LONGEVITY CONCEPTS: EAST MEET WEST

แพทย์หญิง ปิยะนุช รักพาณิชย์
สถาบันหัวใจเพอร์เฟคฮาร์ท โรงพยาบาลปิยะเวท

Longevity

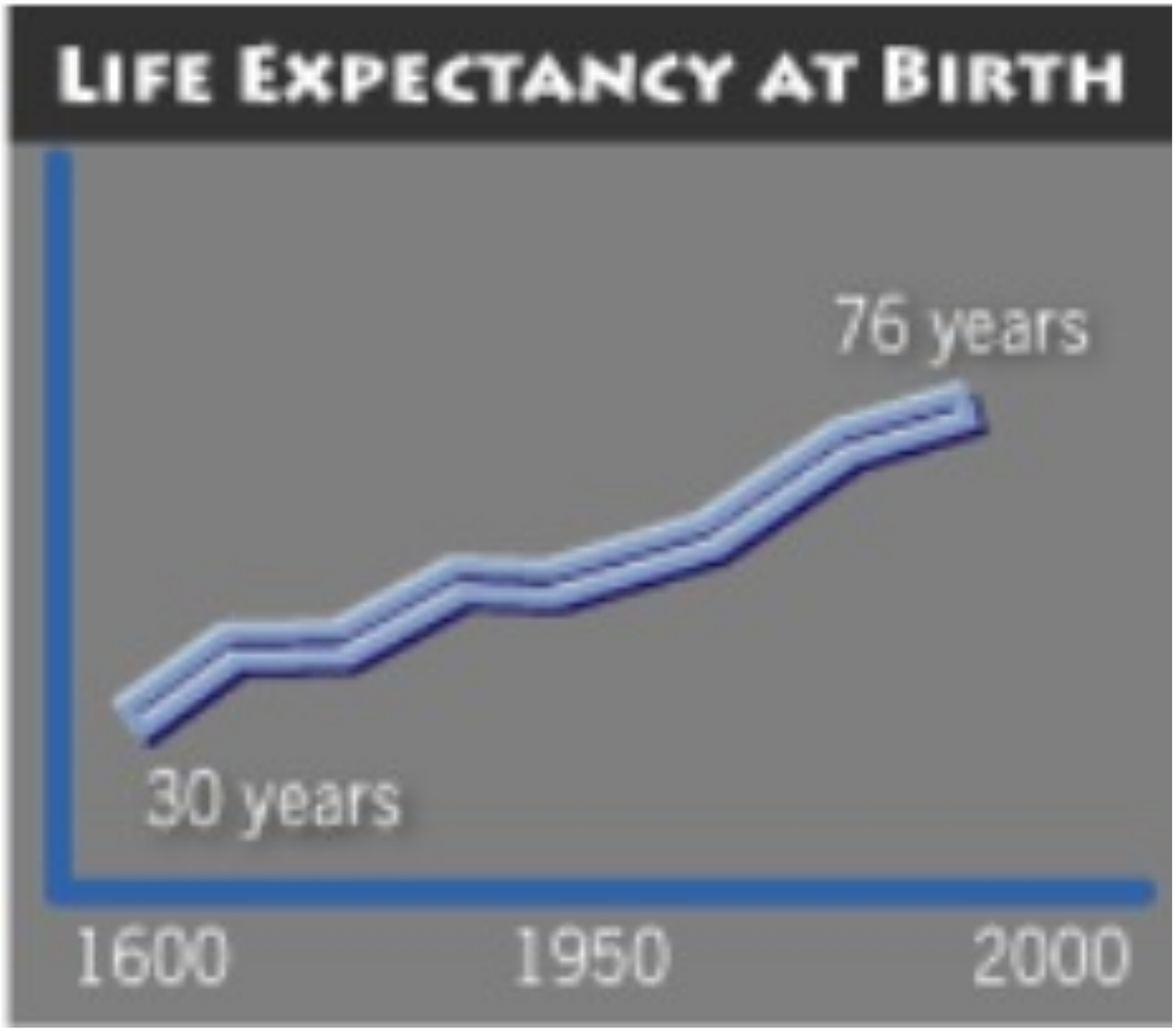
Long duration of individual life
Great Duration of Life

ชีวิตอันยืนยาว
อายุขัย

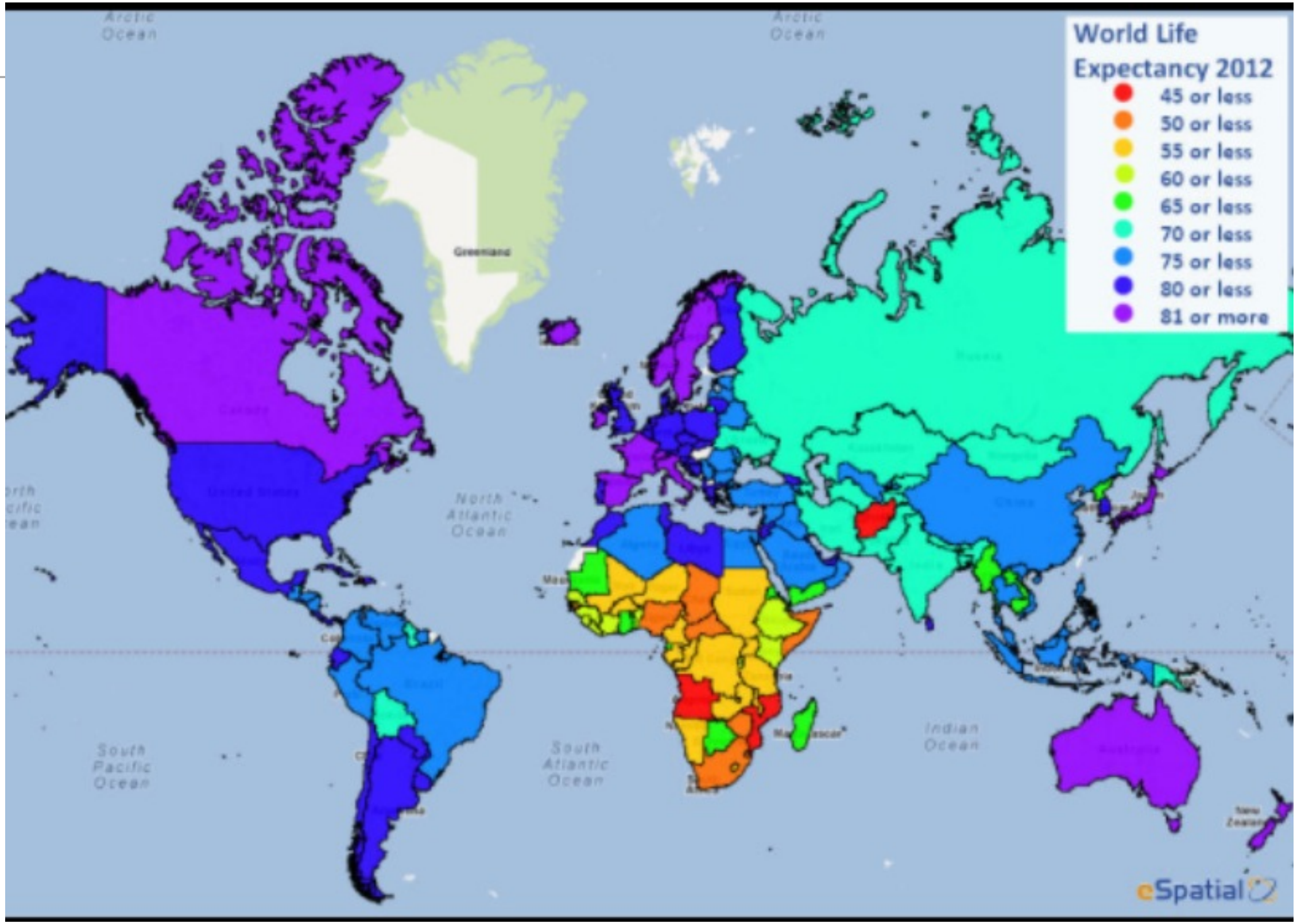
Longevity study: Calories Restriction

- 1930s : rat & mice with calories restricted diet had 40% live longer
- 2000s: monkey with calories restricted diet had less or delayed aged related diseases
- 2002: CALERIE study; improve blood test, better mitochondria function and reduce cell damage
- Mechanism: reduce oxidative stress, improve defense mechanism, effect of brain functions, hormone balance, gene, etc.
- Calories Restriction Mimic study: Reservatrol

Are we really live longer?



World Life Expectancy

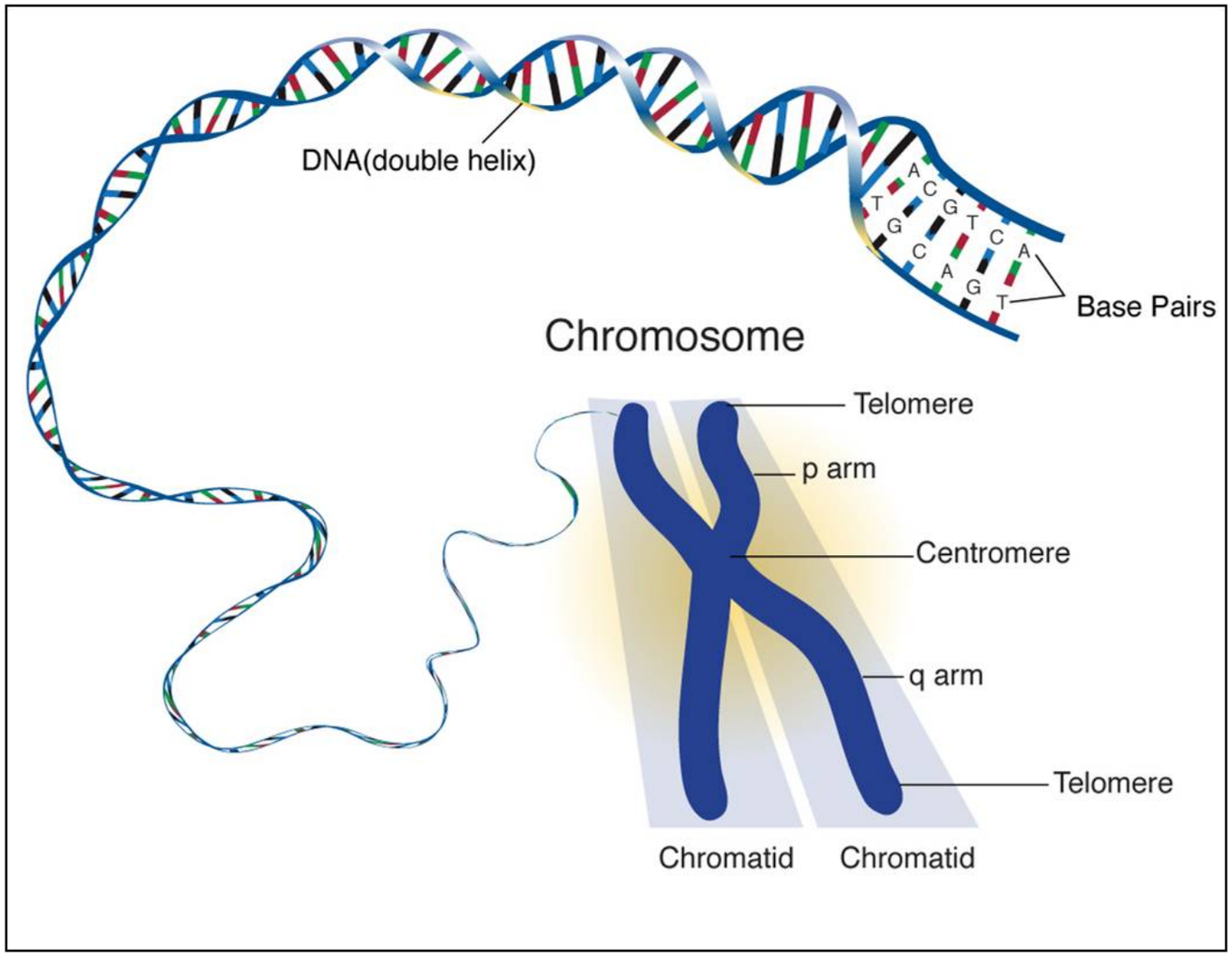


Why we aged?: West Side Story

- Genetic
- Telomere shortening
- Glycation
- Oxidative Stress
- Hormone Depletion

Genetic & Longevity

- Longevity Gene
- Epigenetics



Telomere

- Telomere เป็นองค์ประกอบส่วนปลายของโครโมโซม ทำหน้าที่เสมือนส่วนหุ้มปลายโครโมโซม คล้ายกับพลาสติกที่หุ้มปลายเชือกรองเท้า

- ขบวนการการแบ่งเซลล์ Telomere จะมีการหดสั้นลง จนถึงจุดหนึ่งเซลล์จะแบ่งตัวต่อไปไม่ได้และเสื่อมลงจนตายไปในที่สุด

- สามารถวิเคราะห์การเสื่อมของ เซลล์หรืออายุขัยได้จากขนาดของ Telomere ที่หดสั้นลง โดยวัดความยาวของ Telomere ที่อยู่ภายในเซลล์เม็ดเลือดขาว

- จากการศึกษาพบว่า ผู้ที่มี Lifestyle ที่ดี ได้แก่อาหารที่มีประโยชน์ ออกกำลังกายและไม่เครียด จะมี Telomere ที่ยาวกว่ากลุ่มควบคุม

- Telomere ยังอาจจะบ่งชี้ถึงสุขภาพนอกเหนือไปจากอายุขัย เพราะพบว่า Telomere ในผู้ป่วยโรคเรื้อรังเช่น เบาหวาน สมองเสื่อมหรืออัลไซเมอร์ และโรคหัวใจ จะมีขนาดสั้นกว่าคนปกติ

Telomere and Physical Activity

- Telomere length is associate with increase moderate to vigorous Physical Activity level in leisure time

- Arch Intern Med 2008: Lynn F. Cherkas et al.

- 3 hours/week exercise : 9 years younger compare to least active

- 100 mins/week exercise : 5-6 years younger compare to least active

- 16 mins/week : least active

Telomerase

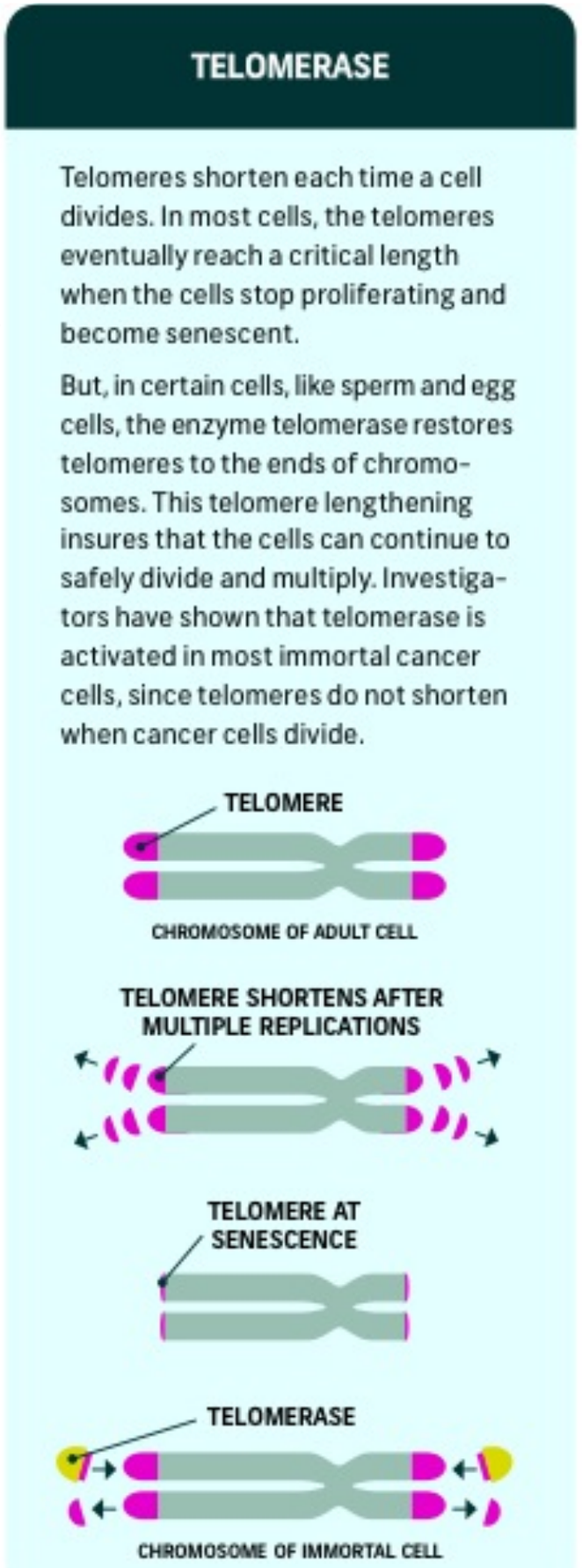
- Professor Elizabeth Blackburn
- Nobel Prize in Physiology or Medicine year 2009 sharing with Carol W Greider and Jack W. Szostak
- Discover" Tolomerase " the enzyme that replenish telomere
- Telomerase reserch in Longevity & Cancer

Telomerase

- หรือ telomere terminal transferase, เป็นเอนโซม์ที่ทำหน้าที่รักษา Telomere ไม่ให้หดสั้นลง

Professor Elizabeth Blackburn' s Interview

- " But telomerase is a double-edged sword, because it has the potential to fuel the growth of any cancer cells already lurking in the body. So we wouldn't want to just wantonly dial up a person's levels. Instead, we're studying the habits of people who have longer telomeres. We think there are lifestyle factors that boost telomerase naturally such as diet high in omega-3 fatty acids is one of the clearest examples. Exercise that is enough to make you break a sweat"



What can we do with Telomere & Telomerase?

- Increase vigorous exercise or yoga
- Healthy diet: low fat, less red and processed meat, vitamins
- Loose weight if over weight
- Reducing psychological stress and depression

Psychoneuroendocrinology. 2011 Jun;36(5):664-81. doi: 10.1016/j.psyneuen.2010.09.010. Epub 2010 Oct 29.

Intensive meditation training, immune cell telomerase activity, and psychological mediators.

Jacobs TL, Epel ES, Lin J, Blackburn EH, Wolkowitz OM, Bridwell DA, Zanesco AP, Aichele SR, Sahdra BK, MacLean KA, King BG, Shaver PR, Rosenberg EL, Ferrer E, Wallace BA, Saron CD.

UC Davis Center for Mind and Brain, Davis, CA 95618, USA. tljacobs@ucdavis.edu

Abstract

BACKGROUND: Telomerase activity is a predictor of long-term cellular viability, which decreases with chronic psychological distress (Epel et al., 2004). Buddhist traditions claim that meditation decreases psychological distress and promotes well-being (e.g., Dalai Lama and Cutler, 2009). Therefore, we investigated the effects of a 3-month meditation retreat on telomerase activity and two major contributors to the experience of stress: Perceived Control (associated with decreased stress) and Neuroticism (associated with increased subjective distress). We used mediation models to test whether changes in Perceived Control and Neuroticism explained meditation retreat effects on telomerase activity. In addition, we investigated whether two qualities developed by meditative practice, increased Mindfulness and Purpose in Life, accounted for retreat-related changes in the two stress-related variables and in telomerase activity.

METHODS: Retreat participants (n=30) meditated for ~6 h daily for 3 months and were compared with a wait-list control group (n=30) matched for age, sex, body mass index, and prior meditation experience. Retreat participants received instruction in concentrative meditation techniques and complementary practices used to cultivate benevolent states of mind (Wallace, 2006). Psychological measures were assessed pre- and post-retreat. Peripheral blood mononuclear cell samples were collected post-retreat for telomerase activity. Because there were clear, a priori hypotheses, 1-tailed significance criteria were used throughout.

RESULTS: Telomerase activity was significantly greater in retreat participants than in controls at the end of the retreat ($p<0.05$). Increases in Perceived Control, decreases in Neuroticism, and [illegible] Mindfulness and Purpose in Life were greater in the retreat group ($p<0.01$). Mediatio[illegible]se was mediated by increased Perceived Control a[illegible] Neuroticism were both partially medi[illegible] in Life directly mediated the telom[illegible]

CONCLUSIONS: This is the fi[illegible] Although we did not measure [illegible] decreases in negative affectivit[illegible] immune cell longevity. Further, P[illegible] control and negative emotionality, af[illegible]

PMID: 21035949 [PubMed - indexed for MEDLINE]

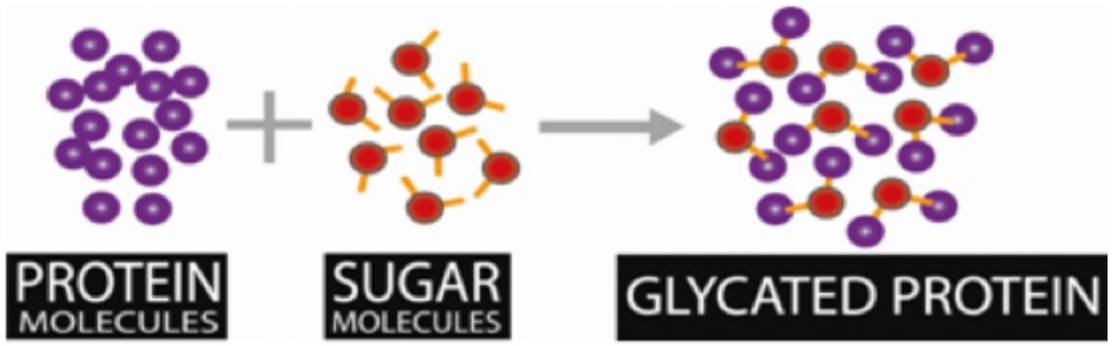
Intensive meditation for 3 months helps relieve stress & increase telomerase activity

Glycation

- Simple sugar bind to molecule of protein, lipid causing toxic substance called Advanced Glycation End Products (AGEs)

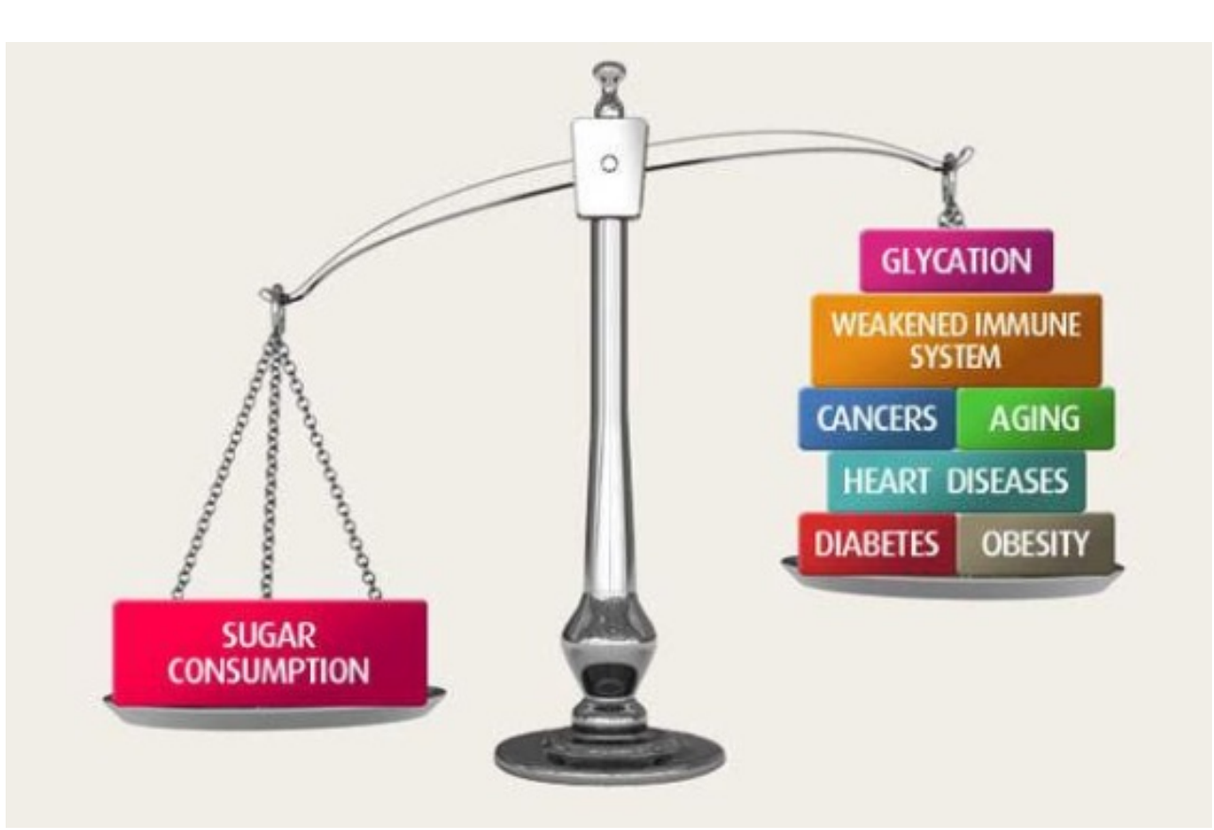
- Can occur exogenous & endogenous

- Related to chronic disease : Diabetes, CAD, Alzheimer, Cancer, etc



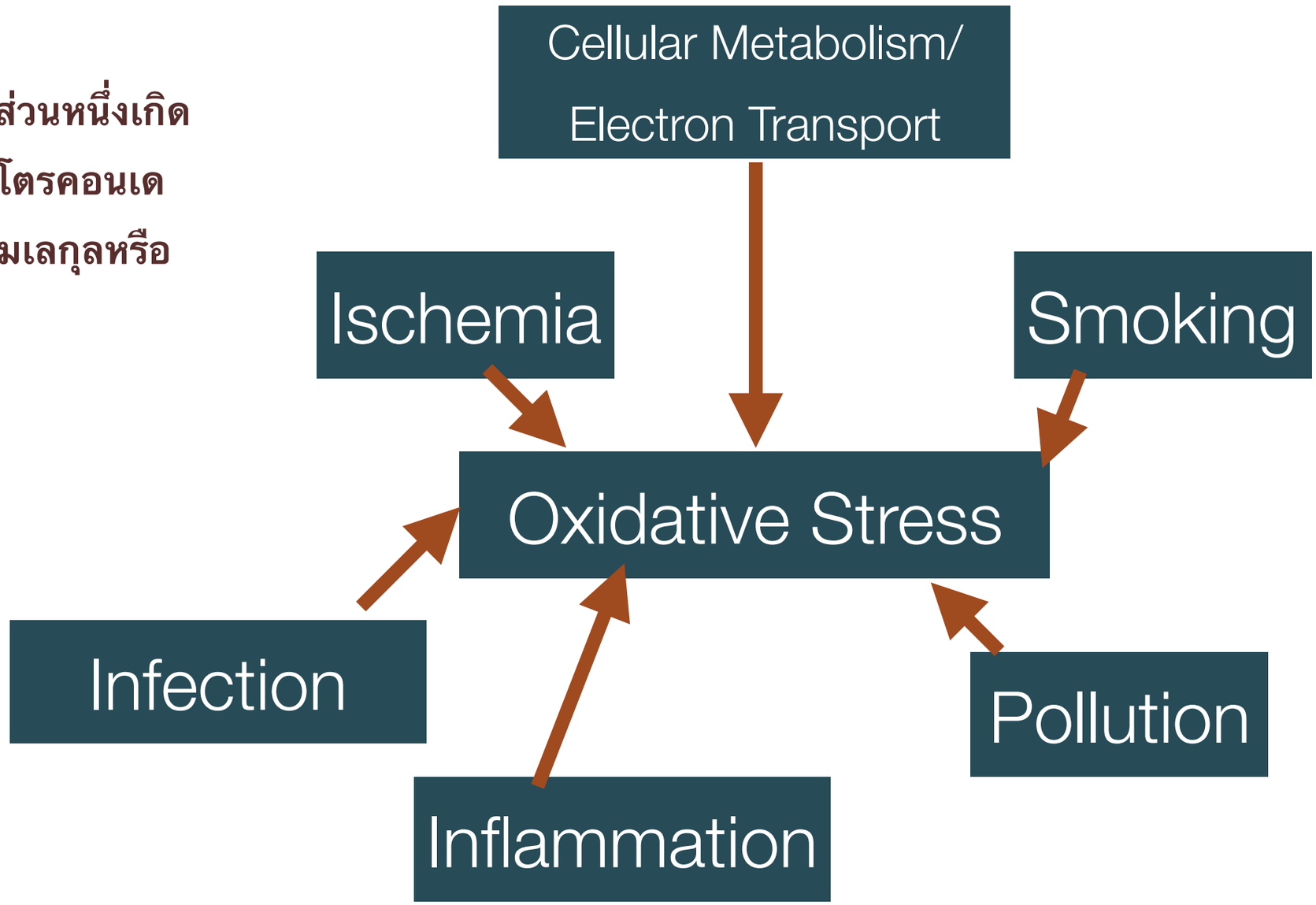
How to prevent AGEs?

- Healthy Diet: anti inflammatory diet
- Avoid carbohydrate that course rapid increase in blood sugar/ control blood sugar
- Cooking with low heat and maintain the water content of food : steaming, boiling or stews
- Avoid excessive heat when cooking: fried, grilled

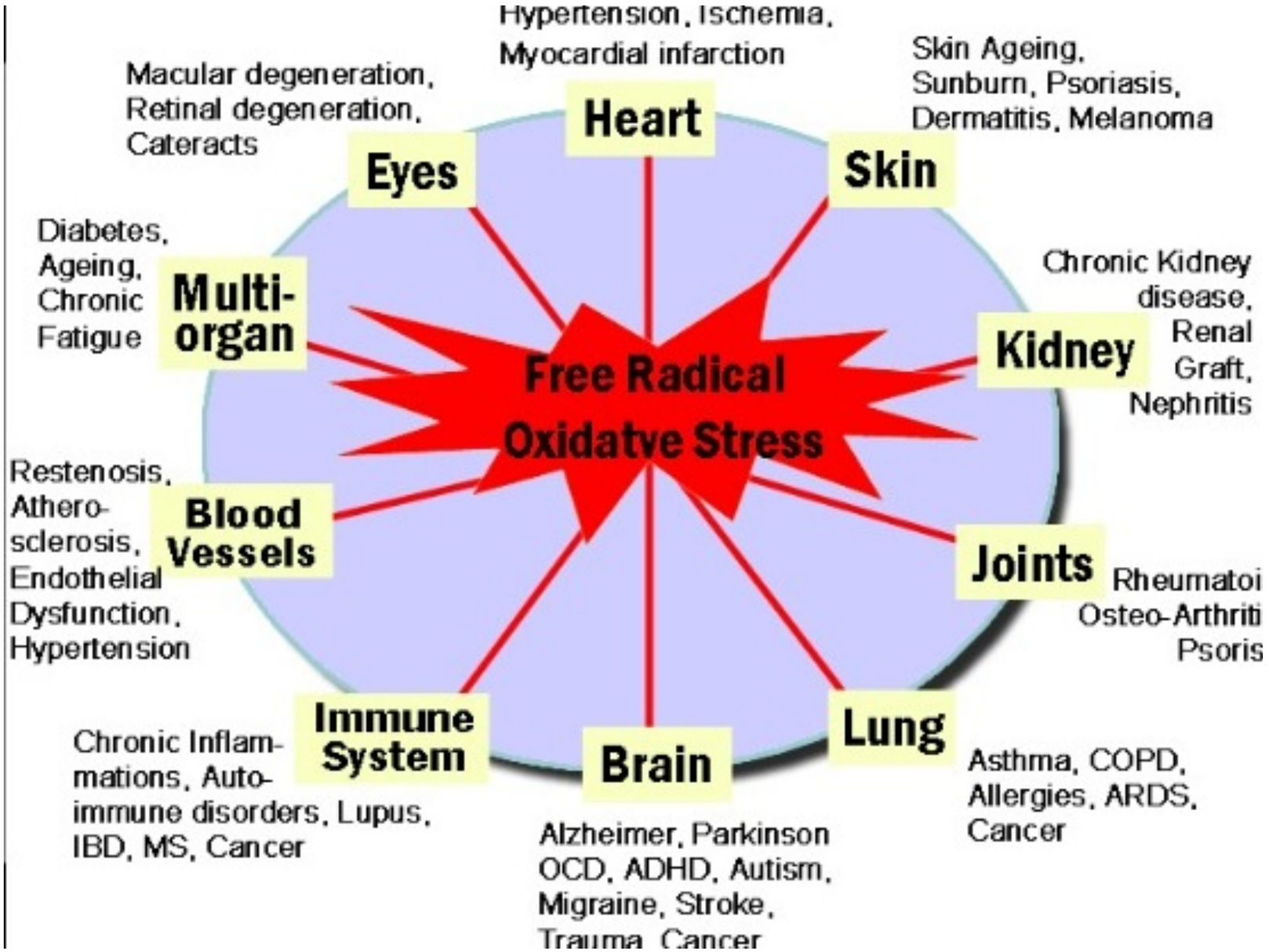


Free Radical

อนุมูลอิสระ เป็น โมเลกุลที่ไม่เสถียร ส่วนหนึ่งเกิดจากขบวนการเผาผลาญอาหารในไมโตรคอนเดรีย เกิดสารประกอบที่มีออกซิเจนในโมเลกุลหรือ reactive oxygen species



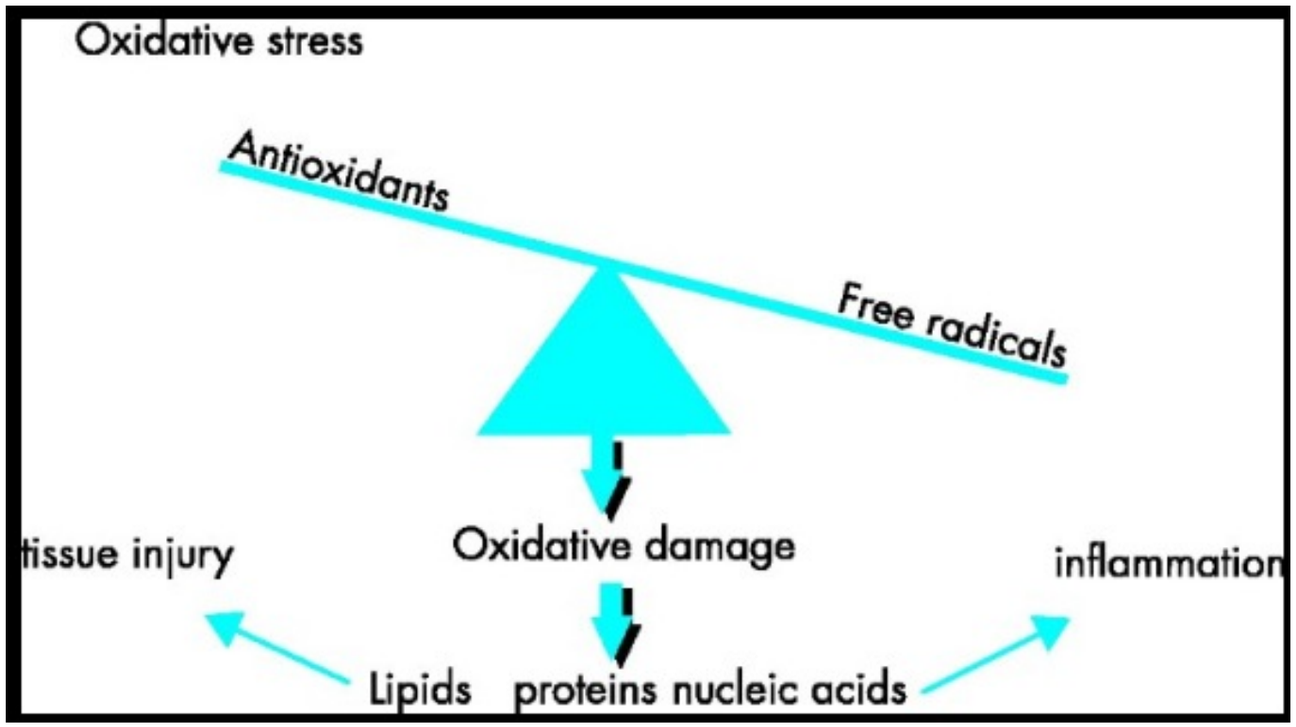
Free radical & Health



Anti-oxidant

- Antioxidants – Compounds that may protect cells from oxygen free radicals by preventing or slowing the process of oxidation
- Non-enzymatic, Enzymatic
- Example of anti-oxidant

Vit C, Vit E, Glutathione, Uric acid, CoQ10, Carotene, Lipoic acid, Flavonoid , etc



Formox Test for Oxidative stress/ Anti Oxidant

[ ] นาย (Mr.) [ ] นาง (Mrs.) [ ] น.ส. (Ms.)

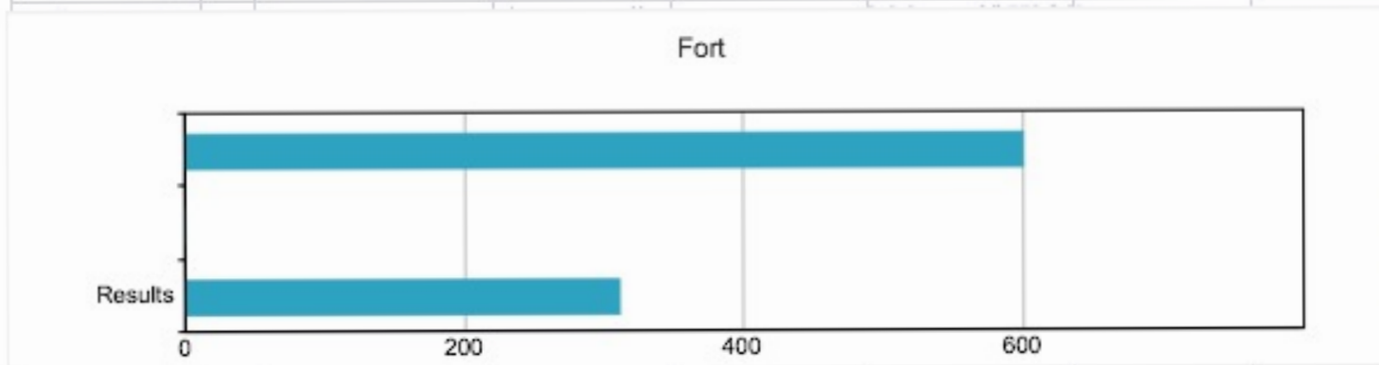
วันที่ (Date) : _____

ชื่อ (Name) : _____

อายุ (Age) : _____ ปี (year)

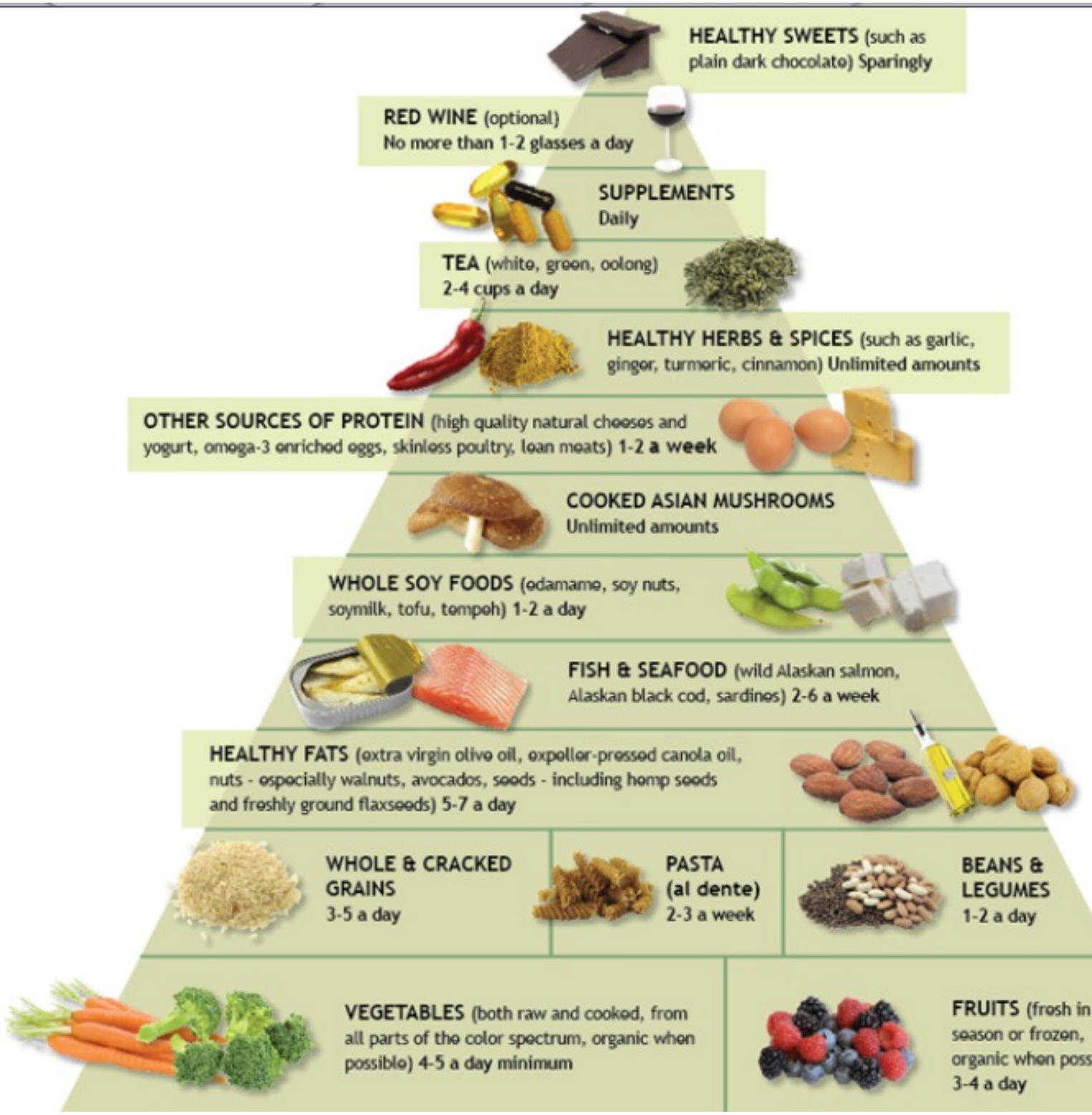
ผลการวิเคราะห์ / Results

Free radical level			600		FORT Units
(ระดับอนุมูลอิสระ)					
Normal values		0 -	310		FORT Units

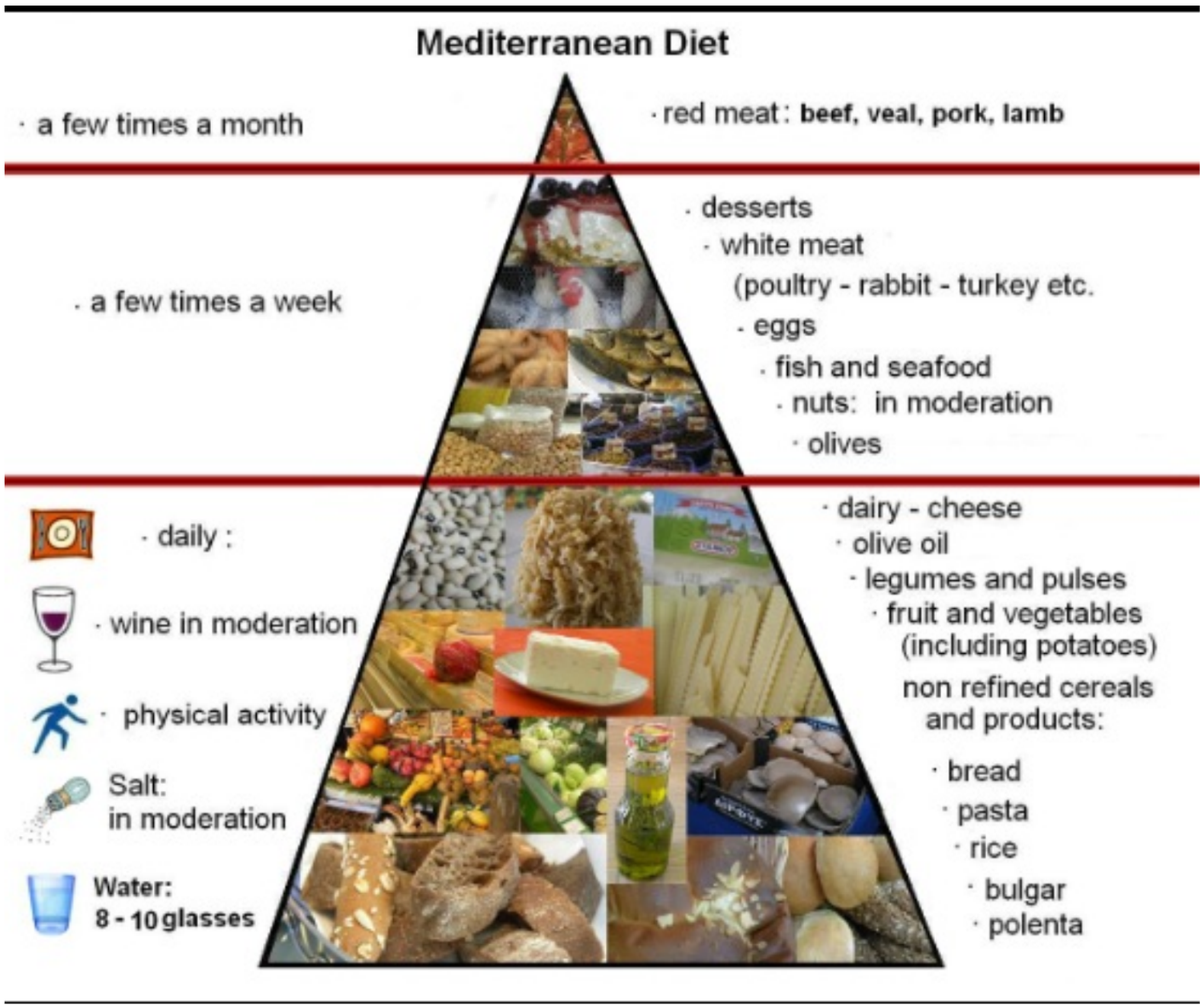


Antioxidant level			0.98		mmol/L Trolox
(ระดับสารต้านอนุมูลอิสระ)					
Normal values		1.07 -	1.53		mmol/l Trolox
(ระดับปกติ)					

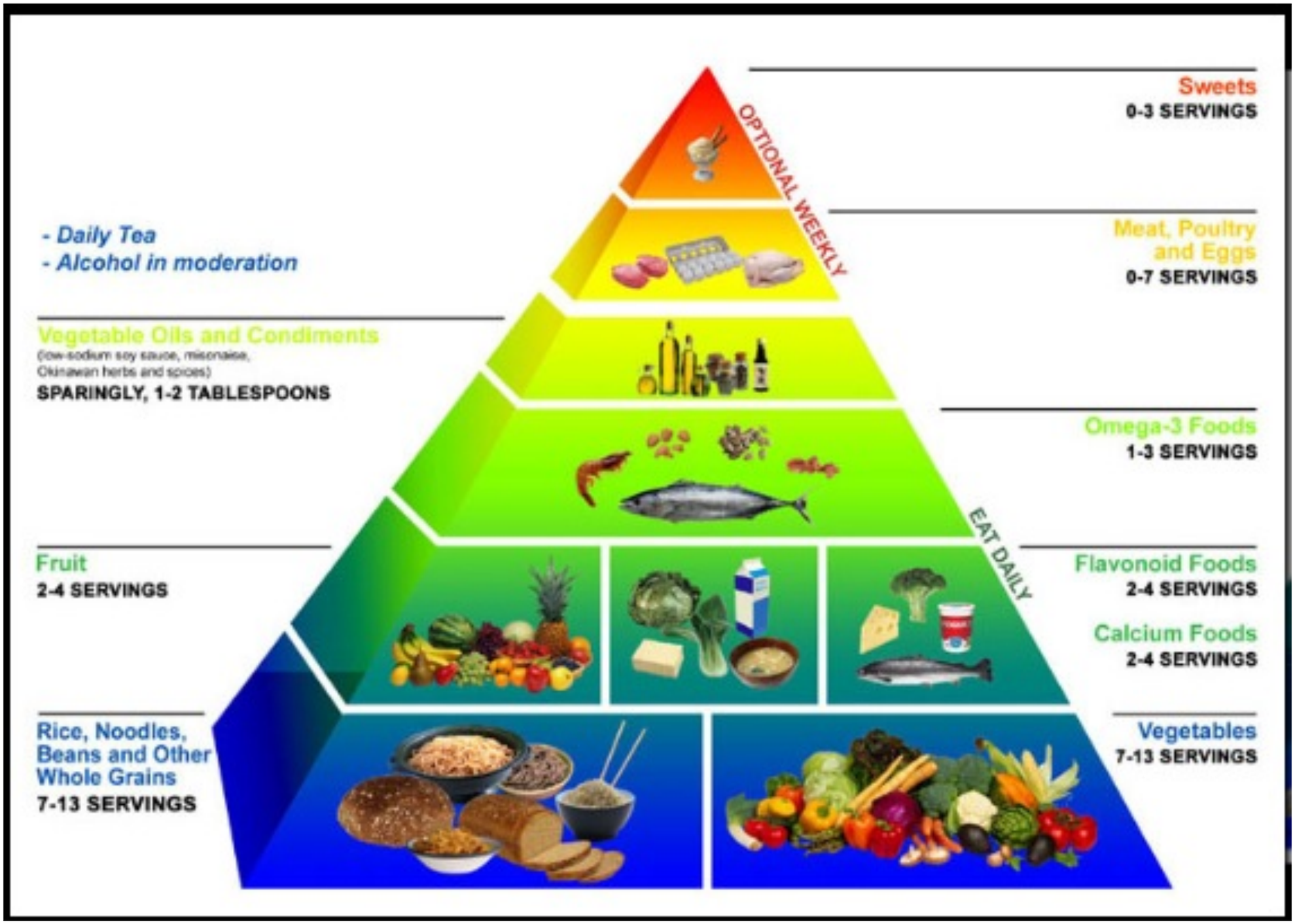
Anti-Inflammatory Diet



Mediterranean Diet



Okinawa Diet



Personalized Supplement

VitechPro
SOLUTIONS FOR PREVENTIVE MEDICINE AND ANTI-AGING PROFESSIONALS

Antioxidants Profile

Test	Result	Level	Normal Range	Units
CoEnzyme Q10	1.7	Excellent	0.18 - 2.70	µM
α - Tocopherol (Vit E)	36.58	Moderate	17.61 - 71.36	µM
γ - Tocopherol	2.92	Moderate	0.51 - 8.23	µM
Lycopene	0.82	Excellent	0.11 - 1.37	µM
β - Carotene	0.97	Moderate	0.12 - 3.78	µM
α - Carotene	0.21	Moderate	0.02 - 0.58	µM
Vitamin A (Retinol)	2.21	Excellent	1.06 - 3.09	µM
Ascorbate (Vitamin C)	53.94	Low	19.25 - 130.25	µM

VitechPro
SOLUTIONS FOR PREVENTIVE MEDICINE AND ANTI-AGING PROFESSIONALS

Vitamin & Mineral Profile

Test	Result	Level	Normal Range	Units
Folic Acid	22.2	High	3.6- 20	ng/ml
Vitamin B12	610	Normal	180 - 914	pg/ml
Chromium	0.3	Low Normal	0.12 - 2.1	µg/l
Copper	101	Normal	70 - 140	µg/dl
Ferritin	346	High	23.9 - 336.2	ng/ml
Magnesium	1.8	Low Normal	1.8 - 2.5	mg/dl
Selenium	103	Normal	46 - 143	µg/l
Zinc	112	Good	70 - 120	µg/dl

Supplement: daily : Dr. Andrew Weil

- **Multivitamin :**

1. Mixed carotenoid including Lutein, Lycopeneat least folic acid 400 mcg, 1,000 IU of Vit D

2. Mixed , natural Vitamin E 400 IU

3. Provide 50 mg each of Vitamin B (except Vitamin B12 , atleast 50 mcg) , Folic acid at least 400 mcg

4.Vitamin C 200 mg/day

5. Vitamin D 1,000 IU

6. Selenium 200 mcg

- **Calcium: Woman (prefer calcium citrate form) 500-700 mg,Men: not more than 700 mg from all sources and no need for supplement**
- **Co-Q10: 60-100 mg , take with meals, soft gel**
- **Grape Seed Extract: 100 mg if not enough diet rich with flavonoid**
- **ALA (alpha lipoic acid) 100/400 mg if prone to metabolic syndrome**
- **Ginger / Turmeric if not regularly eating fresh one**
- **Fish oil 1-2 gram if not eating oily fish at least twice a week**

Supplement for Brain function: Dr. Andrew Weil

Supplements

- **Daily multivitamin**. A good multivitamin can provide optimal levels of folic acid and other B vitamins, compounds which help lower blood levels of homocysteine, a toxic amino acid linked to increased risks of Alzheimer's disease.
- **Ginkgo**. Extracts of ginkgo tree leaves increase blood flow to the brain and have been shown to slow the progression of dementia in early onset Alzheimer's disease.
- **Phosphatidyl serine, or PS**. This naturally occurring lipid is considered a brain cell nutrient and may have positive effects on memory and concentration. Research has suggested it can help slow age-related cognitive decline.
- **A daily low-dose aspirin**. Aspirin and other nonsteroidal anti-inflammatory drugs (NSAIDs) may reduce the risk of Alzheimer's disease by mediating inflammation. Because NSAIDs can cause stomach irritation, they should always be taken with food.
- **Turmeric**. This natural anti-inflammatory spice may have a specific protective effect against Alzheimer's disease.
- **DHA**. This omega-3 fatty acid, which occurs naturally in cold water fish, is essential for normal brain development, has been linked to healthy cognitive function.
- **Acetyl L-carnitine and alpha lipoic acid.** When combined, as in Weil Juvenon Healthy Aging Support, this energy booster and antioxidant are an evidence-based combination that appears to provide improved mental alertness as well as increased energy.

Dr Weil head to toe wellness guide

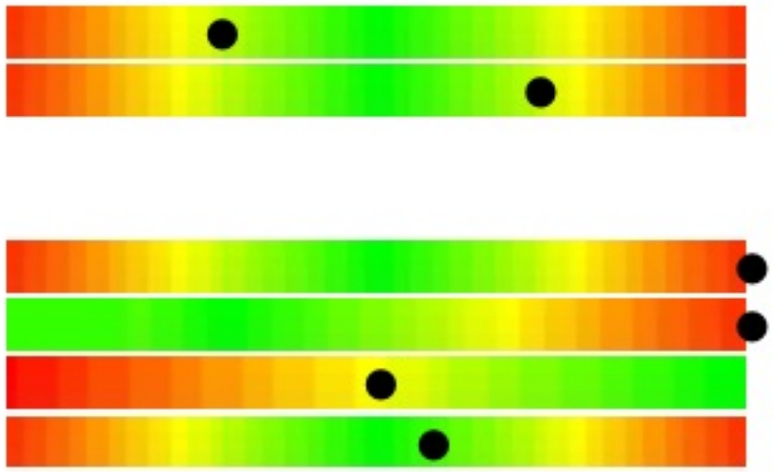
Hormone and Longevity

- Human Growth Hormone
- Estrogen / Progesterone
- DHEA (Dehyrdoepiandrosterone)

Salivary Hormone Test

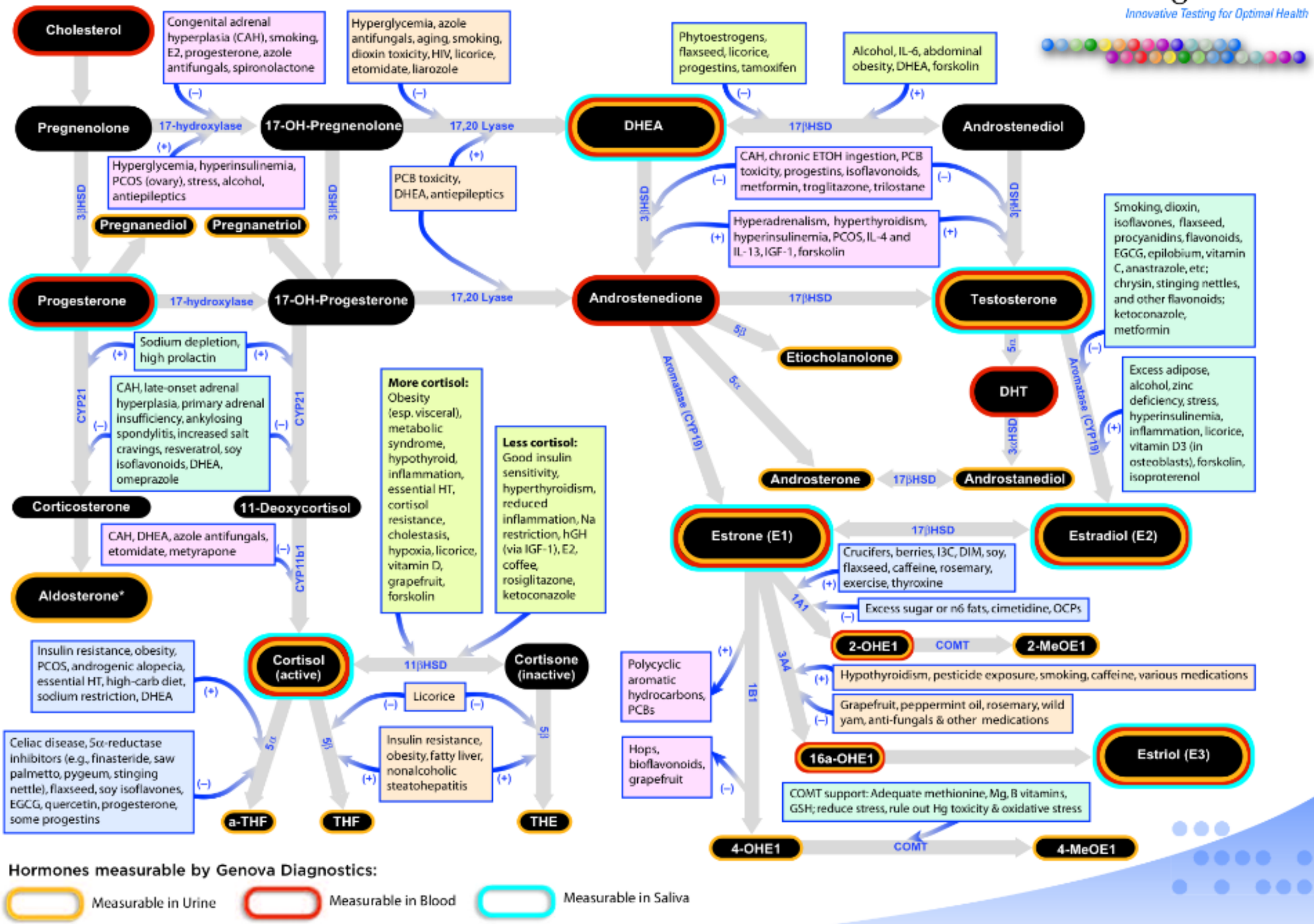
ENDOCRINOLOGY SALIVA

SALIVA	Result	Range	Units
Progesterone (P4)	**482.0**		pmol/L
DHEAS.	**6.2**	2.5 - 25.0	nmol/L
Testosterone.	**169.0**	25.0 - 190.0	pmol/L
Salivary Estrogens			
Estradiol (E2)	**7.0**		pmol/L
Estrone (E1)	***50.0*** ***H**	9.6 - 20.0	pg/mL
Estriol (E3)	***63.0*** ***H**	0.0 - 29.0	pg/mL
E3/[E2+E1]	**1.11**	> 1.00	RATIO
P4/E2 Ratio (Saliva)	**68.9**	4.0 - 108.0	RATIO



Steroidogenic Pathways

Genova Diagnostics
Innovative Testing for Optimal Health



Hormones measurable by Genova Diagnostics:

Measurable in Urine
Measurable in Blood
Measurable in Saliva

Exercise and Longevity

Exercise improve Longevity

Janssen I , et al. Years of life gained due to leisure-time physical activity in the U.S. Am J Prev Med 2013

Kim JH, et al. Habitual physical exercise has beneficial effects on telomere length in post menopausal woman. Menopause 2012.

Du M, et al. Physical activity, sedentary behavior and leukocyte telomere length in woman. Am J Epidermiol 2012.

Longevity:West Side Story

- Life Style : diet, exercise, stress reduction
- Supplement?
- Hormone?
- Gene?
- Stem Cell?

พุทธวจน: 5 เหตุปัจจัยที่ทำให้คนอายุยืน

พระอาจารย์คึกฤทธิ์ โสตฺถิผโล วัดนาป่าพง

- ทำความสบายให้กับตนเอง
- ให้รู้ประมาณในความสบาย
- บริโภคอาหารที่ย่อยง่าย
- เที่ยวในกาลที่สมควร
- ประพฤติเพียรดั่งพรหม ทำสมาธิ เจริญเมตตาภาวนา