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# AlphaWave Theanine

November 2022



# ALPHA WAVE<sup>®</sup>

THE CALMING WAVE



# L-Theanine Global Growth

- Marketwatch report 16 may 2022
- CAGR of 7.7% during 2021-2026
- USD 54 Million 2020, to
- USD 84 Million 2026





# L-Theanine

- A non-essential amino acid
- A cup of tea contains around 50mg, which counters the stimulating effect of caffeine
- 200mg per day clinically trialed AlphaWave®





# Categories – Top 3 out of 4 trending





# Brain waves

- Gamma – Motor functions, higher mental state
- Beta – strongly engaged mind 15-40 cycles per second
- Alpha – non-arousal, 9-14 cycles per second. Rest, reflect, meditative. Maximal over the occipital region. Relaxed mental state.
- Theta – slower, 5-8 cycles per second. How did I get this far on the freeway?
- Delta – 1.5-4 cycles per second. Deep, dreamless sleep





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# Trial

- Published in Neurology and Health, September 2021
- Randomised triple blind placebo controlled cross over study
- Frontal alpha power and salivary cortisol levels in healthy, moderately stressed adults
- 16 subjects 16-60 during the global SARS-CoV-2 pandemic
- Significantly increased frontal region alpha power
- Significantly reduced salivary cortisol levels





# 1<sup>st</sup> Trial

- Wellington Sleep Investigation Centre
- Double blind placebo controlled study
- Changes in Alpha brain waves, responses to stress tests, changes in heart rate
- 20 subjects aged 21-47
- Consumption of 200mg of AlphaWave L-Theanine produced significant changes over time as compared to placebo on all the variable outcomes assessed in this investigation. For example, AlphaWave L-Theanine showed a positive effect over time on the tonic alpha power, that measures relaxed wakefulness, whereas the placebo had negative effects. Although the values for anxiety/tension were low, they decreased over time for both groups, and the decrease in AlphaWave group was greater. The group consuming AlphaWave® also displayed reduced fatigue.
- In addition, AlphaWave L-Theanine significantly reduced the heart rate compared with placebo over the time period of the study. This was a further indication of the actual stress reduction effect of AlphaWave L-Theanine.





# TGA listed medicines

- Available for use as an active in Export only medicines
- Available for use as an equivalent ingredient in: Export Only, Over the Counter, Prescription Medicines





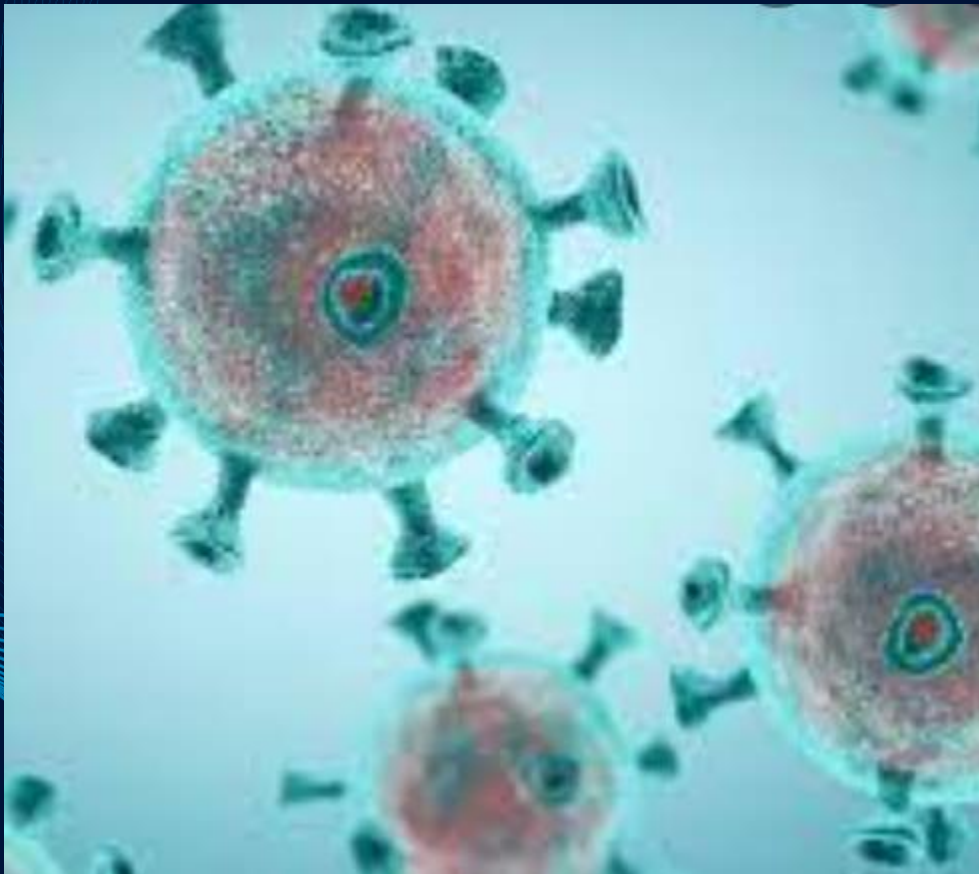
*Study the past if you  
want to define the  
future*



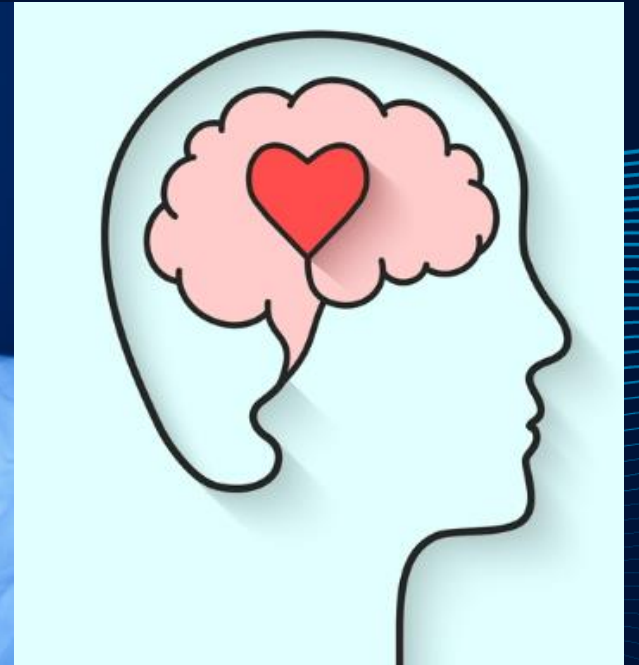
# *The last three years...*

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*We need to move to a wellness, not a symptomatic model  
Trending data*



# Who did black garlic first??

Discovered in a medieval shipwreck (the 15<sup>th</sup> Century Copper Wreck) in the Southern Baltic Sea near Gdansk

Korea has claimed it with multiple processing patents

China has multiple patents

DOI: <https://doi.org/10.2991/efood.k.200617.001>; eISSN 2666-3066

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# When did it arrive on our shores?

Gold rush?

50-60's European migration?



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# *Alliumphobia*

**An irrational or disproportionate fear of garlic**



# Google....

Scholar results 159,000:

2022: 2,360 so far

2021: 13,900

2020: 11,900

2019: 10,700

2018: 9,990

2017: 9,540

2016: 9,210

2015: 9,060



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# Garlic

- Inhibit bacteria and fungi
- Kills MRSA
- Anticholesterolemic
- Lowers BP
- Selective apoptosis
- Antimicrobial action
- Active against gram+ and gram- bacteria

Allicin: Chemistry and Biological Properties

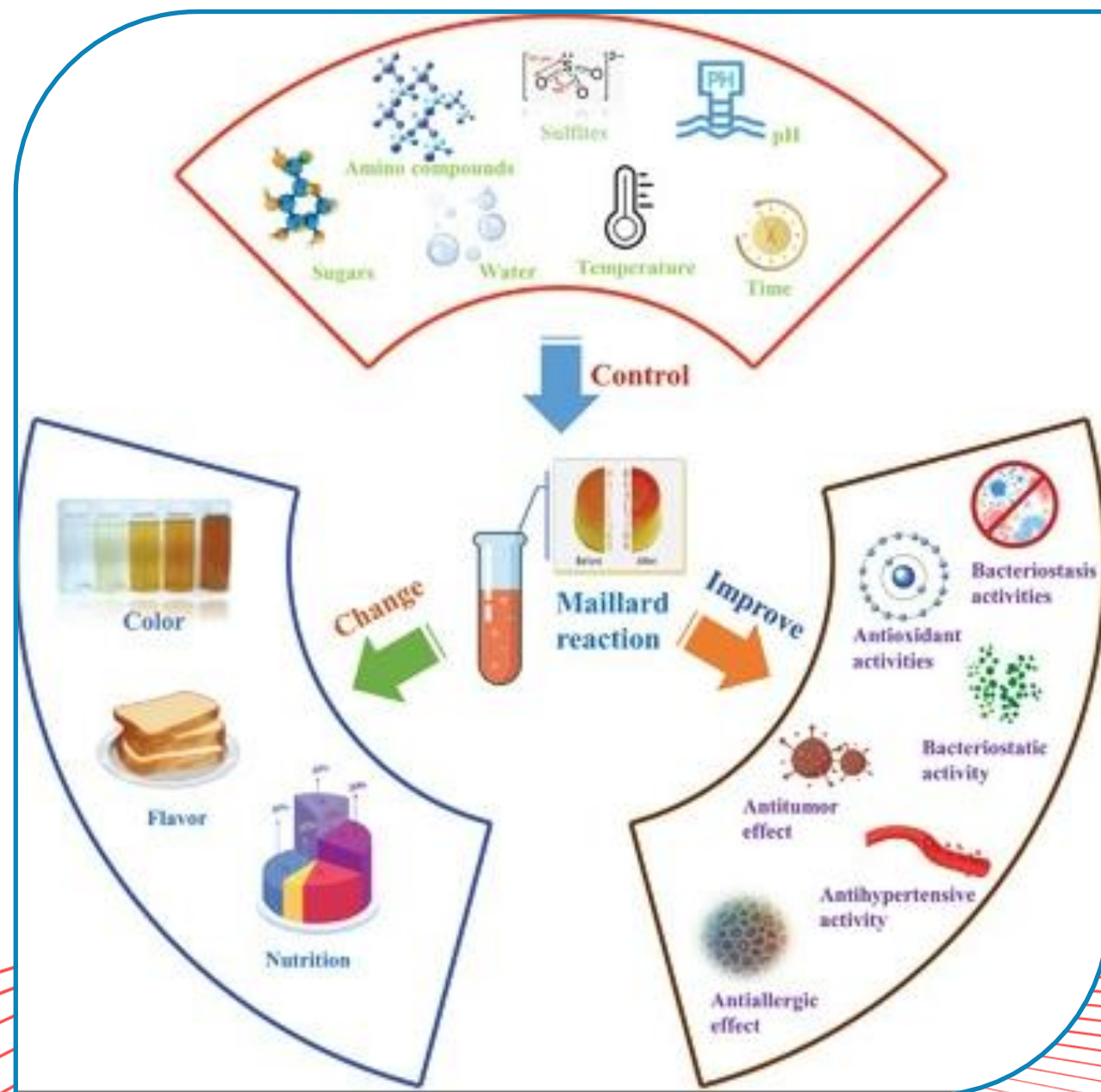
1944 Cavallito and Bailey isolated and described the properties of Allicin

1948 structure determined by Stoll and Seebeck



# Maillard reaction named 1912

This is a non-enzymatic reaction between sugars and proteins (amino acids) that occurs upon heating and that produces browning of some foods (such as meat and bread)





# Maillard reaction applied to garlic (year unknown)

Controlled fermentation process at high humidity and temperature for a set period of time

This reaction alters various components

Decreases the sulfur taste, increases S-allyl cysteine

Results in a sweeter taste





# Comparisons of white and black garlic

- White garlic higher:
  - moisture content
- Black garlic higher
  - sugars and energetic value
  - antioxidant value
  - antimicrobial value particularly against *Staphylococcus aureus*
- Both contain malic, pyruvic, fumaric, oxalic and citric acid





# Action comparisons of White and Black garlic

- Black garlic higher
  - Antibacterial against methicillin-resistant *Staphylococcus aureus* (MRSA) and methicillin-susceptible *Staphylococcus aureus* (MSSA) , *Enterococcus faecalis* and *Listeria monocytogenes* Gram-positive bacteria
  - Antibacterial against *Escherichia coli* and *Pseudomonas aeruginosa* Gram-negative bacteria
- Best minimal bactericidal concentration value was obtained for MRSA and *E. coli*, followed by MSSA, *P. aeruginosa*, and *Acinetobacter baumannii*
- The 3 white garlic samples showed similar antibacterial activity, though did not show bactericidal action





# Processing methods

- Temperature range 40°- 90° degrees
- RH 60-90%
- Incubated for 10-90 days
- Some are fermented with alcohol, and some are fermented with probiotics



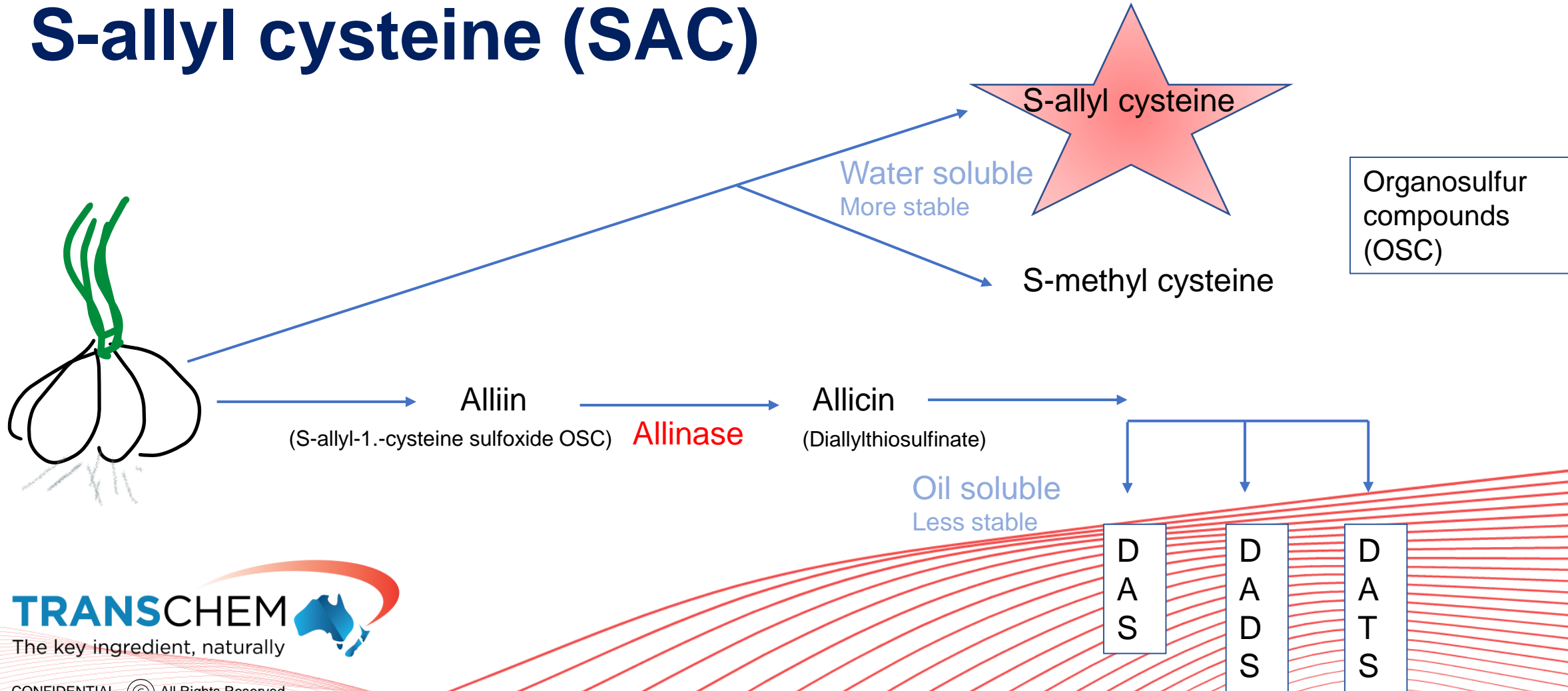
DOI: <https://doi.org/10.2991/efood.k.200617.001>; eISSN 2666-3066

White Garlic	Processed to	Black Garlic
Carbohydrates	↑	1-2 fold
Sucrose	↑	1.3-1.6 fold
Fructose	↑	6 fold
Fructans	↓	6 fold (@ 55° RH80 for 90 days)
Amino acids	↑	2.5 times (@ 60° RH90 for 45 days)
Polyphenols	↑	2.8%
Antioxidant activity (TROLOX) equivalent/kg	↑	6-7% (@ 60° RH90 for 45 days)
Phenol-like compounds	↑	3-4 fold
Flavonoid-like compounds	↑	1.5-8 fold
Antioxidants	↑	1.6-12 fold
Generally:		
Polyphenols	↑	6 times higher in the peeled clove
Allicin	↓	To trace levels and more bioavailable?
<b>S-allyl-L-cysteine</b>	↑	<b>4-8 up to 10 fold in black garlic</b>



**S-Allyl cysteine in garlic (*Allium sativum*): Formation, biofunction, and resistance to food processing for value-added product development**Bara Yudhistira<sup>1,2</sup> | Fuangfah Punthi<sup>1</sup> | Jer-An Lin<sup>3</sup> |  
Andi Syahrullah Sulaimana<sup>4</sup> | Chao-Kai Chang<sup>1</sup> | Chang-Wei Hsieh<sup>1,5</sup>

# S-allyl cysteine (SAC)



# SAC – purported to be the most abundant bioactive in Black Garlic

Healthy humans (n=120)

**2.5g/day for 45 days:** ↑ T-cells in the epithelial linings of intestines, lung and urinary tract doubled their ability to proliferate

NK Cells almost tripled their ability to proliferate compared to controls

**2.4g/day for 12 months:**

Regressed coronary artery plaque (LAP) volume by 29% in AGE group compared to 57% progression in placebo group (type 2 DM)





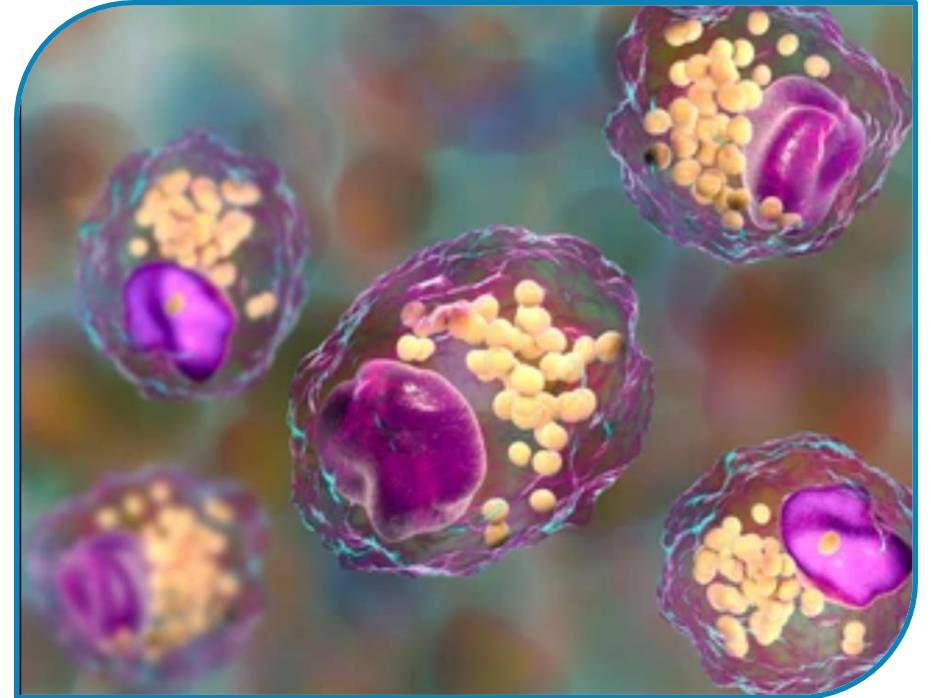
# The immune system produces free radicals when it is activated

Macrophages engulf a virus during the innate immune response

Collateral damage from free radicals is lessened with antioxidants

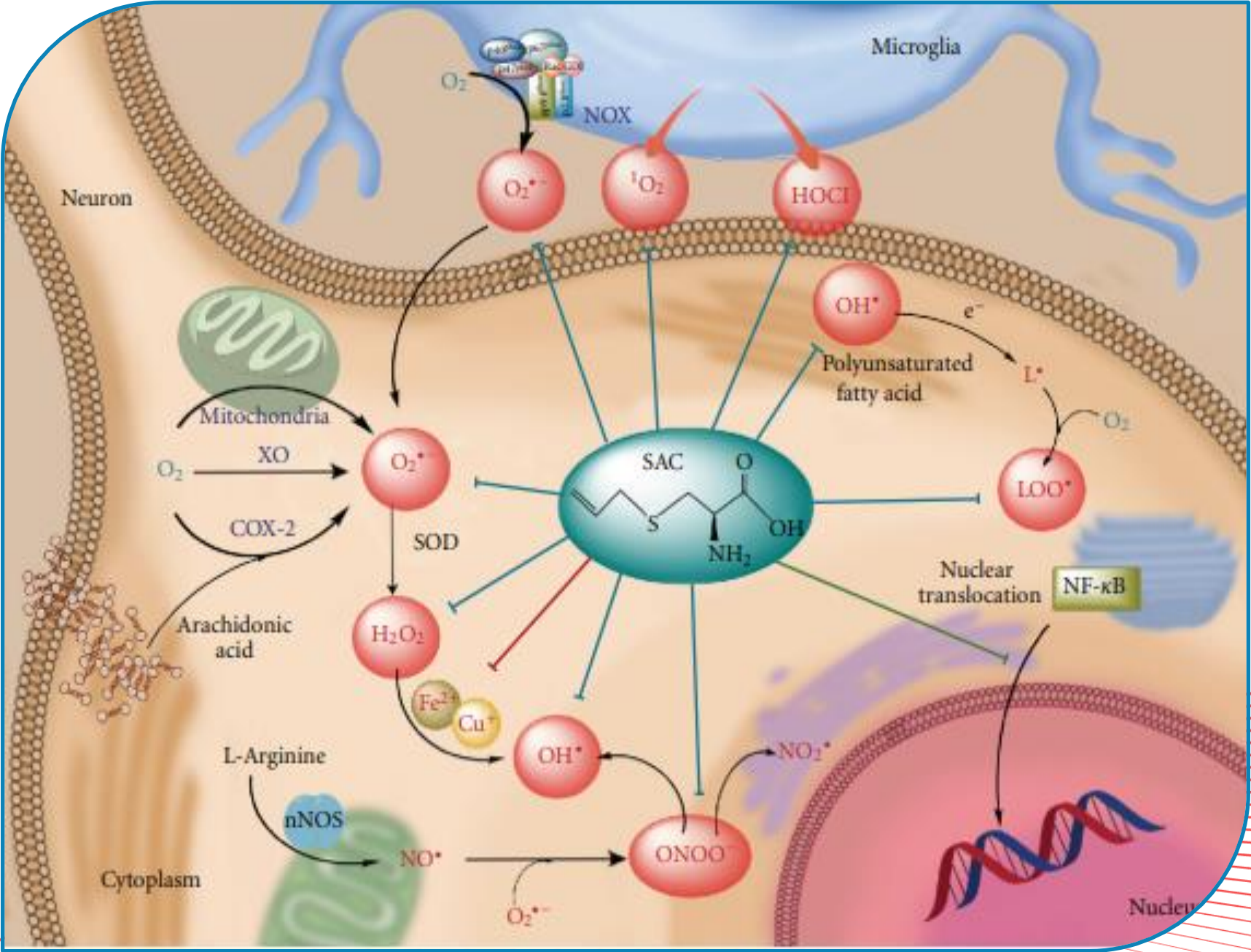
Inner immune response protective enzymes include GSH, SOD, GPx

It's important to support the body processes



Review Article  
**The Antioxidant Mechanisms Underlying  
the Aged Garlic Extract- and  
S-Allylcysteine-Induced Protection**

Ana L. Colín-González,<sup>1</sup> Ricardo A. Santana,<sup>1</sup> Carlos A. Silva-Islas,<sup>1</sup>  
Maria E. Cháñez-Cárdenas,<sup>1</sup> Abel Santamaría,<sup>2</sup> and Perla D. Maldonado<sup>1</sup>





# SAC can be used instead of NAC – relevance?



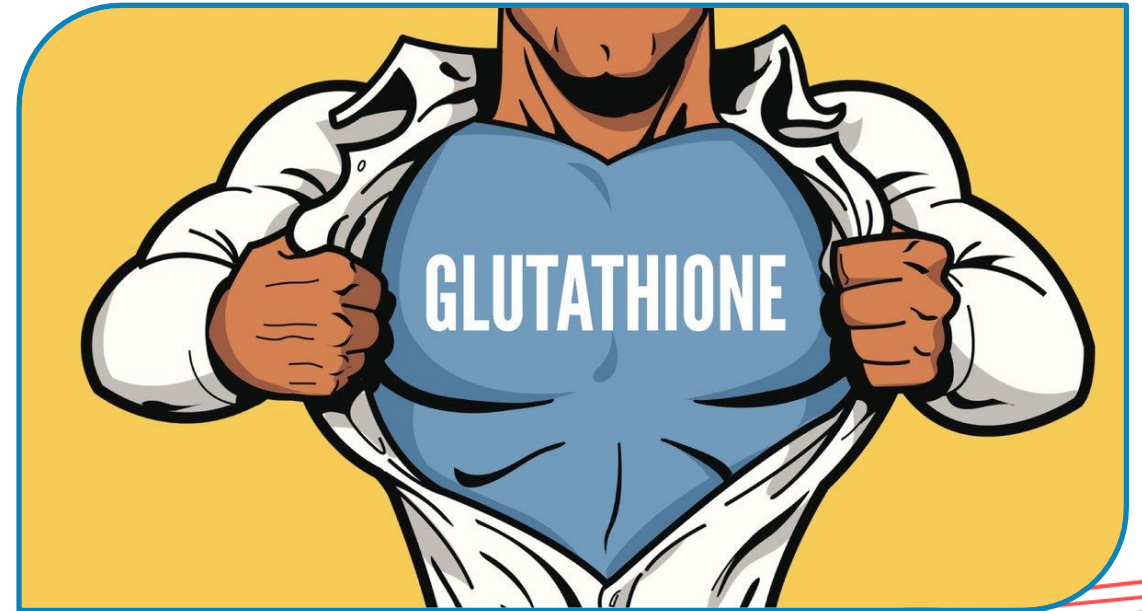
# The importance of Glutathione support

Required for glutathione:

Cysteine

Lysine

Glutamic acid





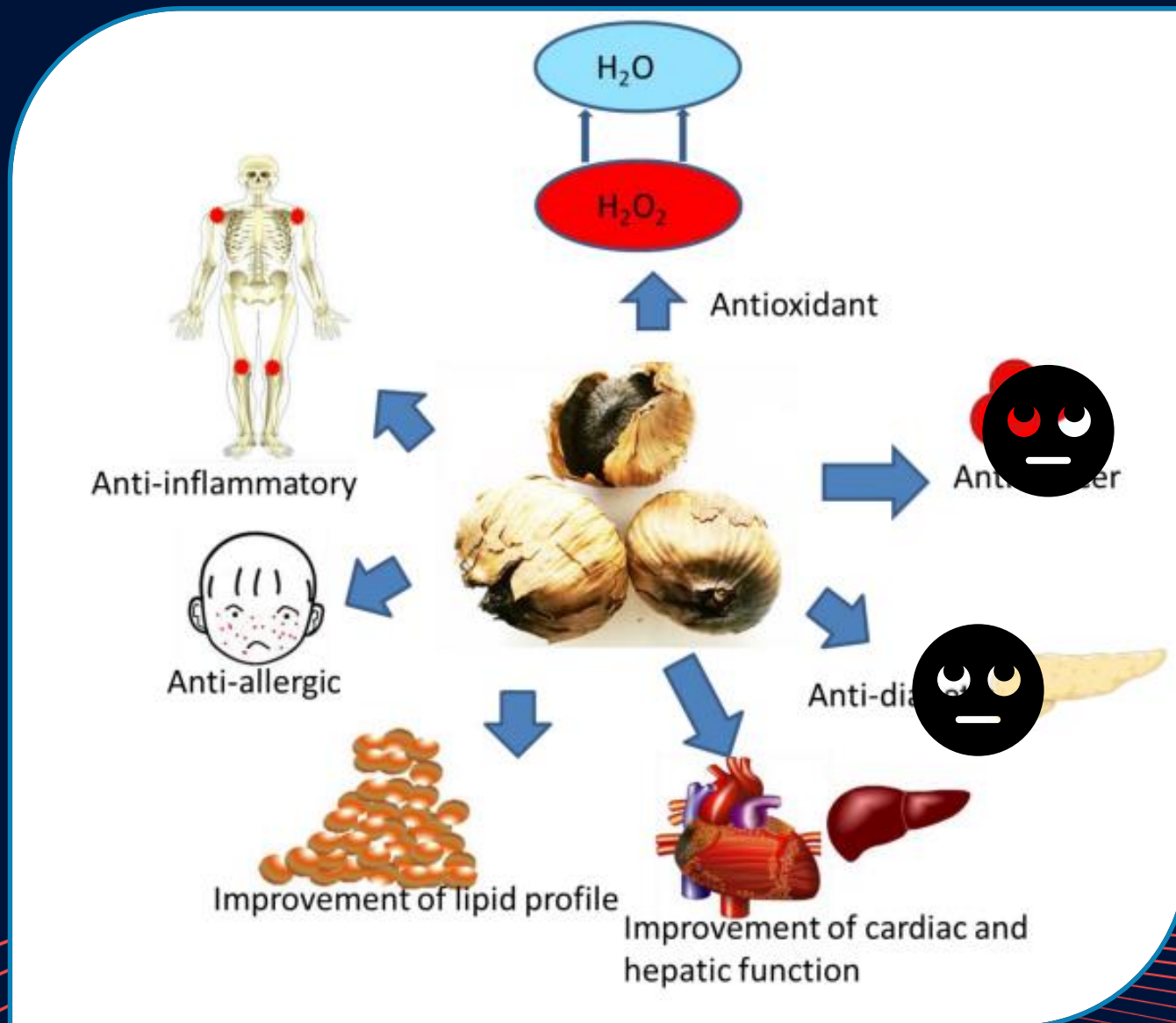
# Studied uses of black garlic

Front. Physiol., 01 November 2018  
| <https://doi.org/10.3389/fphys.2018.01435>

**Black Garlic Improves Heart Function in Patients With Coronary Heart Disease by Improving Circulating Antioxidant Levels**

Jingbo Liu, Guangwei Zhang, Xiaoqiang Cong and Chengfei Wen\*

•Department of Cardiovascular, The First Hospital of Jilin University, Changchun, China





Market in increasing due to its multi-function benefit for human health<sup>(5)</sup>

Estimated market value is USD94 million and increasing rapidly

Black garlic produced in Australia

## Australian black garlic producers targeting '\$100 million' Asian export market

Landline / by Luke Wong

Posted Sat 26 Mar 2022 at 1:20pm



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Traceability from soil to shelf

Supporting Australian growers – all Australian grown bulbs

Security of supply

4:1 extract

No carrier



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## Benefits

Immune support

Glutathione

Global changes with NAC

Free radicals from macrophages during immune response

Reducing inflammation & inflammatory cytokines

Cardiovascular health







## Applications

Immunity plus

Detoxification pathway products – support the body's own systems and its innate wisdom

Standard garlic product claims,

Including cardiovascular health, immune support, antioxidant,



# Uses – speak to us!

- Antioxidant/Reduce free radicals formed in the body
- Helps reduce/decrease free radical damage to body cells  
Aids/assists with recovery from illness/convalescence Helps enhance/promote healthy blood circulation Maintain/support healthy blood circulation Helps in the maintenance of healthy blood lipids/blood fats Helps maintain/support healthy cholesterol Helps maintain/support healthy blood sugar/glucose Maintain/support cardiovascular system health Traditionally used in Western herbal medicine to maintain/support cardiovascular system health Maintain/support healthy cardiovascular system function Helps maintain/support vasodilator/ blood vessel dilation Helps enhance/promote artery health Maintain/support artery health Maintain/support blood capillary health Maintain/support blood vessel health Helps enhance/promote blood vessel health Traditionally used in Western herbal medicine to decrease/reduce/relieve flatulence/carminative Decrease/reduce/relieve flatulence/carminative Maintain/support immune system health Enhance/improve/promote immune defence/immunity Helps enhance/improve/promote immune system function Maintain/support healthy immune system function



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# Security of supply

- Australian grown – not imported
- Supporting Australian families
- No supply chain issues
- Traceability from the soil to the shelf



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# Innovative Portfolio





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**Thank you**