fuller

Gnomologia; Adagies and Proverbs, 1732.

FOOD FOR THOUGHT

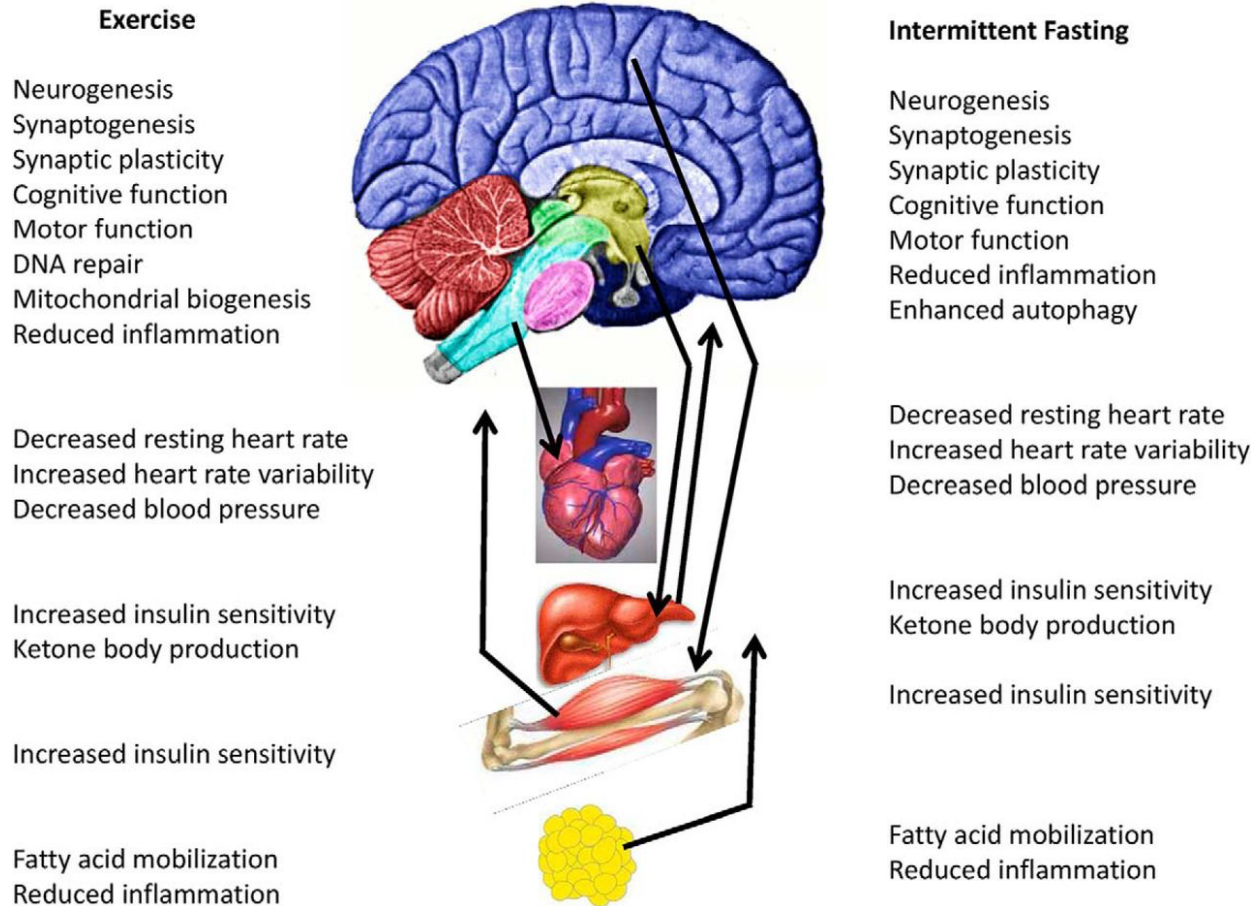
“If you want to ascend like the Prophet to the sky of immortality, know this very well: Fasting is your Arabian stallion.”

Rumi, translated by Nevit O. Ergin

ANTI-AGING LIFE STYLE



ANTI-AGING LIFE STYLE : Intermittent Fasting and Exercise



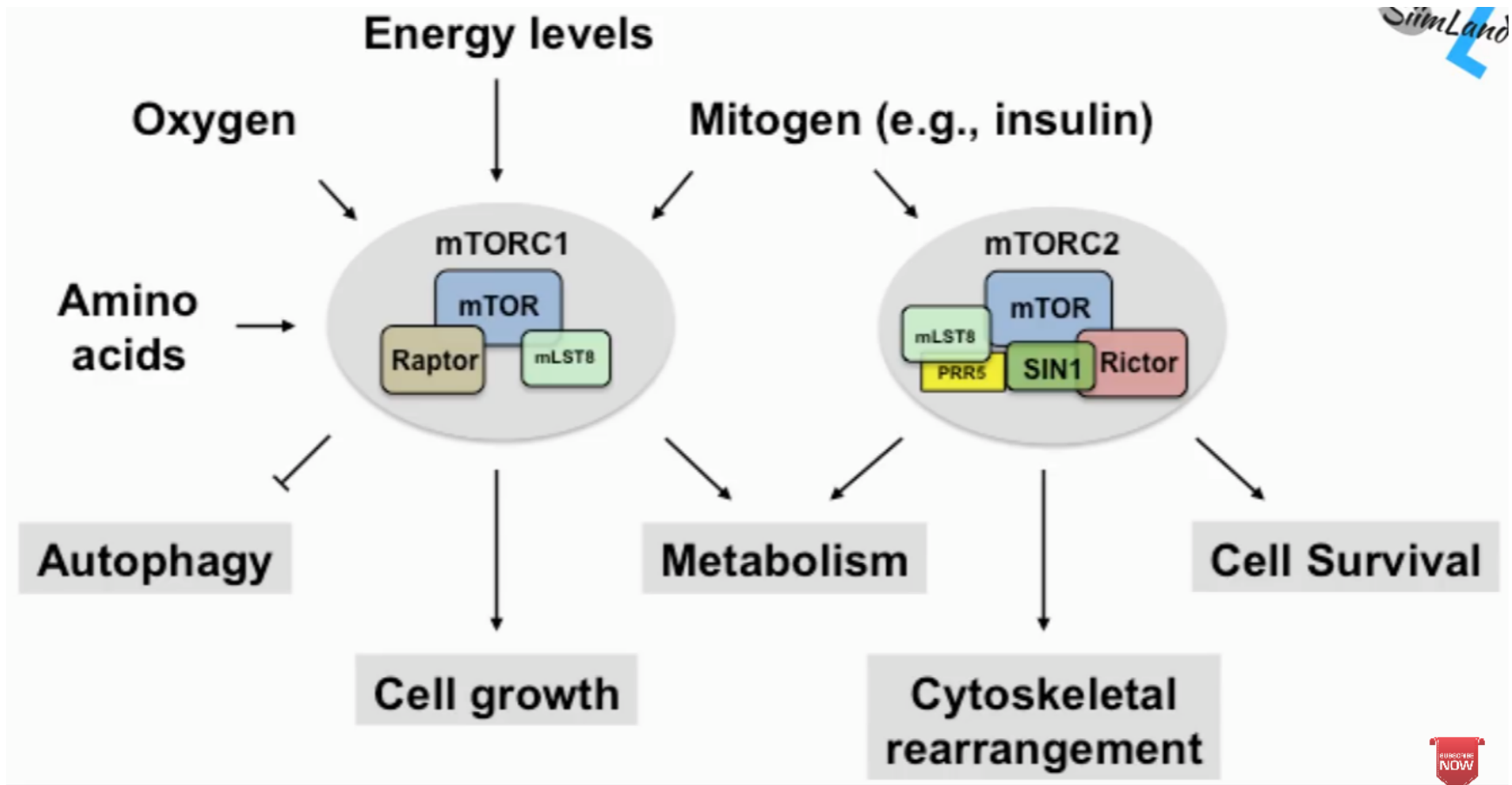
Exercise, Energy Intake, Glucose Homeostasis, and the Brain

Henriette van Praag, Monika Fleshner, Michael W. Schwartz and Mark P. Mattson

Journal of Neuroscience 12 November 2014, 34 (46) 15139-15149; DOI: <https://doi.org/10.1523/JNEUROSCI.2814-14.2014>

2814-14.2014

ANTI-AGING LIFE STYLE : Bioeffects



ANTI-AGING LIFE STYLE : Eating, Fasting and Exercise

- Some compounds like **epicatechins** and **flavanols** in dark chocolate, especially when the body has actually very little during the **fasting** periods, take some of those compounds will stimulate it even more.
- In one study in the heart, it was shown that **caloric restriction** plus **resveratrol** is having an effect. Where caloric restriction alone in the old hearts was not as effective. So as we get old, certain pathways to turn on autophagy biological pathways are not optimal, and we need a little help from time to time. So, combinational types of therapies and treatments are going to be the future.
- ***Both nutrition and life style changes are going to be critical to optimize our health span and performance, doesn't matter how old we are!***

ATTRIBUTION

許志忠教授

- 多倫多病童醫院發育及幹細胞生物學系主任
- 多倫多大學醫學院分子遺傳學教授
- 香港大學客座生物化學系教授
- 上海生物化學與細胞生物學研究所導師



•2000許教授獲得加拿大國安大略政府頒發的，年 Premier's Research Excellence Award 及加拿大國家癌症研究所頒發的Terry Fox Young Investigator Award。

•四肢和皮膚的胚胎發育，心臟，研究中樞神經系統，許教授的研究利用實驗小鼠為模型心臟疾病和代謝、癌症、研究先天性畸形綜合症，他的研究小組已經建立了許多小鼠模型。並發，他的研究小組最近發現了能量平衡的幾個關鍵調控基因，有關這次講座。謝性疾病。現這些基因的表達水平是影響人類肥胖的重要因素

•許博士發表了超過，迄今為止130他的工作被引用超過，同行評審的研究文章和評論13000。次

REFERENCE



REFERENCE



REFERENCE

