

TRANSCHEM

The key ingredient, naturally



AlphaWave Theanine

November 2022



ALPHAWAVE®
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



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



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



1st 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

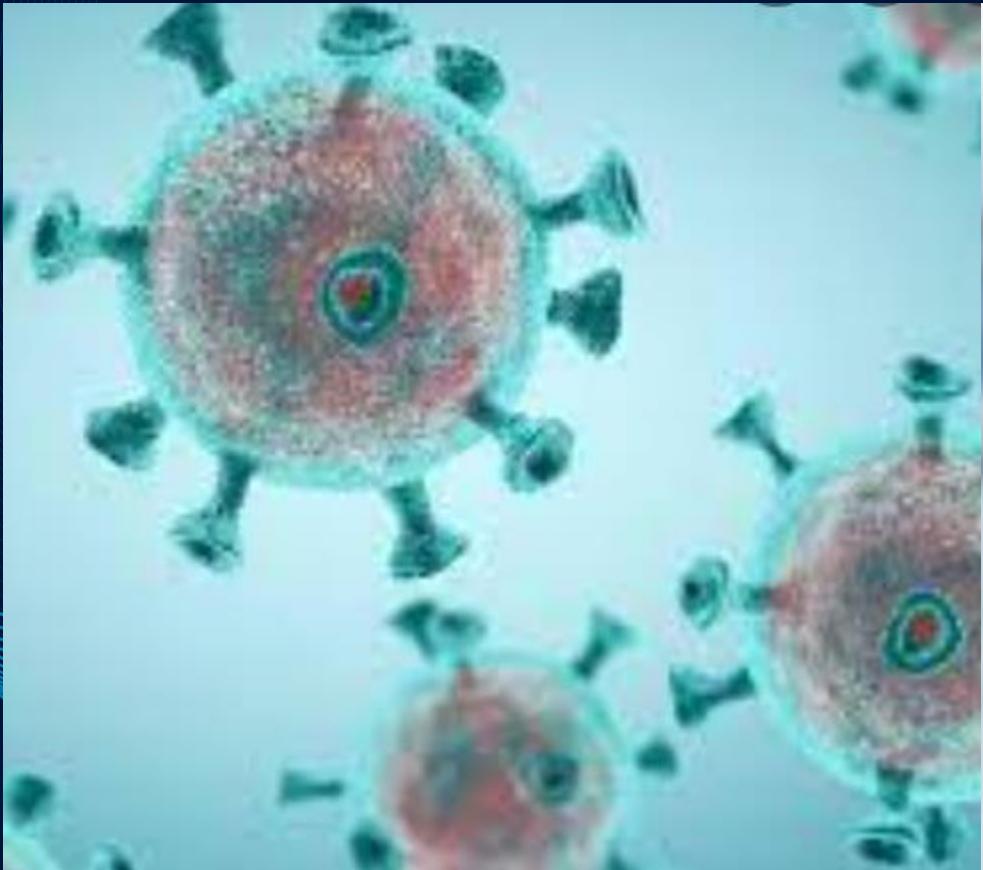




*Study the past if you
want to define the
future*

Confucius

The last three years...





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

Who did black garlic first??

Discovered in a medieval shipwreck (the 15th 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

CHEM

The key ingredient, naturally

CONFIDENTIAL  All Rights Reserved

When did it arrive on our shores?

Gold rush?

50-60's European migration?



CHEM

The key ingredient, naturally

CONFIDENTIAL  All Rights Reserved





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



Garlic

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

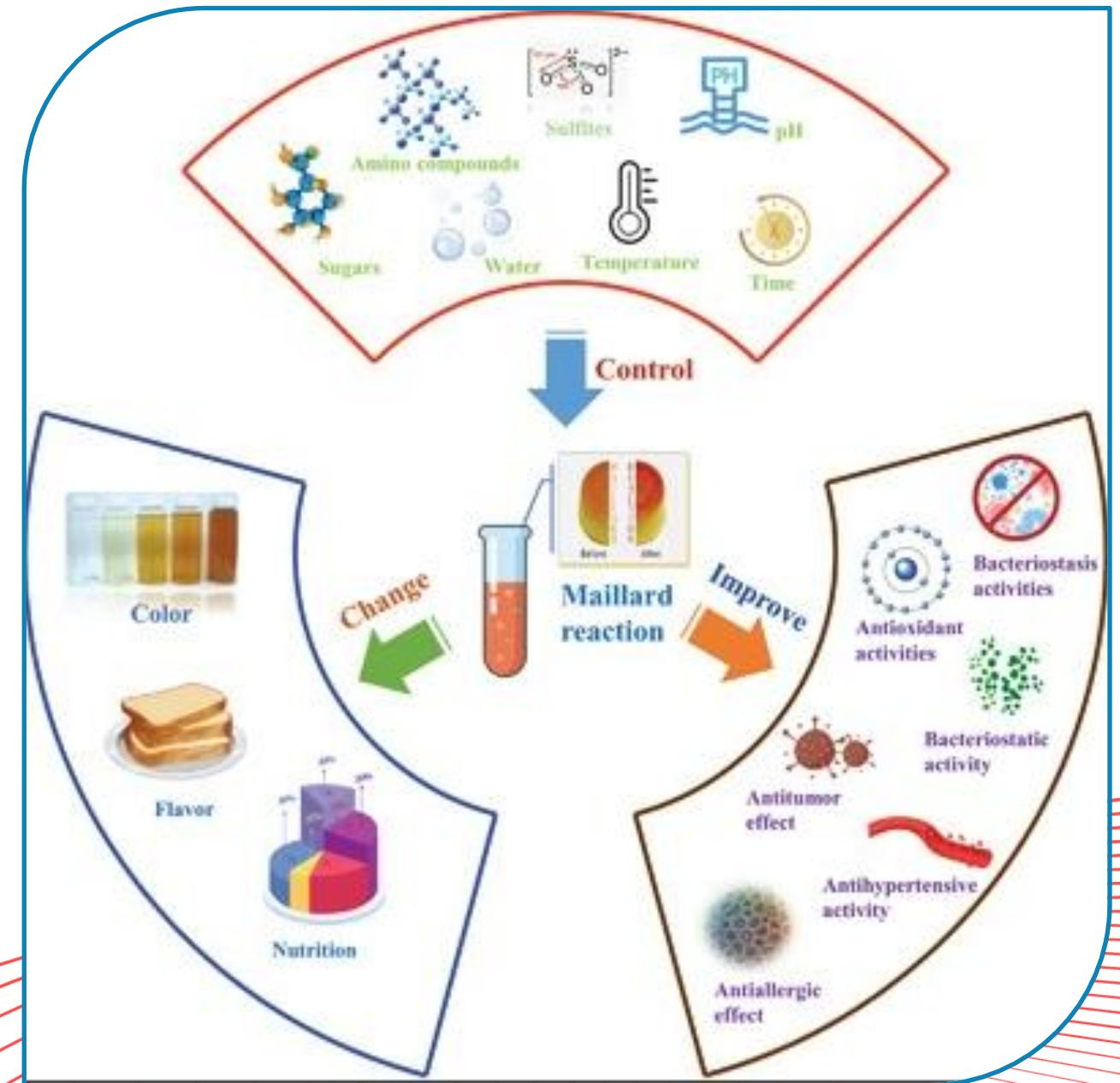
Allicin: Chemistry and Biological Properties

1944 Cavallito and Bailey isolated and described the properties of Allicin

1948 structure determined by Stoll and Seebek

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

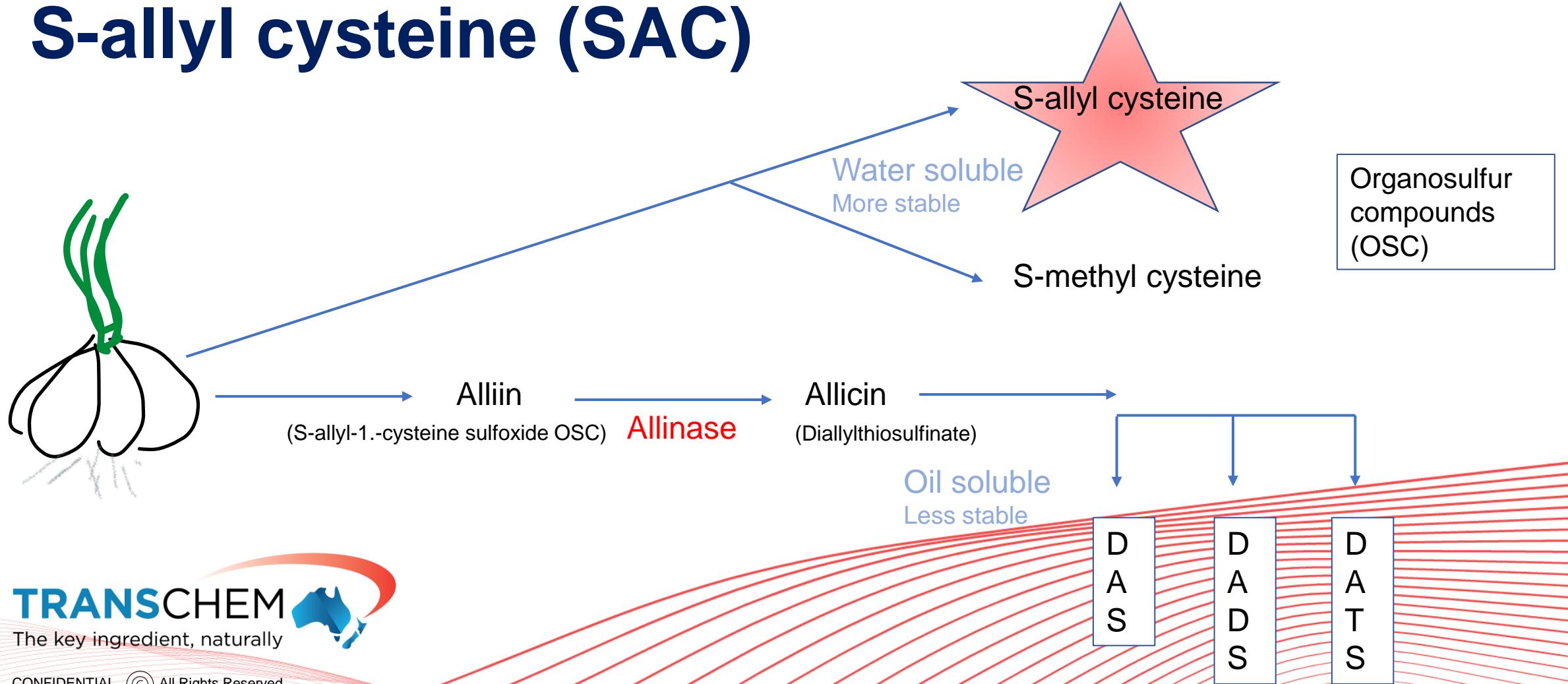


White Garlic	Processed to	Black Garlic
Carbohydrates	↑	1-2 fold
Sucrose	↑	1.3-1.6 fold
Fructose	↑	6 fold
Fructans	↓	6 fold (@ 55° RH80 for 90 days)
Amino acids	↑	2.5 times (@ 60° RH90 for 45 days)
Polyphenols	↑	2.8%
Antioxidant activity (TROLOX) equivalent/kg	↑	6-7% (@ 60° RH90 for 45 days)
Phenol-like 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?
S-allyl-L-cysteine	↑	4-8 up to 10 fold in black garlic

S-Allyl cysteine in garlic (*Allium sativum*): Formation, biofunction, and resistance to food processing for value-added product development

Bara Yudhistira^{1,2} | Fuangfah Punthi¹ | Jer-An Lin³ |
Andi Syahrullah Sulaimana⁴ | Chao-Kai Chang¹ | Chang-Wei Hsieh^{1,5}

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)



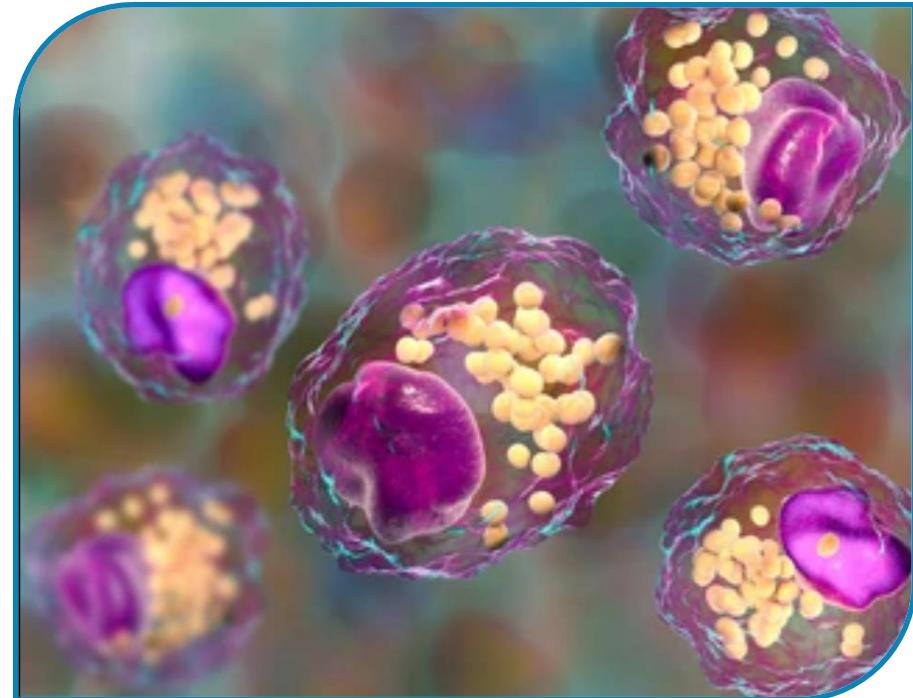
The immune system produces free radicals when it is activated

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

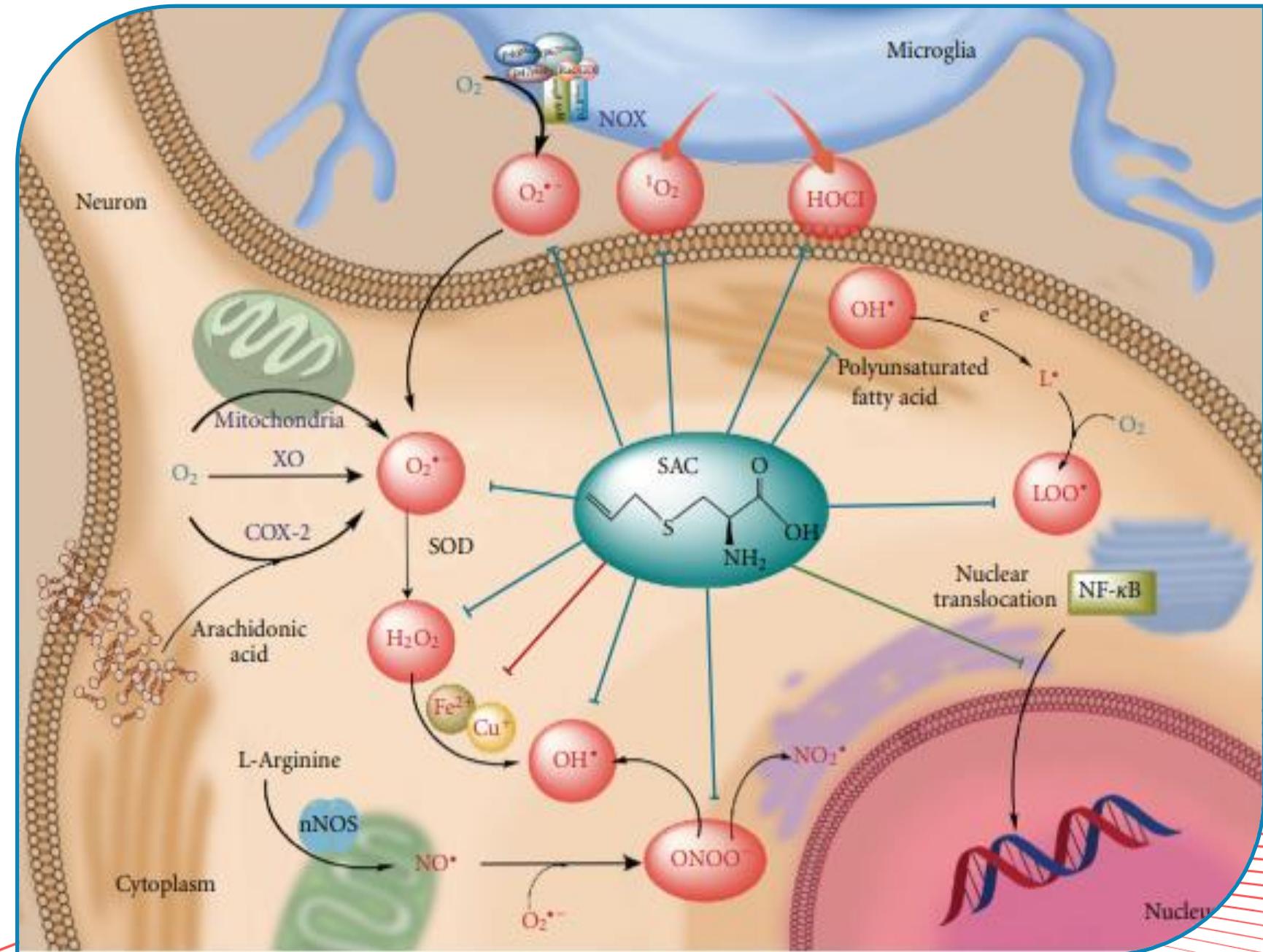
It's important to support the body processes



Review Article

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

Ana L. Colín-González,¹ Ricardo A. Santana,¹ Carlos A. Silva-Islas,¹ María E. Chávez-Cárdenas,¹ Abel Santamaría,² and Perla D. Maldonado



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

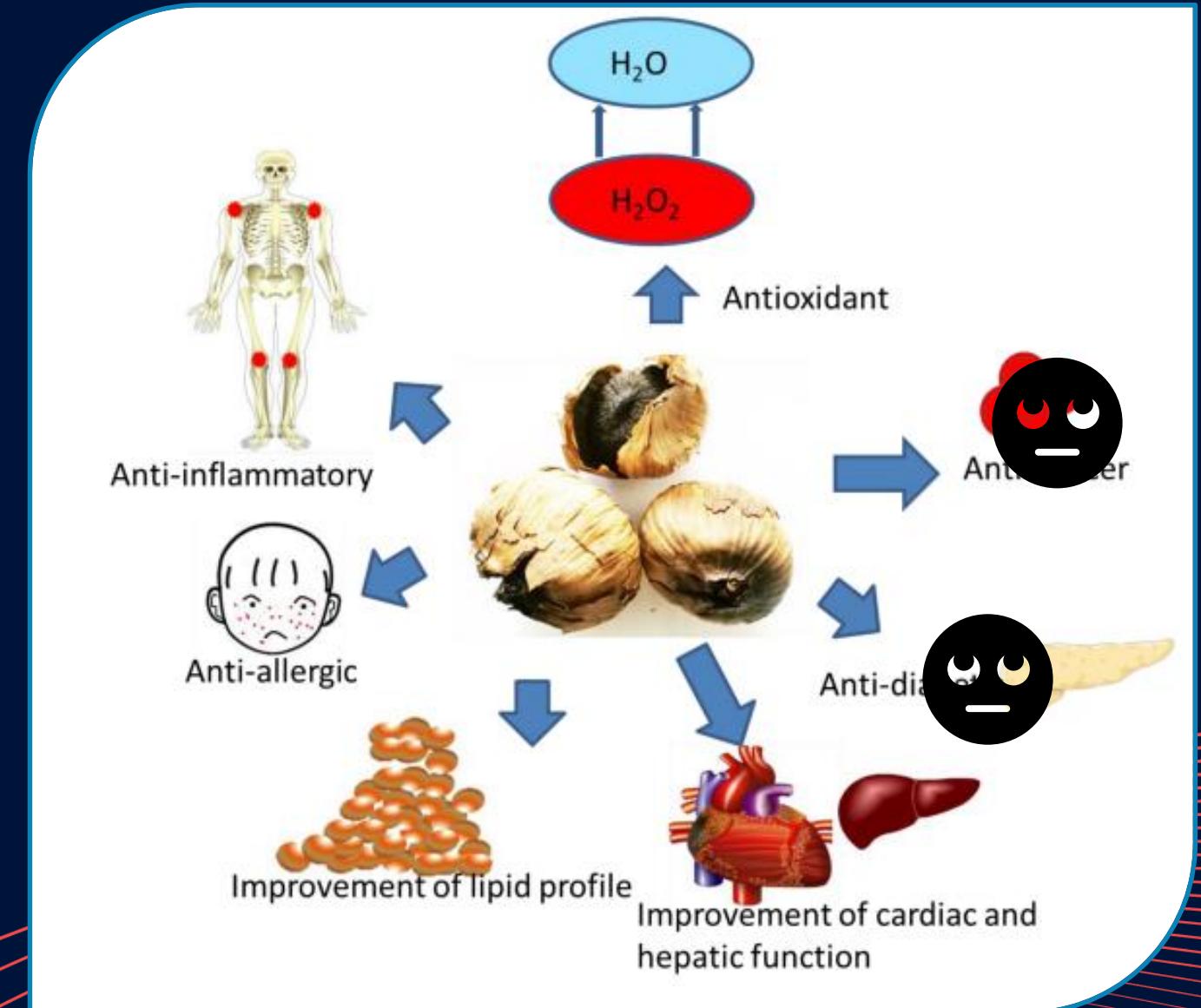
Jingbo Liu, Guangwei Zhang, Xiaoqiang Cong and Chengfei Wen*

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

TRANSCHEM

The key ingredient, naturally

CONFIDENTIAL (C) All Rights Reserved





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

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





Traceability from soil to shelf

Supporting Australian growers – all Australian grown bulbs

Security of supply

4:1 extract

No carrier





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!

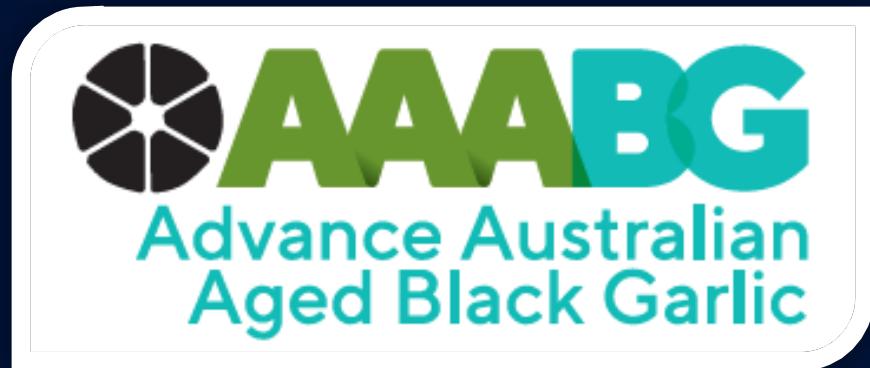
- Antioxidant/Reduce free radicals formed in the body
- Helps reduce/decrease free radical damage to body cells
Aids/assists with recovery from illness/convalescence Helps enhance/promote healthy blood circulation Maintain/support healthy blood circulation Helps in the maintenance of healthy blood lipids/blood 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



The key ingredient, naturally

Security of supply

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



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

Landline / by Luke Wong

Posted Sat 26 Mar 2022 at 1:20pm





Innovative Portfolio



TRANS^{CHEM}

The key ingredient, naturally



Thank you