

Sunscreen Mythbusting

Reflections from the
social media frontline

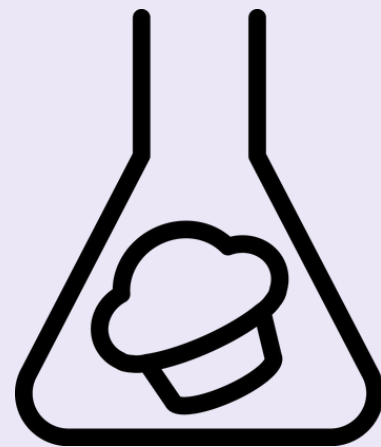
Dr Michelle Wong
Lab Muffin Beauty Science
15 May 2022



About Me

Dr Michelle Wong

B Sc Adv (H1M), PhD (Chem), Dip Form Chem,
Science Education



labmuffin.com

Website, established 2011
2 million visits per year

[@labmuffinbeautyscience](https://www.instagram.com/labmuffinbeautyscience)

Instagram page, established 2014
360,000 followers

[Lab Muffin Beauty Science](https://www.youtube.com/channel/UC...)

YouTube channel, established 2017
324,000 subscribers

Check [@LabMuffin](#) for info about it. She talks a lot about sunscreen.



Easy (5 Minute) DIY Vitamin C Serum | Lab Muffin Beaut...

600K views • 2 years ago

CC



Do You Need to Wear Sunscreen Indoors? An...

379K views • 1 year ago



Good and Bad DIY Hand Sanitizer Recipes | Lab Mu...

366K views • 2 years ago

CC



My Top 6 Holy Grail Sunscreens | Lab Muffin...

364K views • 2 years ago



Best and Worst of The Ordinary (Part 1) | Lab Muffi...

335K views • 1 year ago

CC



5 Skincare Myths Ruining Your Skin | Lab Muffin Beau...

314K views • 6 months ago

CC



Do Collagen Supplements Work for Wrinkles and...

282K views • 4 years ago

CC



The chemistry of micellar water

264K views • 8 months ago



Not Good: The Ordinary's Niacinamide and L-Ascorbi...

262K views • 1 year ago

CC



My Skincare Philosophy, Routine and Products: 2019...

261K views • 1 year ago

CC



How to Reapply Sunscreen Over Makeup | Lab Muffin...

231K views • 1 year ago



Top 7 Sunscreen and SPF Myths | Lab Muffin Beauty...

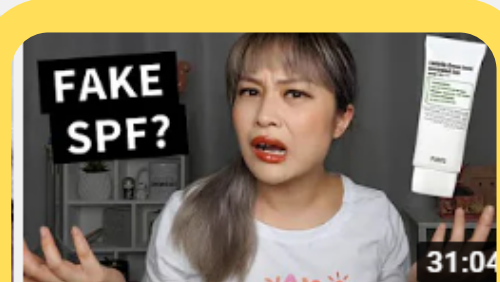
228K views • 3 years ago



Biggest Skincare Myths and What to Do Instead | Lab...

207K views • 3 years ago

CC



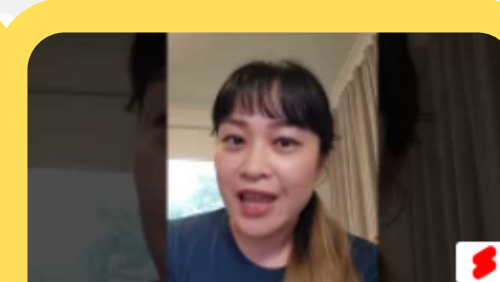
Purito Sunscreen and All About SPF Testing | Lab...

207K views • 1 year ago



How to Use Sunscreen and Make-up Together | Lab...

200K views • 4 years ago



Why are Australian sunscreens so good?

187K views • 3 months ago



Scientist Reacts to Bad Beauty Hacks: 5 Minute...

183K views • 2 years ago

CC



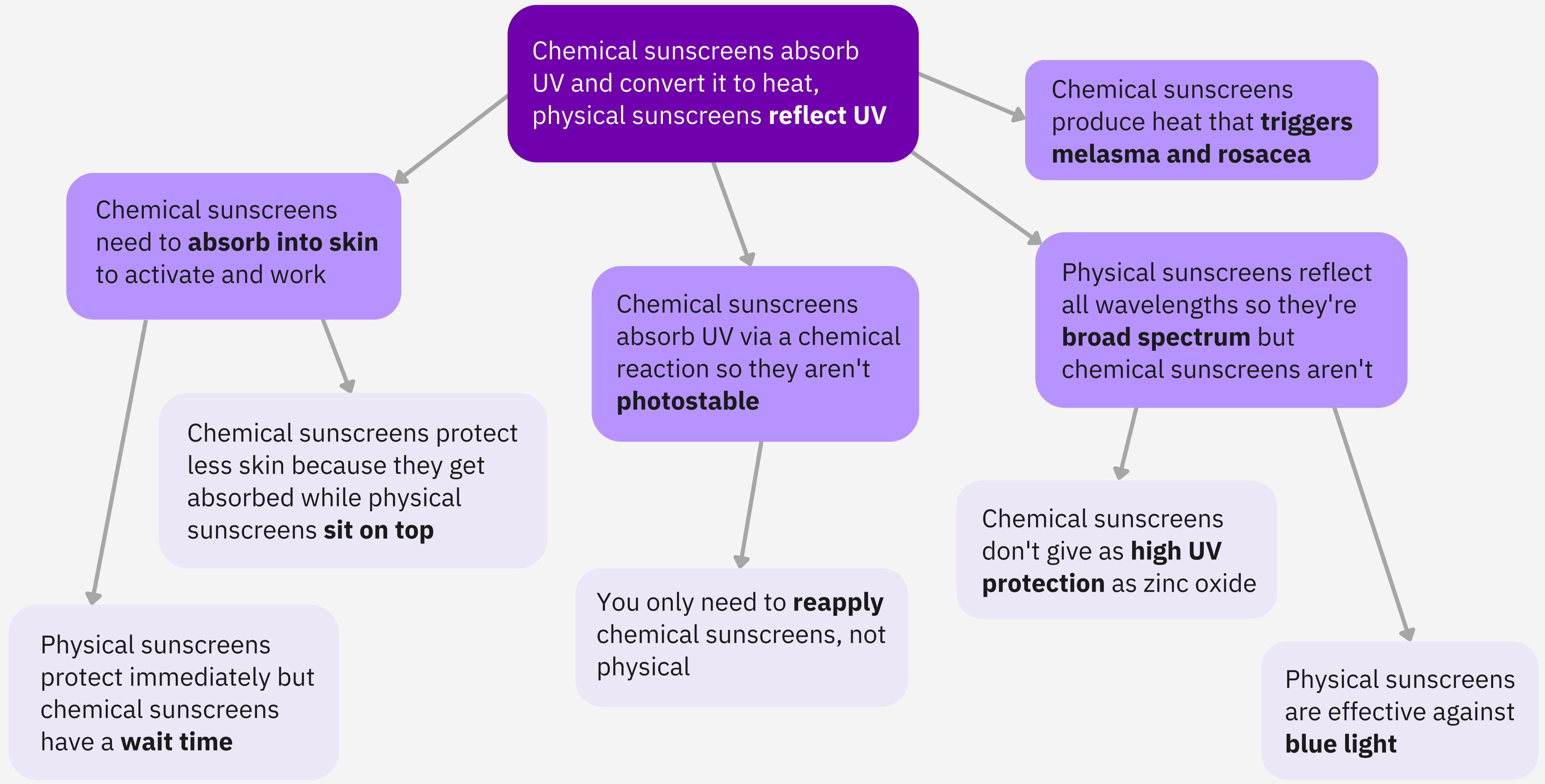
Best Sunscreens 2021 | Lab Muffin Beauty Science

177K views • 10 months ago

Where do sunscreen myths come from?

How can we bust myths effectively?

Why should we care?



Chemical sunscreens absorb UV and convert it to heat, physical sunscreens **reflect UV**

Chemical sunscreens produce heat that **triggers melasma and rosacea**

Chemical sunscreens need to **absorb into skin** to activate and work

Physical sunscreens reflect all wavelengths so they're **broad spectrum** but chemical sunscreens aren't

Chemical sunscreens absorb UV via a chemical reaction so they aren't **photostable**

Chemical sunscreens protect less skin because they get absorbed while physical sunscreens **sit on top**

Chemical sunscreens don't give as **high UV protection** as zinc oxide

Physical sunscreens protect immediately but chemical sunscreens have a **wait time**

You only need to **reapply** chemical sunscreens, not physical

Physical sunscreens are effective against **blue light**

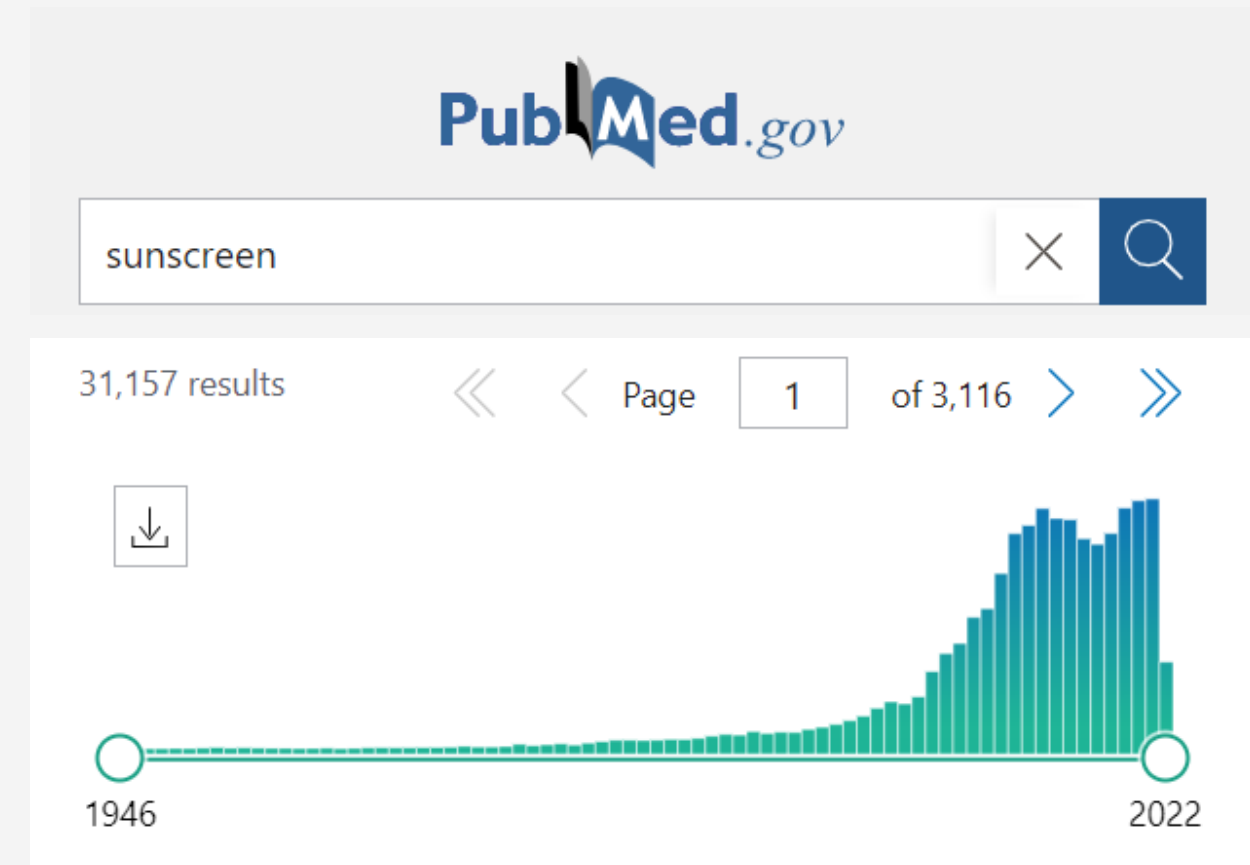
"[In 2017] only 55% of Australian adults recognise that it's safe to use sunscreen every day, down from 61% in 2014."

**Why are there so many
sunscreen myths?**

Lots of studies

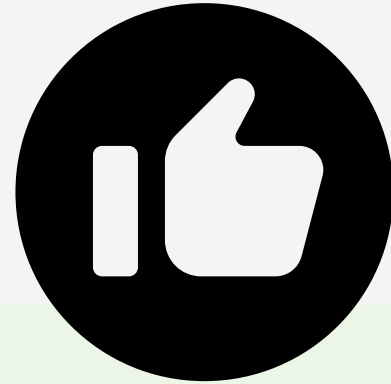
Regulated as a drug in US, AU...

Anti-cancer product = research funding



Uses

Broad spectrum UVA and UVB sunscreen for adults. May assist in preventing some skin cancers. May reduce the risk of some skin cancers. Can aid in the prevention of solar keratoses. Can aid in the prevention of sunspots. Can aid in the prevention of premature skin ageing.



Lots of public data to draw from (compared to other cosmetic products)



Lots of highly technical, incomplete information for misinterpretation

Paywalls mean that often only abstracts (often misleading, purposely vague, necessarily brief) are available

Open access papers are usually lower quality, lots of predatory publishers without real peer-review

Introductions and conclusions "hype up" its research and may not represent its significance accurately, but are also the most readable

Papers are written assuming readers have knowledge of the field and specific terminology

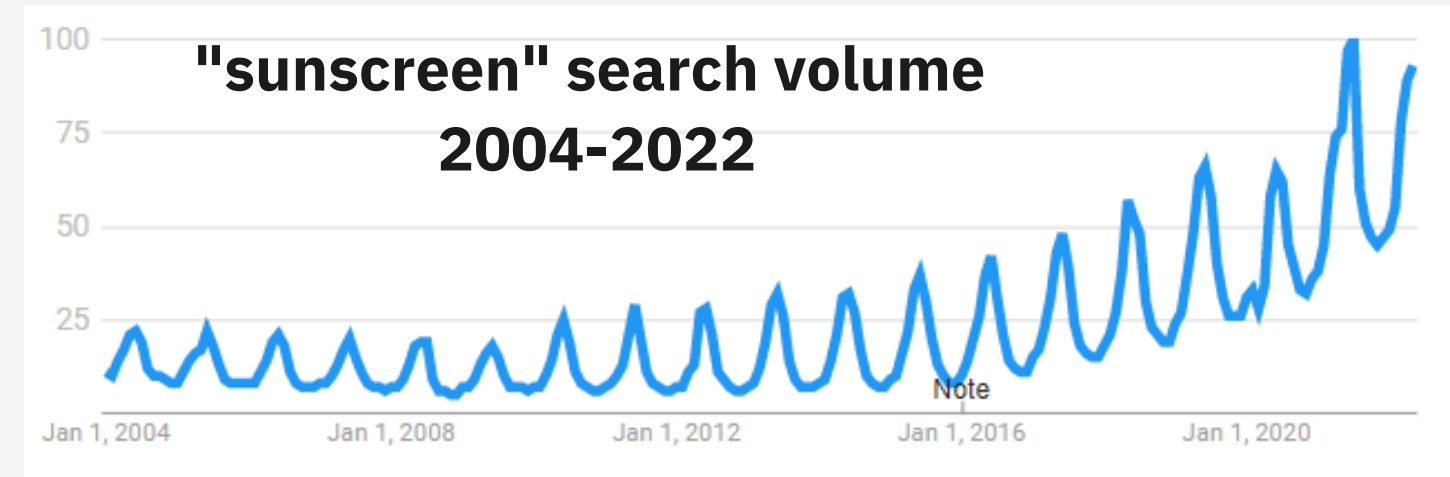
Cosmetic science often isn't published in peer-reviewed journals

Increased interest

Skincare boom and promotion of sunscreen as anti-aging essential by media, experts and influencers

Ease and awareness of grey market imports (especially Korean sunscreens)

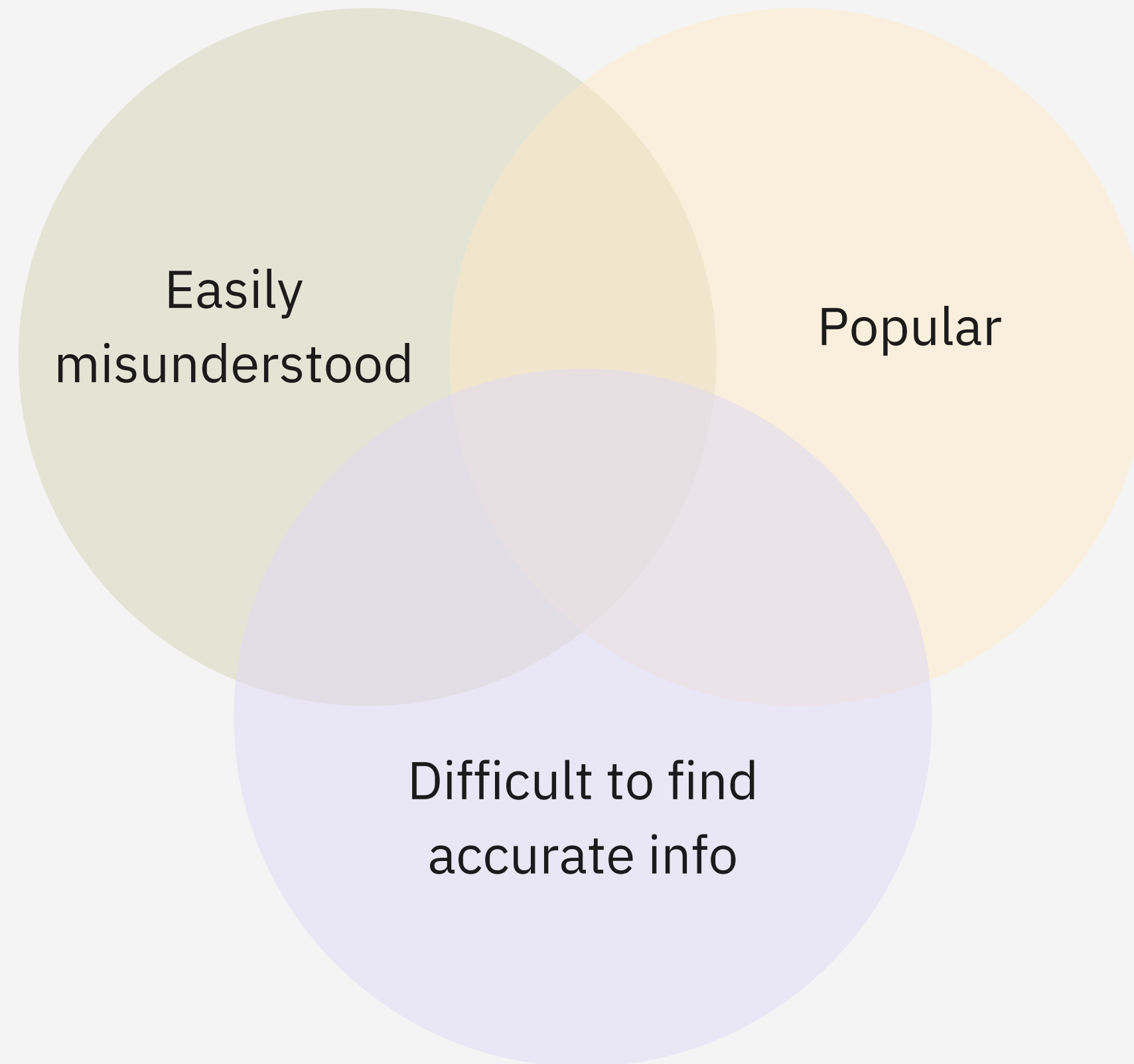
Launch of more cosmetically elegant Western face sunscreens



This Is the Most Important Anti-Aging Product You Can Use

5 IMPORTANT REASONS TO WEAR SUNSCREEN DAILY





Easily
misunderstood

Popular

Difficult to find
accurate info

**How do we bust myths
effectively?**

Direct hit

MYTH

Chemical sunscreens need to react with skin before they can protect from UV.

TRUTH

Chemical sunscreens don't react with skin.



Address myth head on

Make it easy for audience to identify which myth you're talking about

"Backfire effect" isn't an issue if you're clear

Direct hit



Explain why myth is incorrect

Replace myth's logic with better logic

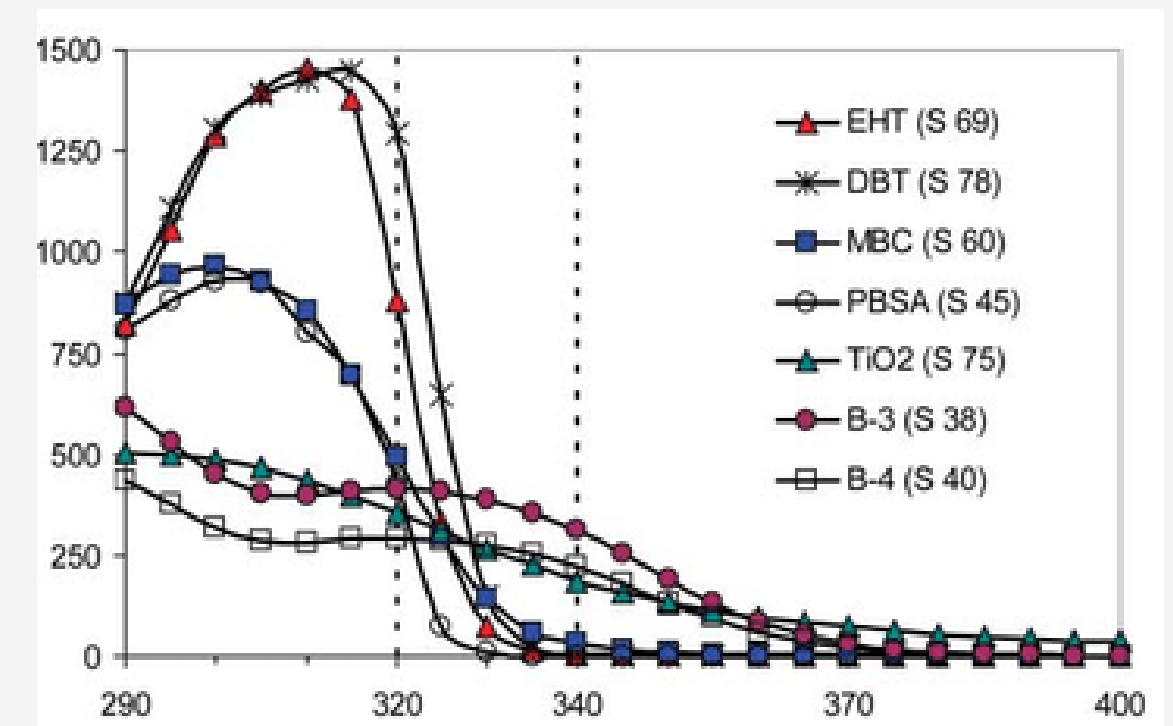
Point out inconsistencies with the myth

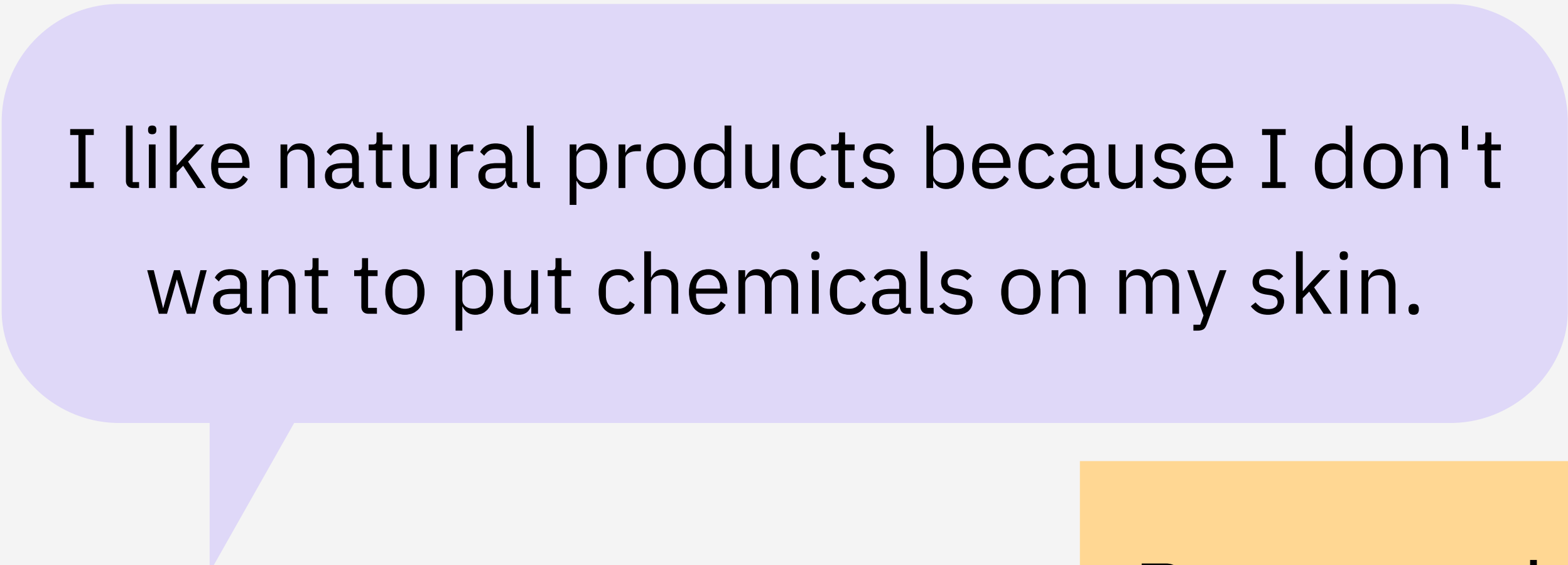
Use multiple reasons if you can

"As little as possible, as much as necessary"

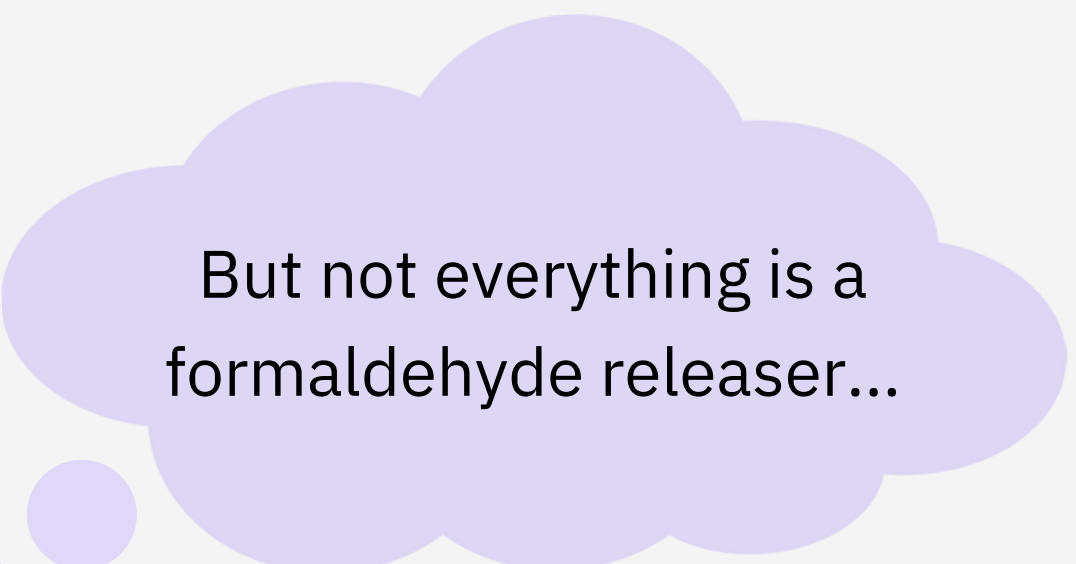
Pre-empt common questions and misconceptions

Convenient explanations that don't address underlying concerns are bad





I like natural products because I don't want to put chemicals on my skin.



But not everything is a formaldehyde releaser...



But everything is chemicals!

EVERYTHING IS CHEMICALS.

Including 'Clean' Beauty.

Chemicals are nothing new. Atoms form bonds, creating molecules that make up matter, that makes up everything around us, long before humans created Chemistry. One can say that nature is the original Chemist, and Chemistry is the language through which humans communicate their findings about the workings of the world around them down to an atomic level.

In the language of Chemistry, a chemical is any substance with a definite composition. We communicate this using the periodic table - Chemistry's very own alphabet - to create chemical formulas. For example, a simple combination of one atom of oxygen (O) and two atoms of hydrogen (H) gives us H₂O, the chemical formula of water. In this context, water is a chemical. When the language of Chemistry is removed, water is still water, with the same molecular structure, playing the same role it always has.

Humans are entirely made of chemicals too, and so is everything around us: from the things we can see to the many that we can't. From the foods we can taste, to the flowers we can smell, to the things we can grab and the gases we cannot. Everything is made of chemicals. So what is it about some things that makes them "unclean" when compared to others? Is it because of their chemical composition that makes them "unclean" when compared to its components? Is it because of substances like acetic acid and sodium bicarbonate? Much like some of us are afraid of the dark, most of us will fear the unknown.

At DECIEM, we believe that by bringing science-backed, repeatable, experimental evidence to the forefront, we are leaving some of this darkness behind. The unknown is replaced with scientific information, so that our fears cannot be used as a form of marketing. And while there is much to be uncovered, we conscientiously avoid cherry-picking information to fit our agenda, choosing instead to trust the many scientists making a monumental effort to uncover a complete body of evidence pertaining to the safety of the products that you know.

When interpreting said evidence during and after the creation of our products, we follow the core principle of toxicology - dose makes the poison. We understand that, while everything around us might pose a life threatening hazard, the circumstances under which we come into contact with this hazard are what truly makes the risk. This risk based approach, coupled with solid regulations across the globe, is what has always allowed us, and virtually all current beauty brands, to ensure your safety. Science has worked very hard to earn your trust and, going forward, we vow to show you exactly how.

We believe that the beauty of science is its inquisitive nature - it never stops questioning. And at DECIEM, we question the safety of our ingredients with the same energy that we apply to investigating their efficacy. In both cases, we turn to our fellow scientists for evidence, never settling for one single source, or buckling under the pressure of inaccurate claims propagated by fear-mongering.

DECIEM was founded on principles of authenticity and transparency, and the unclear definition of "clean beauty" directly contradicts these values by encouraging marketing to lead over very clear science. As we all move towards a more transparent future, it's important that we continue to question the ways in which the beauty industry communicates with us.

As a thank you for trusting our disruptive ways, DECIEM's own Scientific team has been working on an exciting project that will shed some light on the subject of ingredient and product safety, from a scientifically-sound perspective that encompasses both the principles of toxicology and the basis of regulatory requirements. In the upcoming months, we will share this work via a number of resources that will enable you to better understand the chemistry of the world around you. We would love for you to join us on this journey (and we promise to keep it *clean* ;-))

When interpreting said evidence during and after the creation of our products, we follow the core principle of toxicology - dose makes the poison. We understand that, while everything around us might pose a life threatening hazard, the circumstances under which we come into contact with this hazard are what truly makes the risk. This risk based approach, coupled with solid regulations across the globe, is what has always allowed us, and virtually all current beauty brands, to ensure your safety. Science has worked very hard to earn your trust and, going forward, we vow to show you exactly how.



Direct hit



Bonus points!

Hint at greater complexity

Link to related myths

Link to critical thinking

Bust myth in a timely manner

Hostile environment

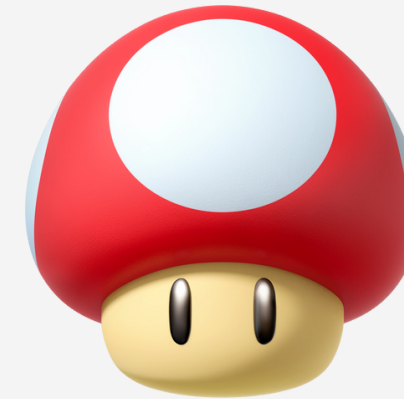
Making information from experts easily accessible

General science education

Educating about cognitive biases and critical thinking



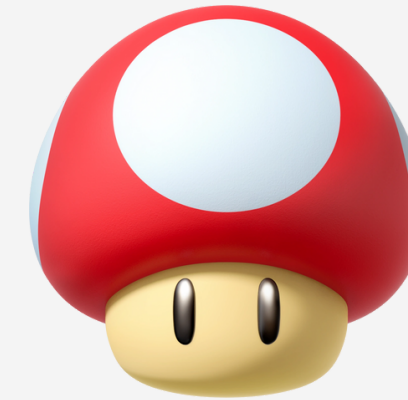
Power-ups for myths



Taps strongly into basic emotions (**fear**, anger, disgust)



Power-ups for myths



Taps into cognitive bias (confirmation bias, appeal to nature fallacy, **appeal to authority**)



What is the difference between chemical and physical sunscreens?

Chemical sunscreens work like a sponge, absorbing the sun's rays. They contain one or more of the following active ingredients: oxybenzone, avobenzone, octisalate, octocrylene, homosalate, and octinoxate. These formulations tend to be easier to rub into the skin without leaving a white residue.


Physical sunscreens work like a shield, sitting on the surface of your skin and deflecting the sun's rays. They contain the active ingredients zinc oxide and/or titanium dioxide. Opt for this sunscreen if you have sensitive skin. However, they are more likely to leave a white "residue" on the skin unless you use a sunscreen that says "tinted" on the label.

Photodermatology, Photoimmunology & Photomedicine

THE OFFICIAL PUBLICATION OF THE PHOTODERMATOLOGY SOCIETY, THE BRITISH PHOTODERMATOLOGY GROUP,
THE EUROPEAN SOCIETY FOR PHOTODERMATOLOGY, THE KOREAN SOCIETY FOR PHOTOMEDICINE AND THE TAIWANESE PHOTOMEDICINE SOCIETY



Original Article |  [Free Access](#)

Metal oxide sunscreens protect skin by absorption, not by reflection or scattering

Curtis Cole , Thomas Shyr, Hao Ou-Yang

First published: 02 October 2015 | <https://doi.org/10.1111/phpp.12214> | Citations: 47

Environmental Toxicology and Chemistry

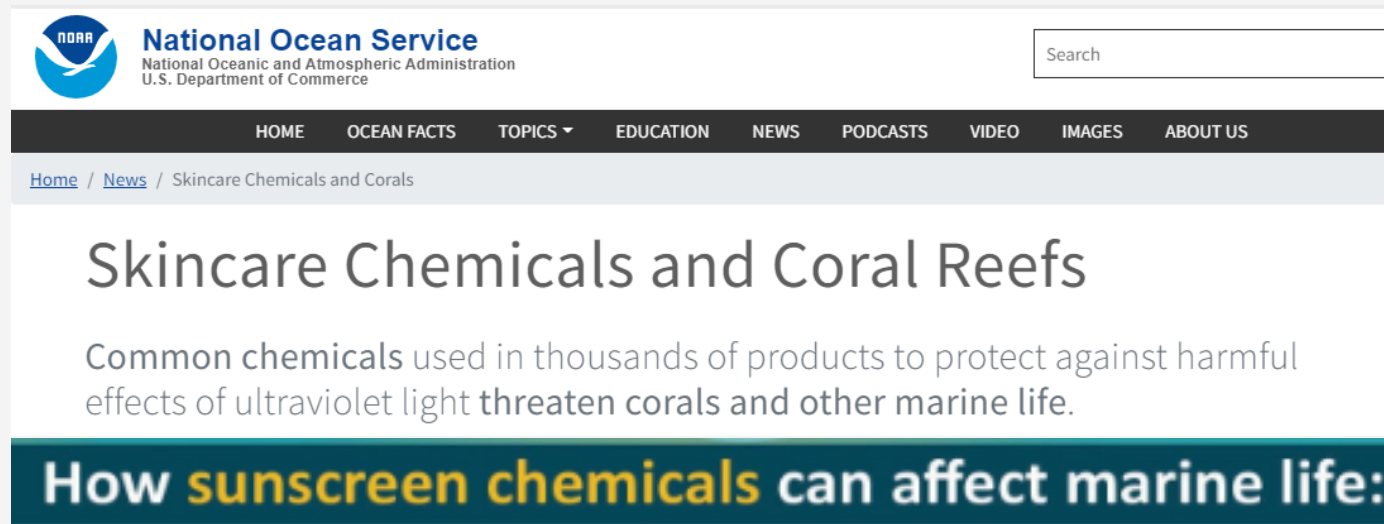
Critical Review | [Open Access](#) |  

A Critical Review of Organic Ultraviolet Filter Exposure, Hazard, and Risk to Corals

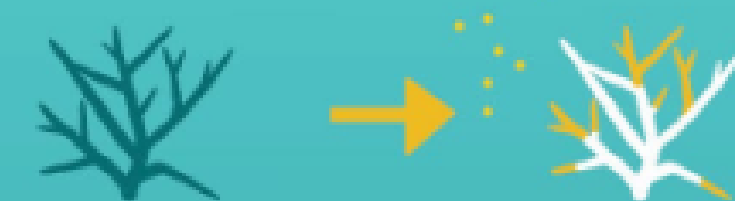
Carys L. Mitchelmore , Emily E. Burns, Annaleise Conway, Andrew Heyes, Iain A. Davies 

First published: 02 February 2021 | <https://doi.org/10.1002/etc.4948> | Citations: 24

“The three main threats to coral reefs are global warming, overfishing and coastal water pollution,” says Prof Terry Hughes, former director of the Australian Research Council Centre of Excellence for **Coral** Reef Studies at Queensland’s James Cook University, and one of the world’s leading coral reef experts. “Coral bleaching is triggered by rising temperatures due primarily to burning fossil fuels. We have already seen three global-scale coral bleaching events due to record-breaking heatwaves, in 1998, 2010 and 2015-2016, which affected 50-70% of tropical reefs. Even the most remote reefs, far from mass tourism or sunscreen, are affected by global warming. There is no scientific evidence that use of sunscreens by people has a harmful effect on coral reefs.”



The screenshot shows the NOAA National Ocean Service website. The header includes the NOAA logo, the text 'National Ocean Service National Oceanic and Atmospheric Administration U.S. Department of Commerce', and a search bar. A navigation menu contains links for HOME, OCEAN FACTS, TOPICS, EDUCATION, NEWS, PODCASTS, VIDEO, IMAGES, and ABOUT US. Below the menu, a breadcrumb trail reads 'Home / News / Skincare Chemicals and Corals'. The main heading is 'Skincare Chemicals and Coral Reefs', followed by a sub-heading: 'Common chemicals used in thousands of products to protect against harmful effects of ultraviolet light threaten corals and other marine life.' A dark teal banner below this contains the text 'How sunscreen chemicals can affect marine life:'.



CORAL: Accumulates in tissues.
Can induce bleaching, damage
DNA, deform young and even kill.

“In my professional opinion, most of the coral reefs in the last 40 years have died because of your bathroom than anything else: climate change, oil spills, what have you...”

- Craig Downs, 2017 talk


CED

CLINICAL AND EXPERIMENTAL DERMATOLOGY
THE EDUCATIONAL JOURNAL OF THE BRITISH ASSOCIATION OF DERMATOLOGISTS



CONCISE REPORT |  Open Access

A qualitative review of misinformation and conspiracy theories in skin cancer

Cathal O'Connor , Siobhan Rafferty, Michelle Murphy

First published: 05 May 2022 | <https://doi.org/10.1111/ced.15249>

radiation in carcinogenesis. Concerns have been raised recently due to reports of toxic effects of oxybenzone and octinoxate on marine ecosystems and high systemic absorption of sunscreen ingredients. While the effect on coral is worrying and cause for further research, there is currently no evidence of adverse health outcomes related to sunscreen use. ⁴

What can we do?

Emotional manipulation with fear:

- Point out the manipulation
- Point out the evidence for more likely fears (skin cancer, blindness from microbial contamination)
- Examples where it didn't work out in the past (MMR vaccines and autism)

Cognitive biases:

- Corporations just want money: Making safer products is cheaper and more profitable (dead people can't buy)
- Scary ingredient names: Bananas have 2-hydroxy-3-methylethyl butanoate

What can we do?

If you could be perceived as an expert:

- Spread correct information
- Be very careful about what you say
- Be explicit about why your information is correct (your scope of expertise, or other experts, or other trustworthy sources)
- Use your voice against misinformation, especially from other perceived experts

Take-home messages

People have an appetite for learning

Debunking misinformation can have big impacts on consumer demand and public health

Empathy are crucial for effective communication

Experts have an enhanced ability to debunk misinformation