



Glutathione's New Data

(L-Glutathione Reduced)

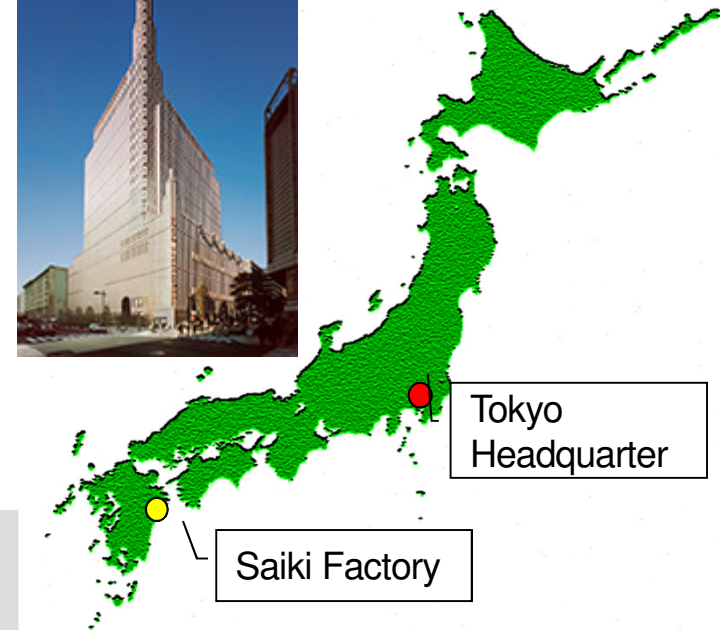
Oral Absorption, Skin Beauty

1. General Introduction

Corporate Profile

- ❑ Establishment: 1937
- ❑ Employees: 217
- ❑ A group of  Mitsubishi Corporation
- ❑ Manufacturing food ingredients, APIs, feed, chemicals, and etc.
- ❑ Specialized in **Fermentation**
- ❑ Products:

GLUTATHIONE	Pharmaceutical and health food (improving liver function, detoxification, anti oxidation, and beauty)
HITHION YH	Glutathione containing Torula yeast extract
Savory Products	Yeast extracts with special features



- ❑ WORLD NO.1 market share
- ❑ Totally NATURAL process -- Fermentation product by U.S. FDA Approved Yeast

- ❑ U.S. FDA GRAS Certified

GRN No. 000293



Generally Recognized As Safe

- ❑ GMP Certified Factory (Japanese Gov.)



- ❑ KOSHER Certified



KC#3721936-1

- ❑ HALAL Certified (MUI/JAKIM)

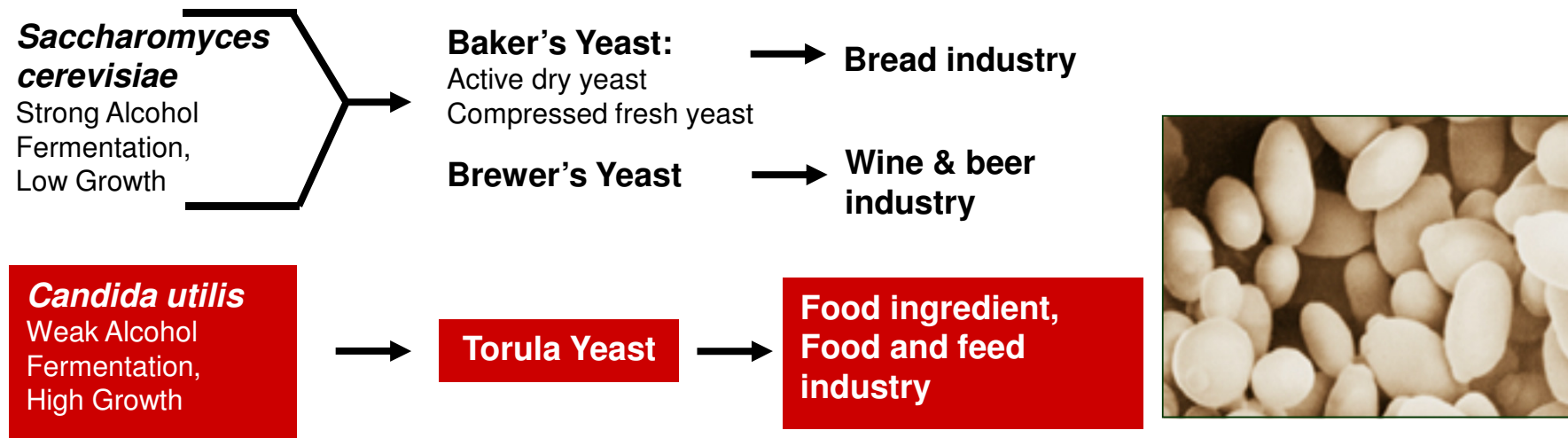
MUI: No. 00310028570304

JAKIM: No. 0100-01-147707



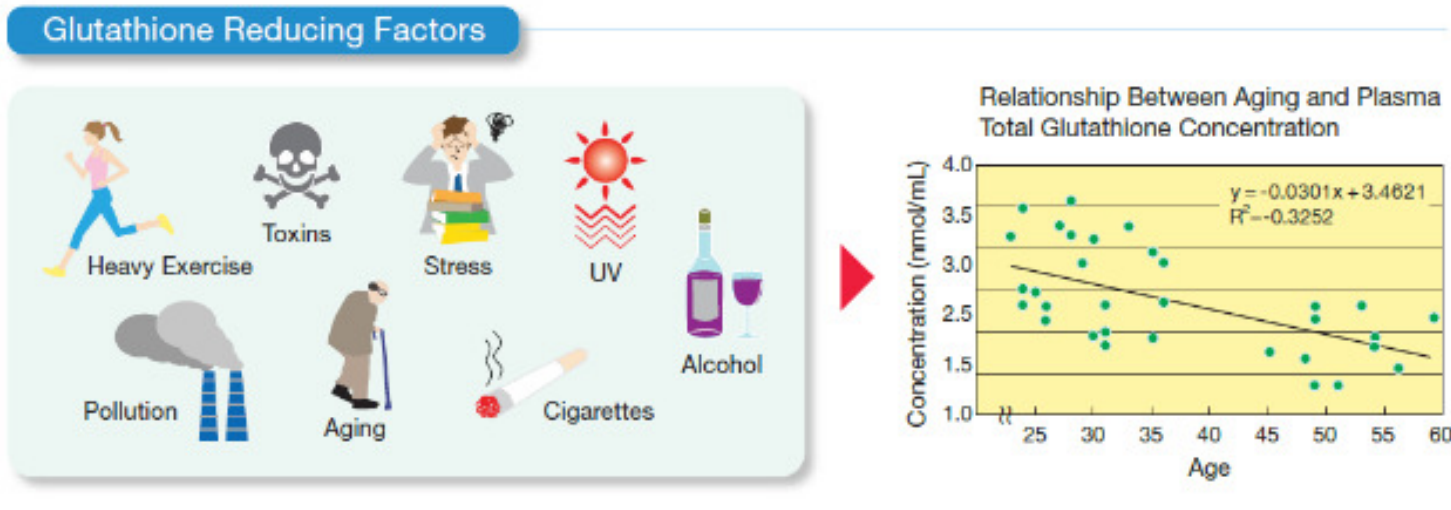
Torula Yeast (*Candida Utilis*)

- ❑ First described by Persoon in 1794.
- ❑ Cosmopolitan in nature and commonly found on dead herbaceous stems, grasses, leaves, sugar beet roots, ground nuts, oats, soils etc.
- ❑ Approved by US FDA as safe supplement. (FDA Code of Federal Regulation 172.896.)
- ❑ In Germany approved as food in 1920.



Glutathione is NOT Infinite...

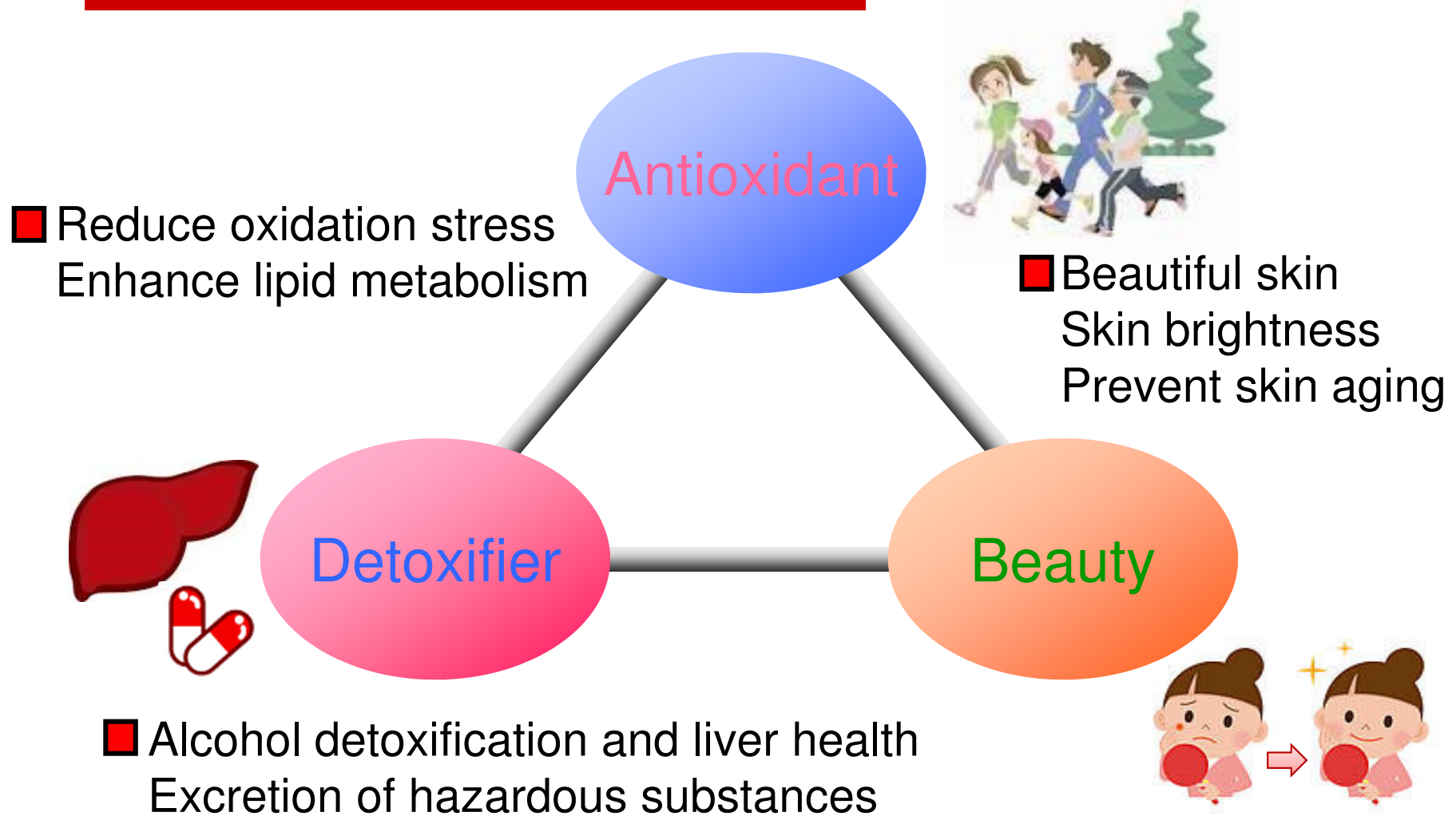
- As we age, there is a precipitous drop in GSH levels.



- Lower Glutathione levels are implicated in many diseases associated with aging...

Journal of Clinical Epidemiology 47: 1021-28 1994

Glutathione is “AID” of Life



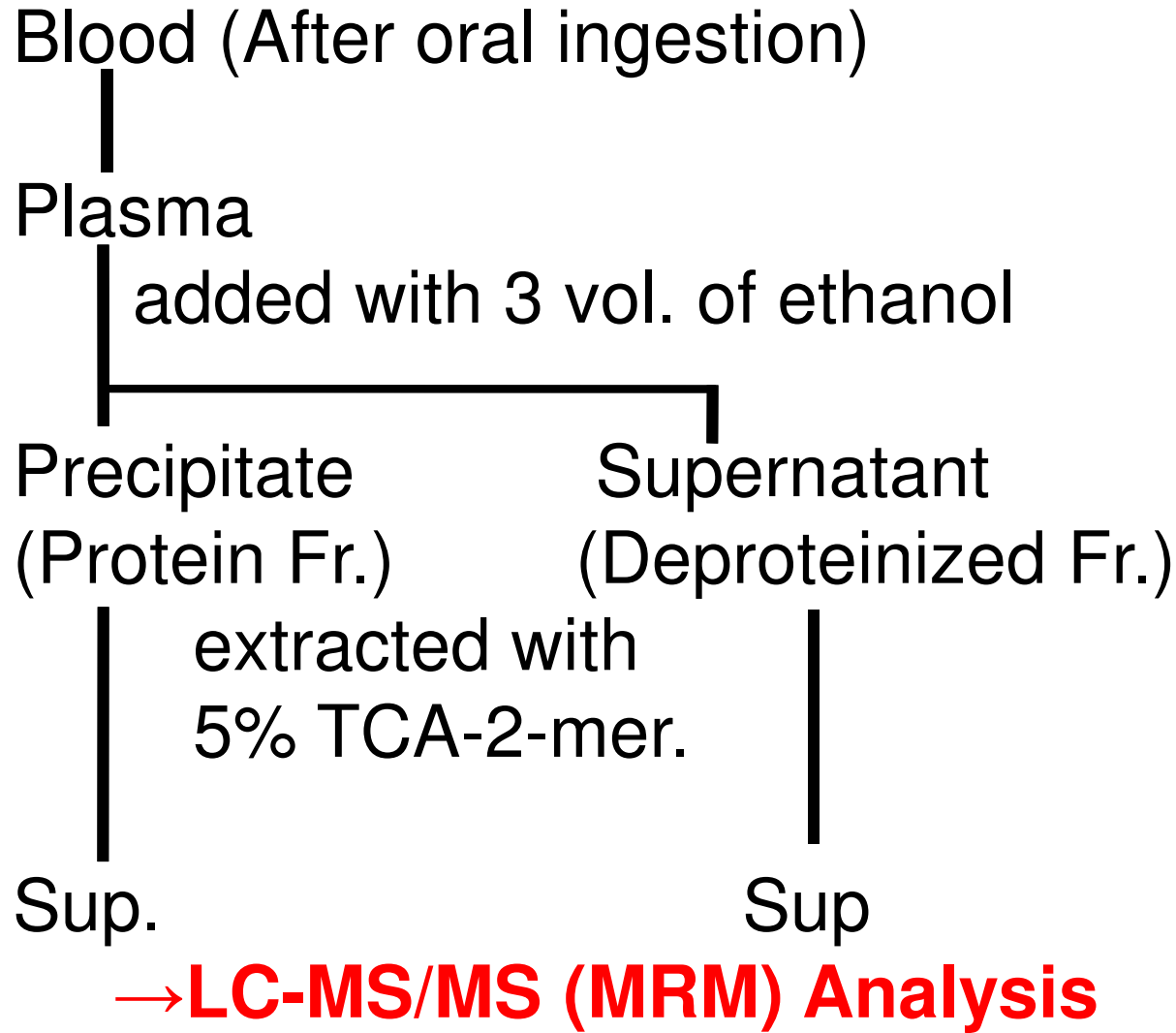
2. Bio Availability of Glutathione

Oral Absorption & New Efficacy

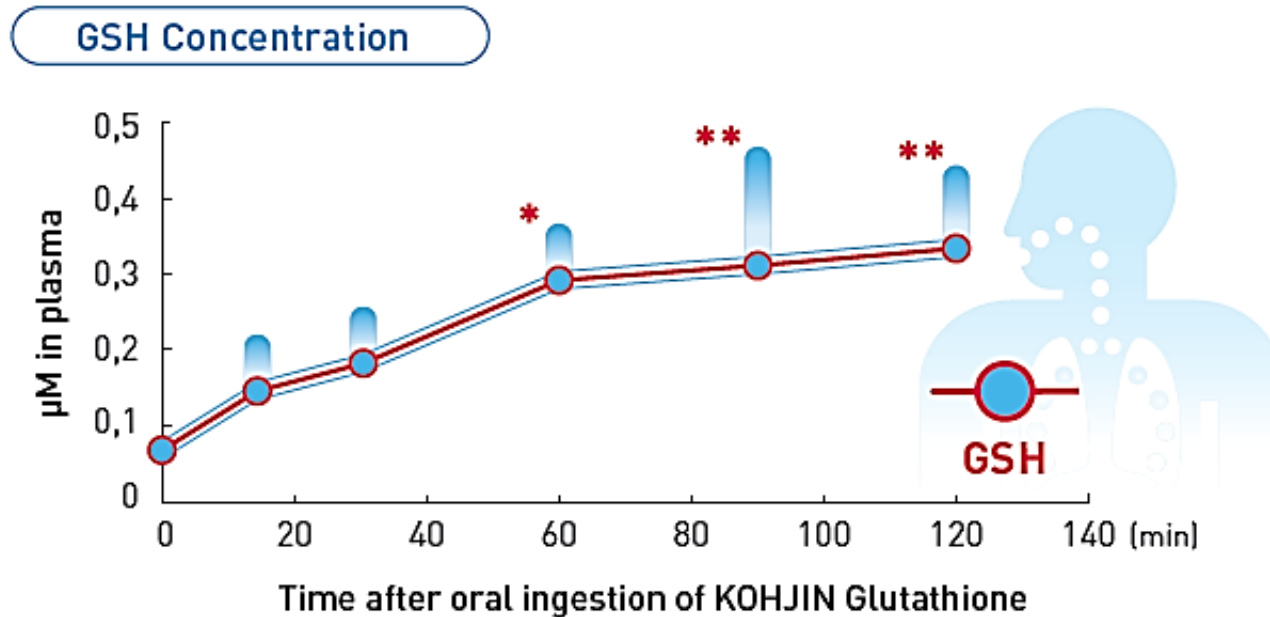
- Injection of glutathione has been applied as medicine to improve liver function and detoxification.
- On the other hand, glutathione or glutathione-containing foods have been used aiming to skin whitening and improvement of liver and mental health etc...
- **Is glutathione absorbed into human body?**

*Papers published in 1990s concluded that glutathione could NOT absorbed by oral ingestion (measured with HPLC method).

Detection Method (Oral Absorption)



Protein Fraction of Plasma in Human trial



Contents of Glutathione (GSH) in the ethanol-precipitate fraction of plasma after oral ingestion of GSH. "*" and "**" indicate significant difference from baseline, $P < 5\%$ and $P < 1\%$ respectively, as calculated using Scheffé's method post hoc.

Park et al, J. Agric. Food Chem (ACS). 62, 6183–6189 (2014)

Oral Absorption (ACS Journal Published)

JOURNAL OF
AGRICULTURAL AND
FOOD CHEMISTRY

Article

pubs.acs.org/JAFC

Increase in the Protein-Bound Form of Glutathione in Human Blood after the Oral Administration of Glutathione

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ABSTRACT: The present study examined the impact of the supplementation of glutathione (GSH), γ -L-glutamyl-L-cysteinyl-glycine, on human blood GSH levels. Healthy human volunteers were orally supplemented with GSH (50 mg/kg body weight). Venous blood was collected from the cubital vein before and after ingestion. Plasma was mixed with 3 volumes of ethanol. The supernatant and precipitate were used for the deproteinized and protein fractions of plasma, respectively. Blood cell and plasma fractions were pretreated with 5% trichloroacetic acid–2% 2-mercaptoethanol to reduce the oxidized form of GSH and liberate protein-bound GSH. The 2-mercaptoethanol-pretreated GSH was determined by precolumn derivatization with 6-aminoquinolyl-N-hydroxy succinimidyl carbamate and liquid chromatography–tandem mass spectrometry. There was no significant difference in GSH contents in the deproteinized fraction of plasma and blood cell fraction after GSH ingestion. However, the GSH contents in the protein-bound fraction of plasma significantly ($P < 0.01$) increased from 60 to 120 min after GSH supplementation.

KEYWORDS: glutathione, GSH, blood, supplementation, oral administration, human trial

 ACS Publications

3. Efficacy for Skin Beauty

Skin Health & Glutathione

❑ Function of Glutathione & Benefits...

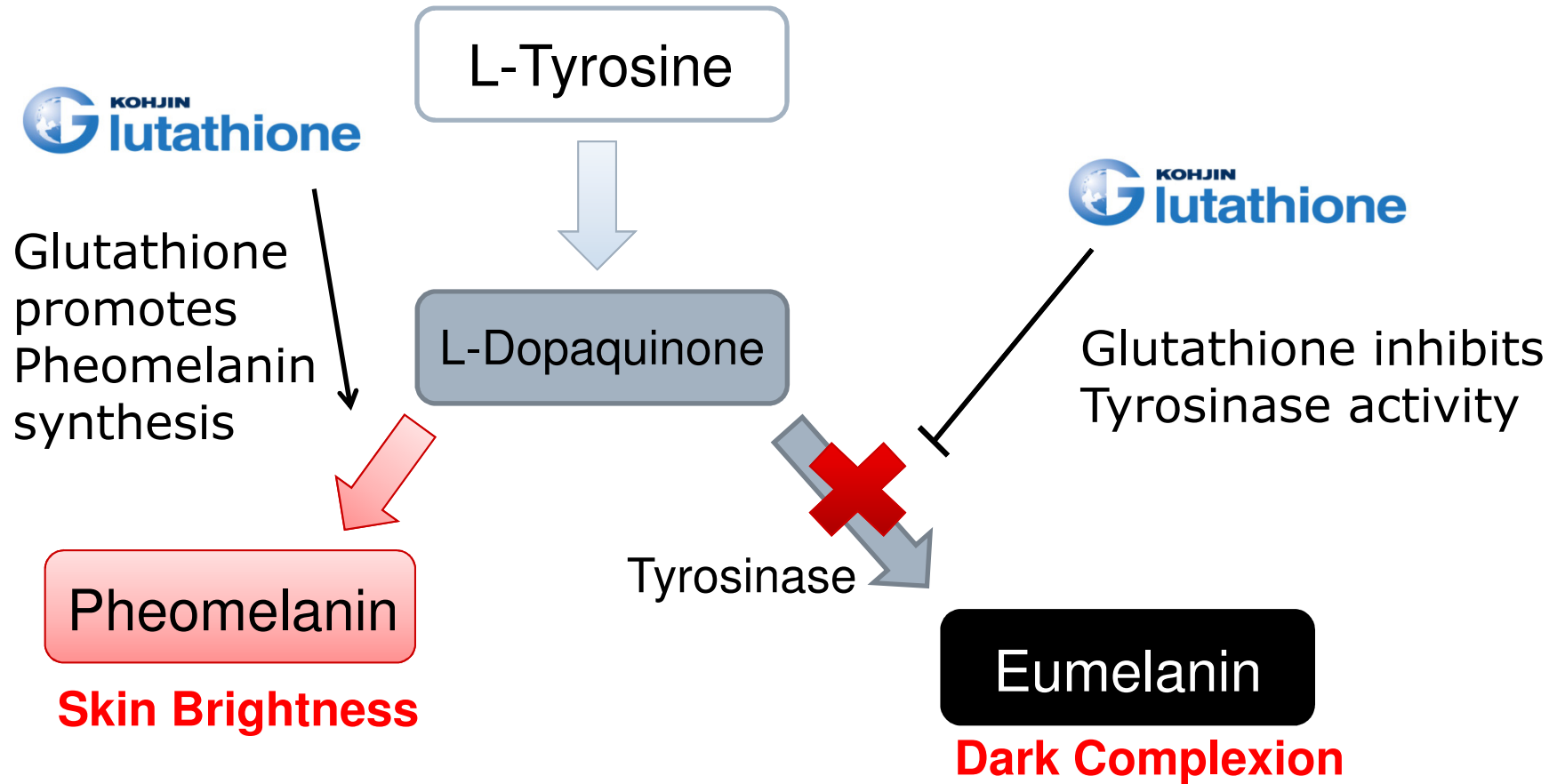


- ❑ Whitens the skin
- ❑ Dark spot remover
- ❑ Prevent and/or remove pimples and pimple marks



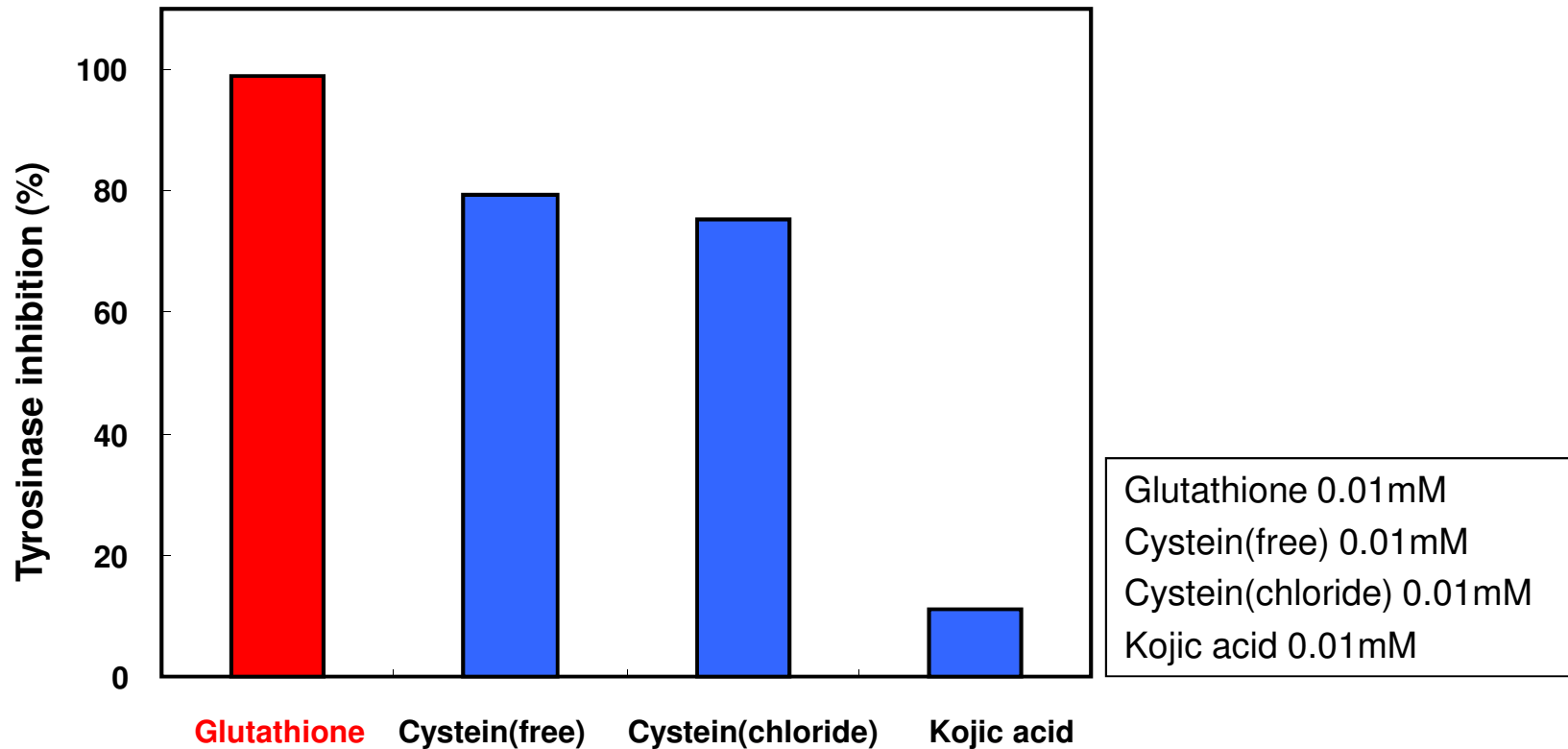
- ❑ Anti-aging and anti-wrinkles
- ❑ Makes skin smooth, fresh and radiant
- ❑ Enhance healing of wounds

Mechanism of Skin Beauty



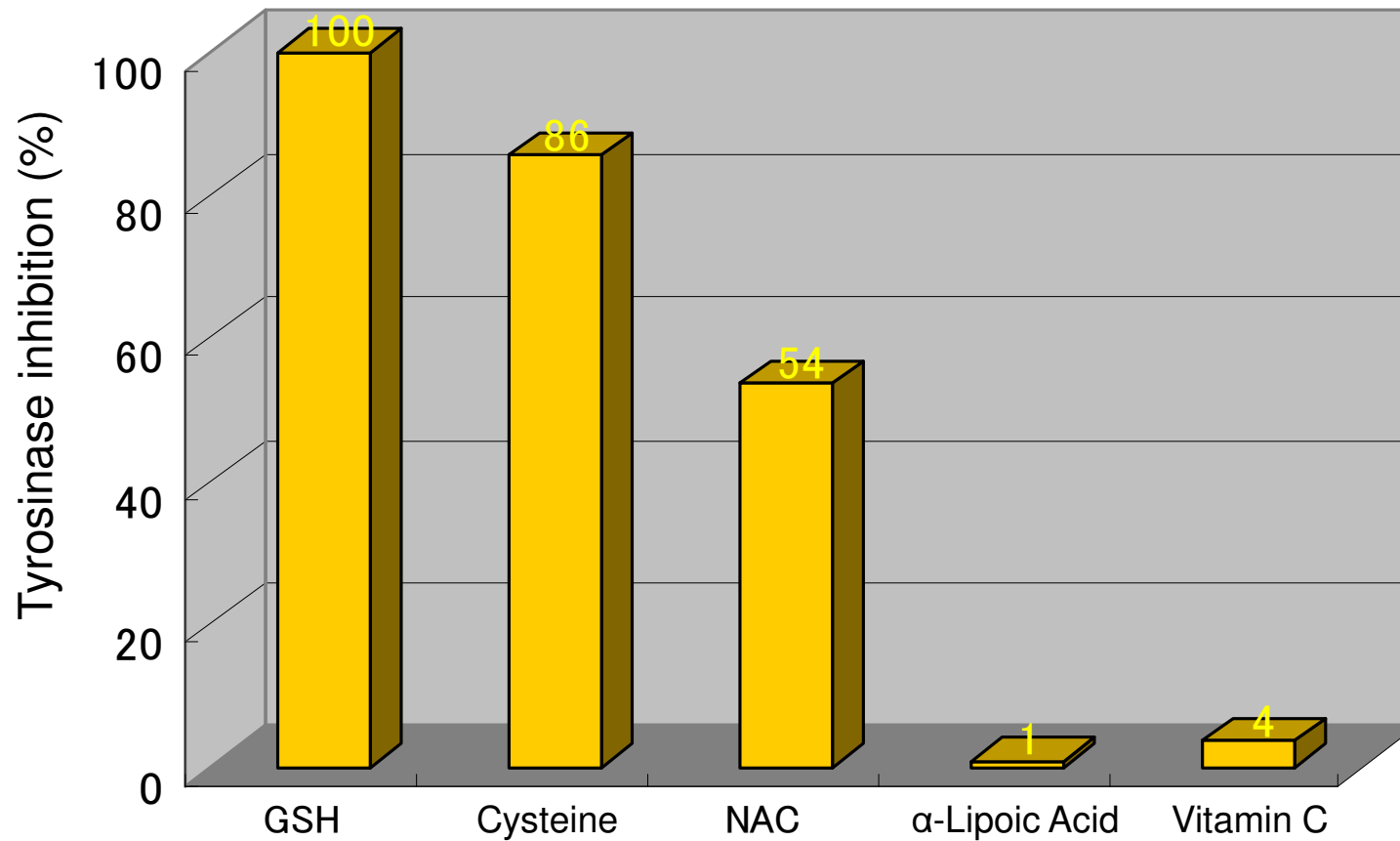
- Glutathione inhibits the Tyrosinase activity and Eumelanin synthesis and increase the ratio of Pheomelanin

Inhibition of Tyrosinase (1)



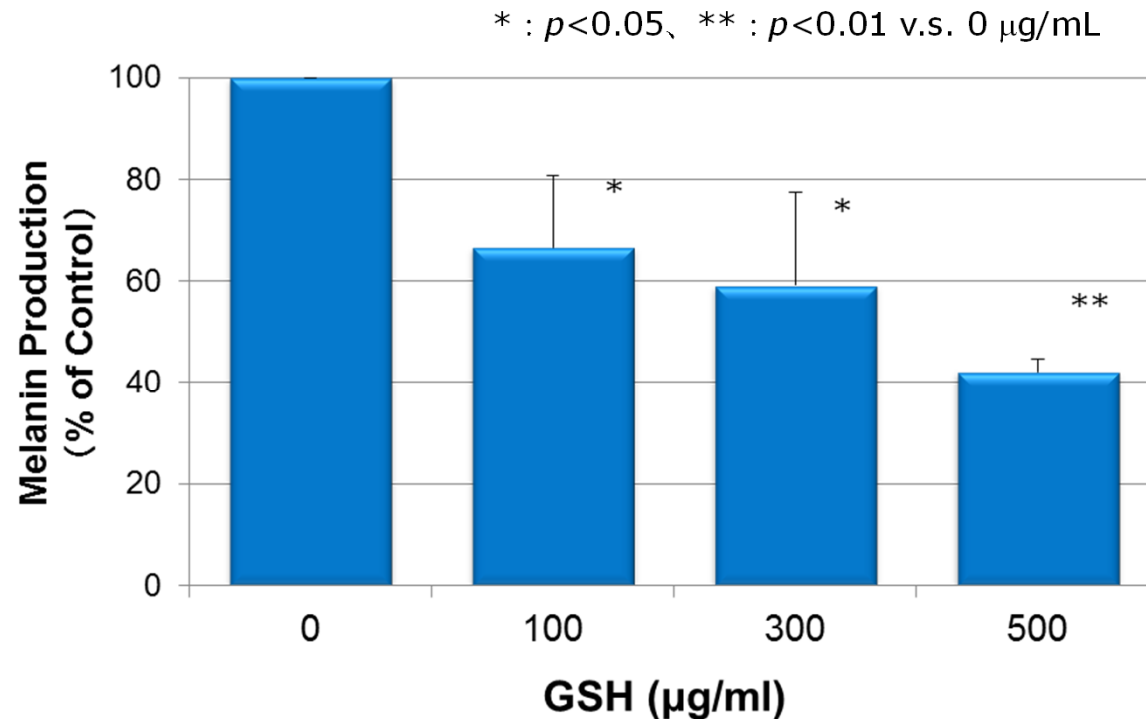
- Glutathione showed the strongest effect to inhibit Tyrosinase activity

Inhibition of Tyrosinase (2)



- ❑ Glutathione has the most effectiveness on Tyrosinase inhibition.

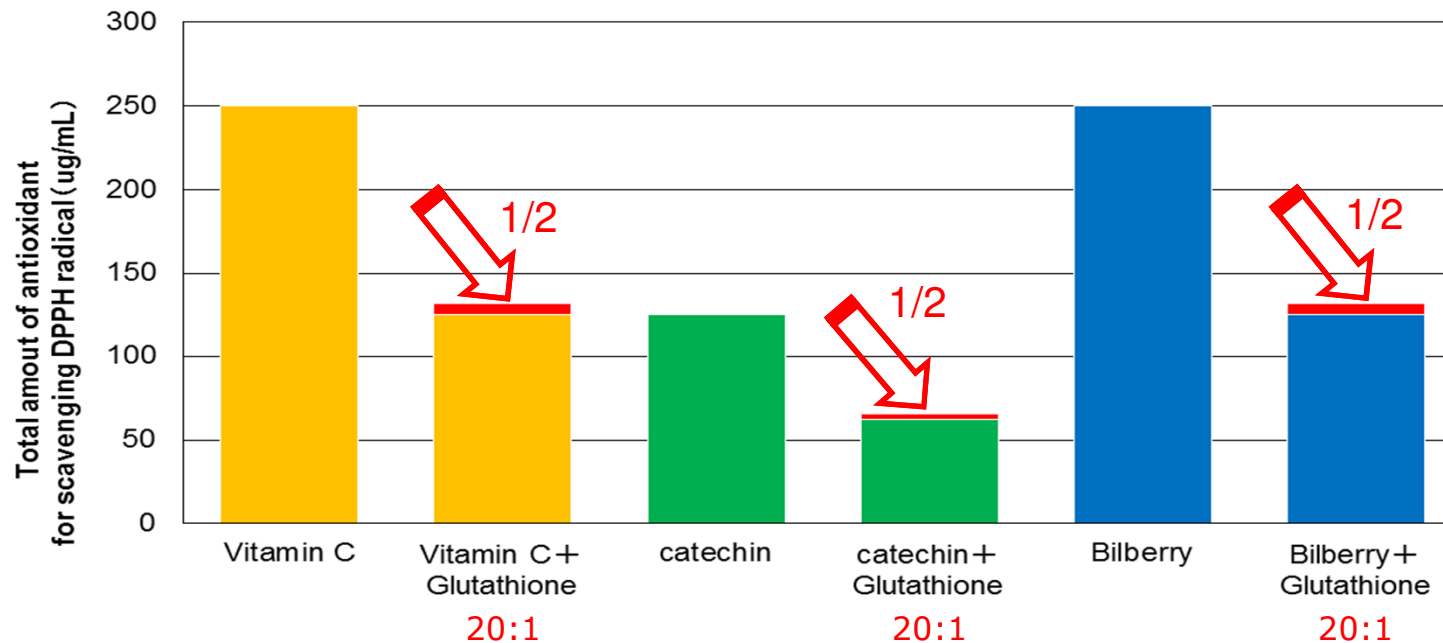
Effect of Melanin Inhibition



- Glutathione can inhibit the melanin production concentration-dependently.

Synergy of Glutathione and Anti-oxidants

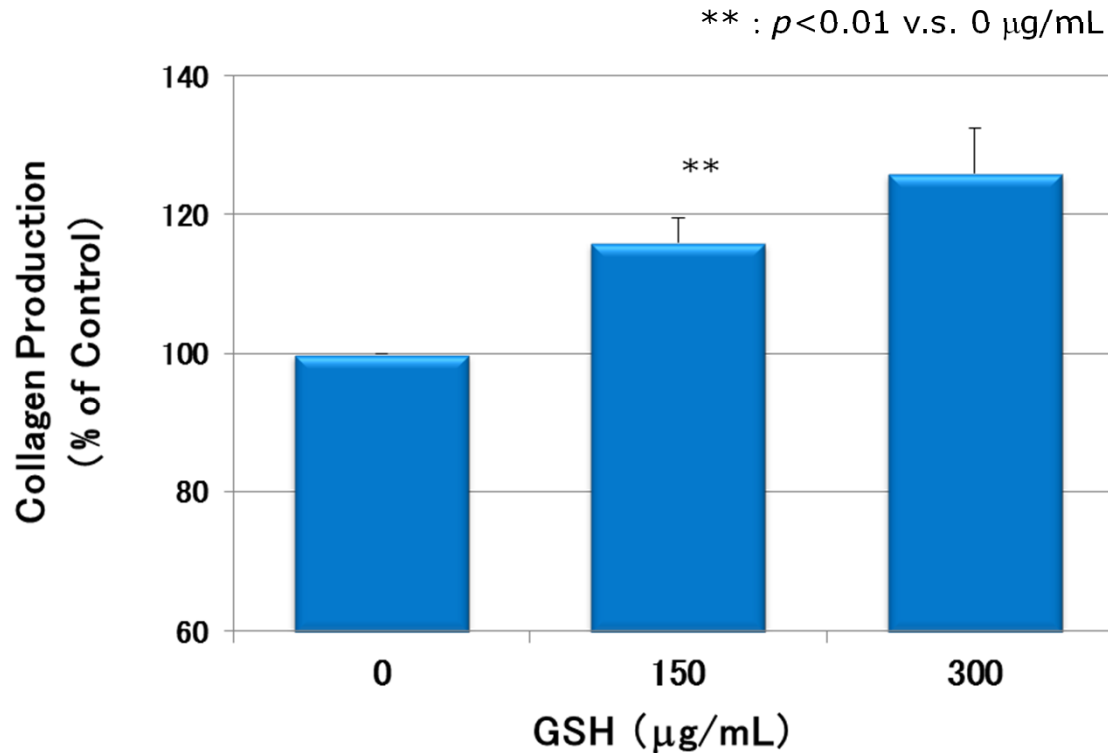
□ DPPH radical scavenging activity



□ By Adding a small amount of Glutathione, the amount of anti-oxidants can be reduced.

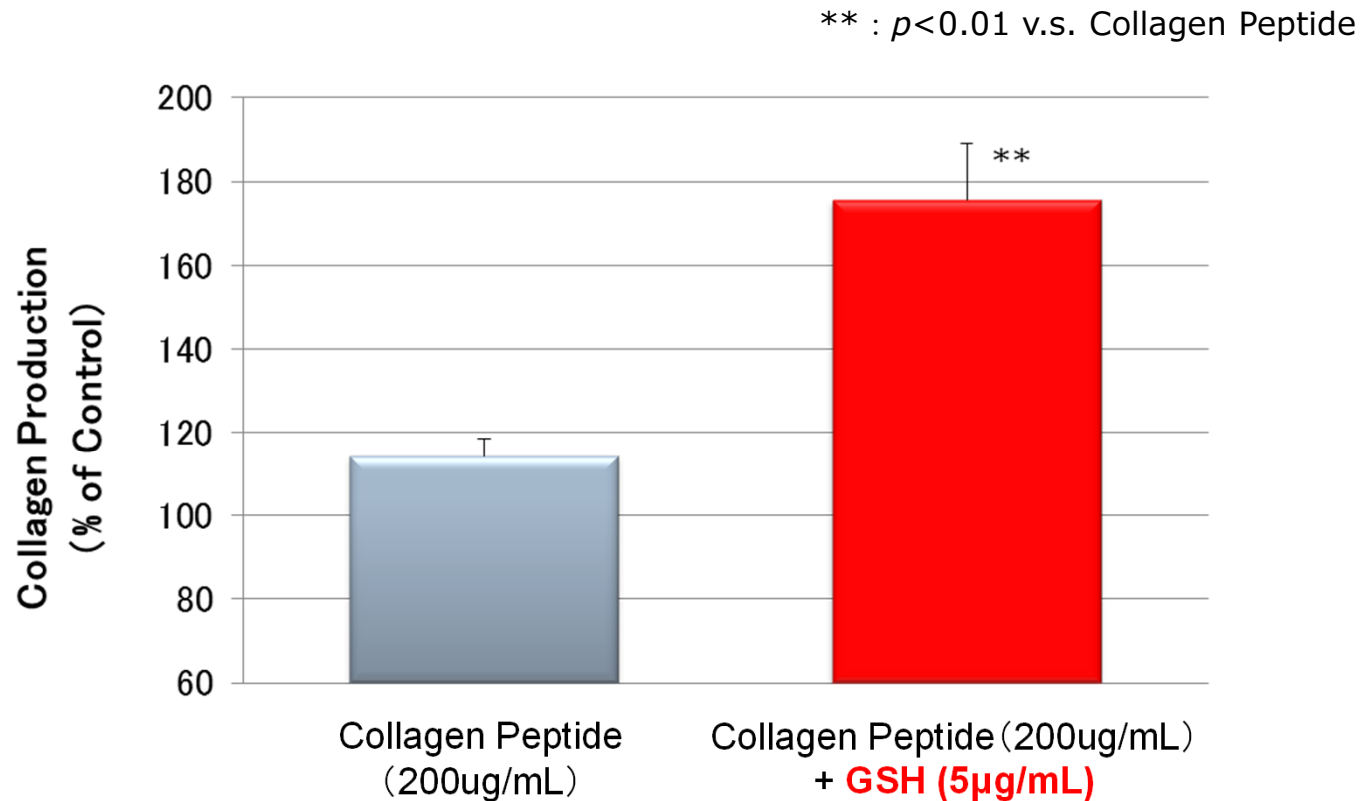
(ex) DPPH radical scavenging activity of mixture (VC 125µg/ml : GSH 6.2µg/ml) has the same effect with VC 250µg/ml.

Enhancement of Collagen Production



- Glutathione can enhance the collagen production concentration-dependently.

Synergistic effect of Glutathione and Collagen

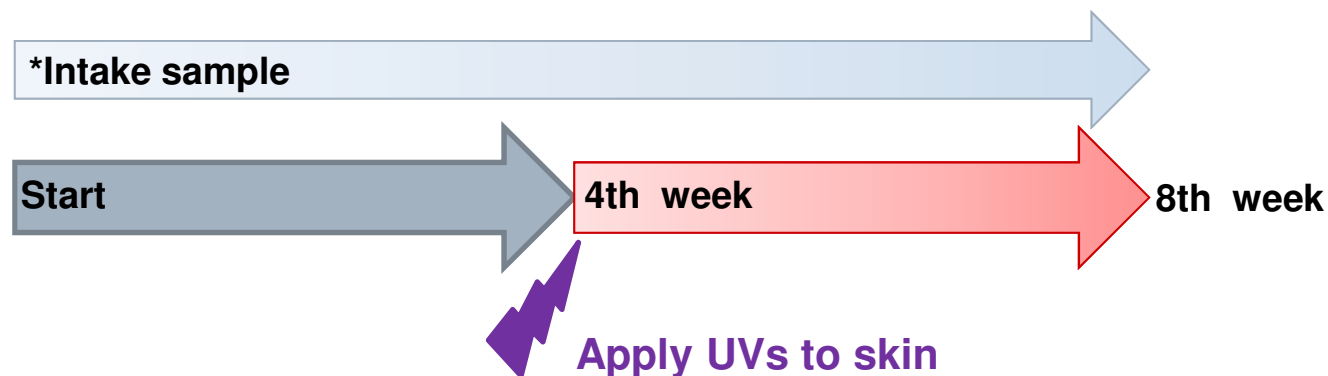


- By adding a small portion of Glutathione, collagen production by collagen peptide can be enhanced.

Clinical Study on Skin Beauty (1)

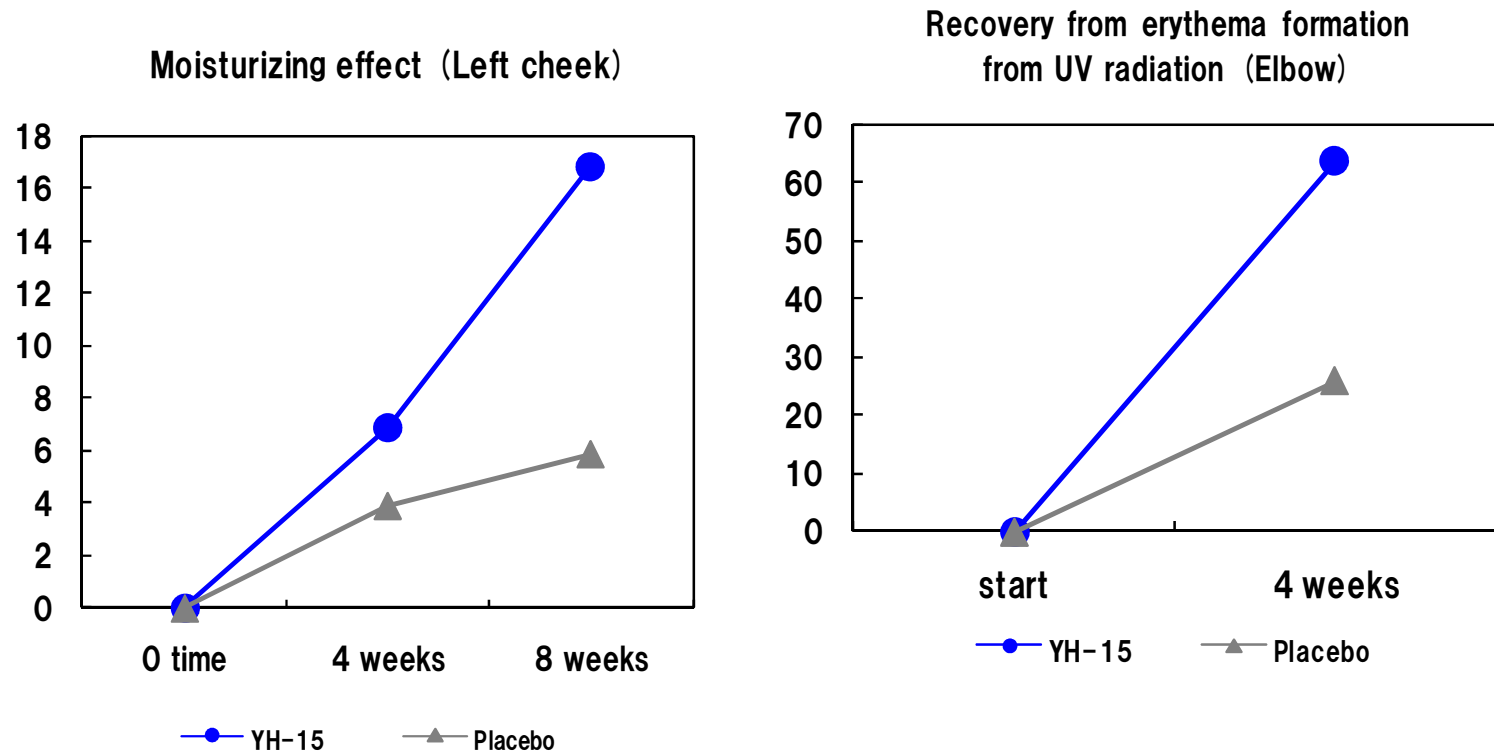
- ❑ Terms of the study: May to July, 2010
- ❑ Subjects of the study: Thirty (30) women, age 20s to 40s
- ❑ Study groups: Placebo group & Glutathione group
- ❑ Sample Glutathione: **50mg, once a day**, before sleep
- ❑ Study protocol: DBT / Parallel Group Comparison

Apply UVs to skin on 4th week, and check following items;
Moisturizing, Erythema, L-value(brightness), Questionnaires



Moisturizing & Erythema Recovery

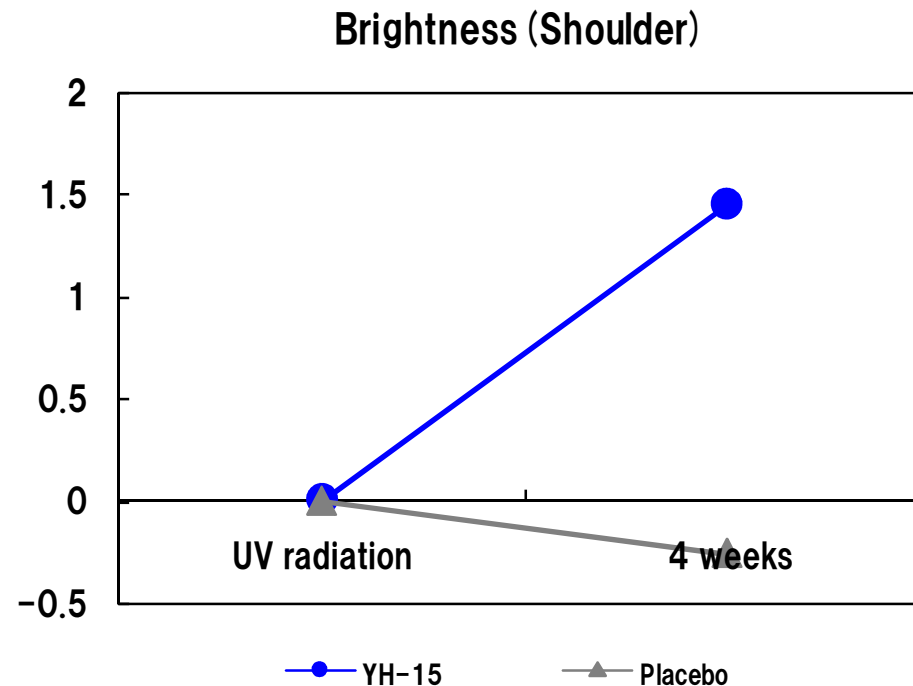
- 4 weeks later after apply UVs (8th week), we checked the moisturizing and recovery rate of erythema (reddish) increases.



*YH-15 = KOHJIN Glutathione

L-Value Changes with Time

- 4 weeks later after apply Uvs (8th week), we checked the L-Values as brightness.

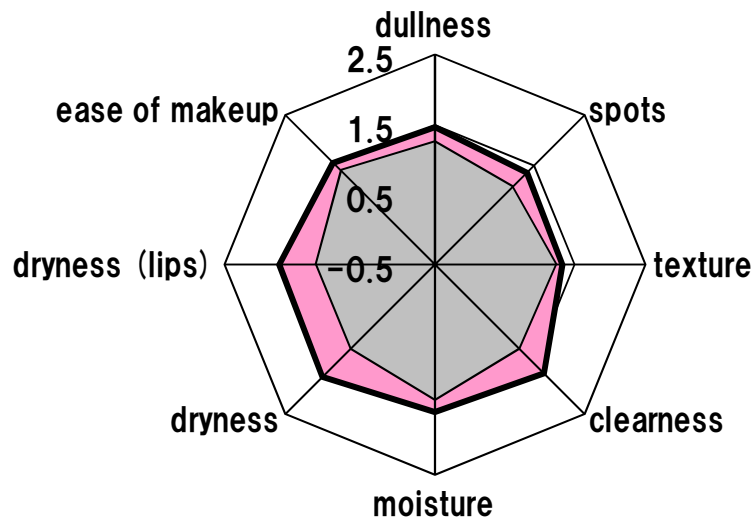


*YH-15 = KOHJIN Glutathione

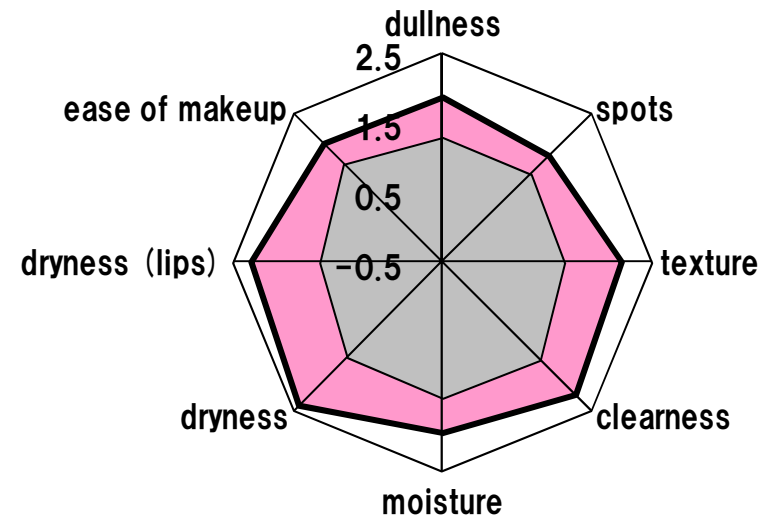
Questionnaire Survey

- Questionnaire survey after 4 weeks and 8 weeks of intake of KOHJIN Glutathione (50mg/day).

Survey after 4 weeks of test period



Survey after 8 weeks of test period

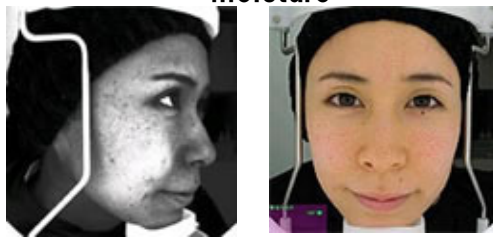


□ YH-15

□ Placebo

*YH-15 = KOHJIN Glutathione

35 women
clinical test
4~8 weeks



Konishi T, Food processing and ingredients, Vol.47, No.8 (2012)

Clinical Study on Skin Beauty (2)

Journal of Dermatological Treatment. 2010; Early Online, 1-6

informa
healthcare

ORIGINAL ARTICLE

Glutathione as an oral whitening agent: A randomized, double-blind, placebo-controlled study



Figure 1. Clinical photography comparing baseline (left) with 4 weeks of glutathione treatment (right).

NUTTHAVUTH ARJINPATHANA & PRAVIT ASAWANONDA

Division of Dermatology, Department of Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

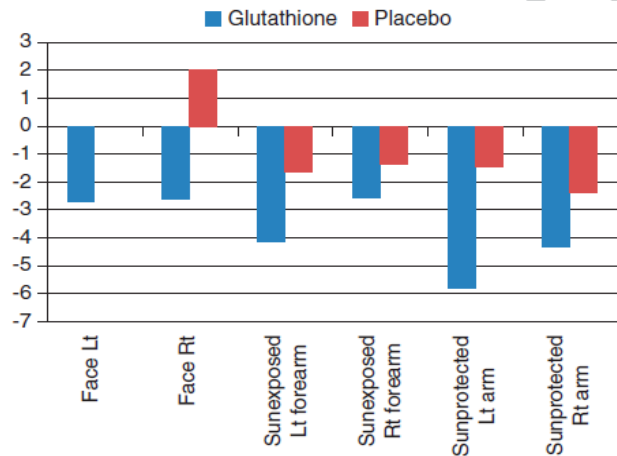


Figure 1. Changes in melanin indices (negative numbers denote decrease in melanin indices).



Excerpta Medica

The American Journal of Surgery 189 (2005) 627-631
Scientific paper

Combination glutathione and anthocyanins as an alternative for skin care during external-beam radiation

T. Miko Enomoto, M.D.^a, Thomas Johnson, M.D.^b, Noel Peterson, N.D.^c,
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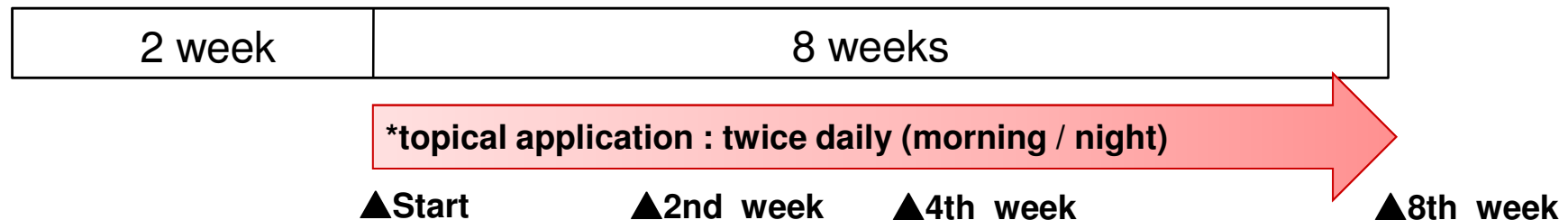
The American
Journal of Surgery

Clinical Study on Skin Beauty (3)

- ❑ Clinical study for “**topical use**” has been just completed in Indonesia.
- ❑ Term: 8 weeks
- ❑ Subjects: 72 women, age 18 to 40
- ❑ Application:
 - Facial wash, Day cream, and Night cream
 - Glutathione 0.1%, 0.5%, or Placebo
- ❑ Protocol: Randomized, Double Blind Test



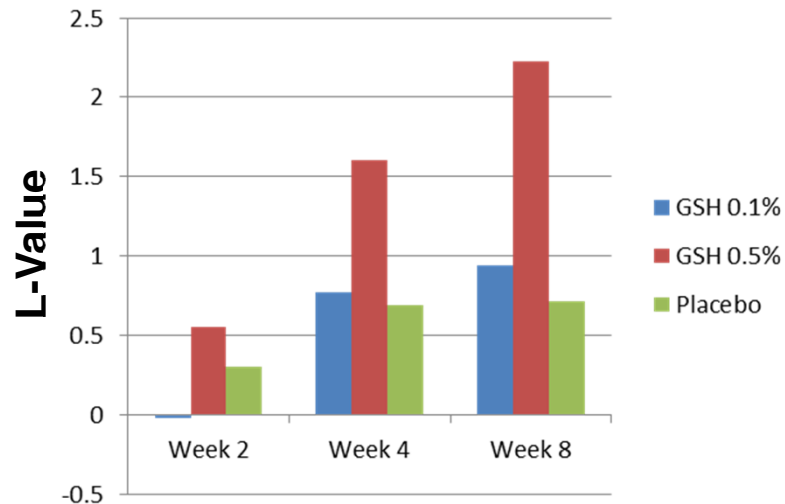
Universitas Gadjah Mada



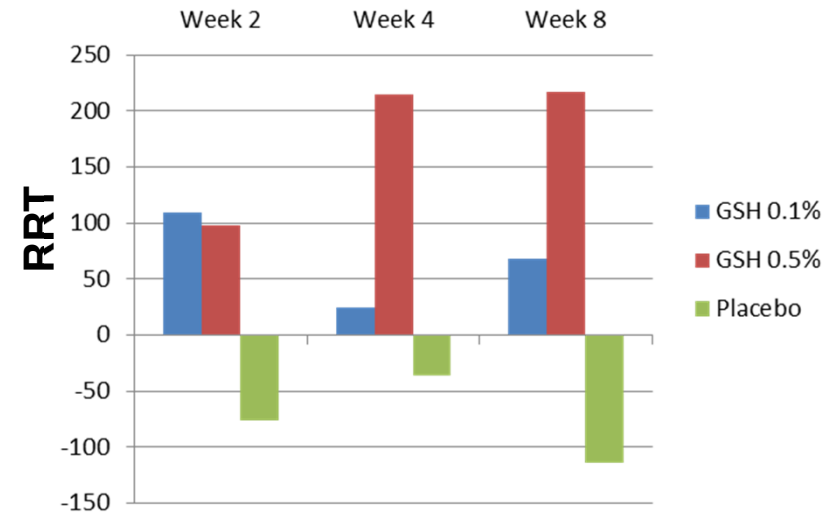
Measured L-Value, Melanin Index, RRT, and etc.

Preliminary Result

Skin brightness for hyperpigmentation



Elasticity



- ❑ Positive result of reducing skin pigmentation and improving elasticity
- ❑ Good for anti-aging?
- ❑ Paper will be prepared soon...

Thank you!!!



Manufactured by ;

 **KOHJIN** Life Sciences Co., Ltd.

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