

The Evolving Role of Botanicals in Human Health

BY KERRY HUGHES

FYTO VISION 2026
FEB 2026

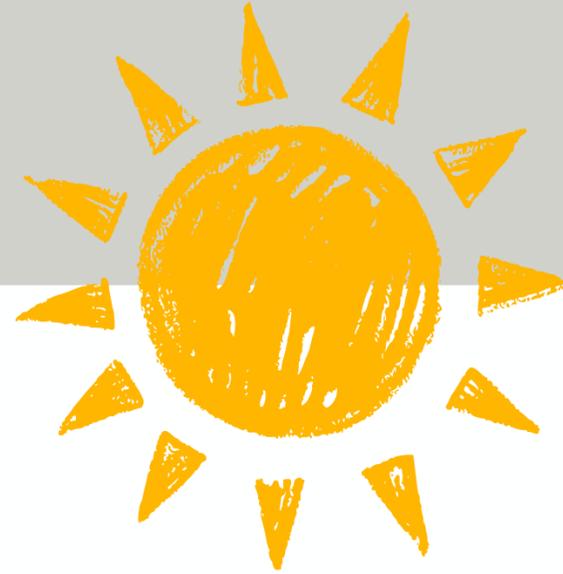


Topics:

- The Photosynthesis Reaction and the Evolution of Humans
- Top Pharmaceuticals from Plants
- Biodiversity, Our Diet & Chronic Disease
- GLP-1 & Bitter Receptors
- The Modern Rise of Herbalism
- Regulatory “Fault Lines”
- Complexity Science & the Real Role of Botanicals
- Regenerative Agriculture
- What’s Old is New Again
- Super Tasters, Chilis & Mexican Herbalism (plus fun Audience Participation Exercise- experiment to see who are Super Tasters in the audience)

Chemistry Quiz:

Can Anyone Tell me What Reaction is This?

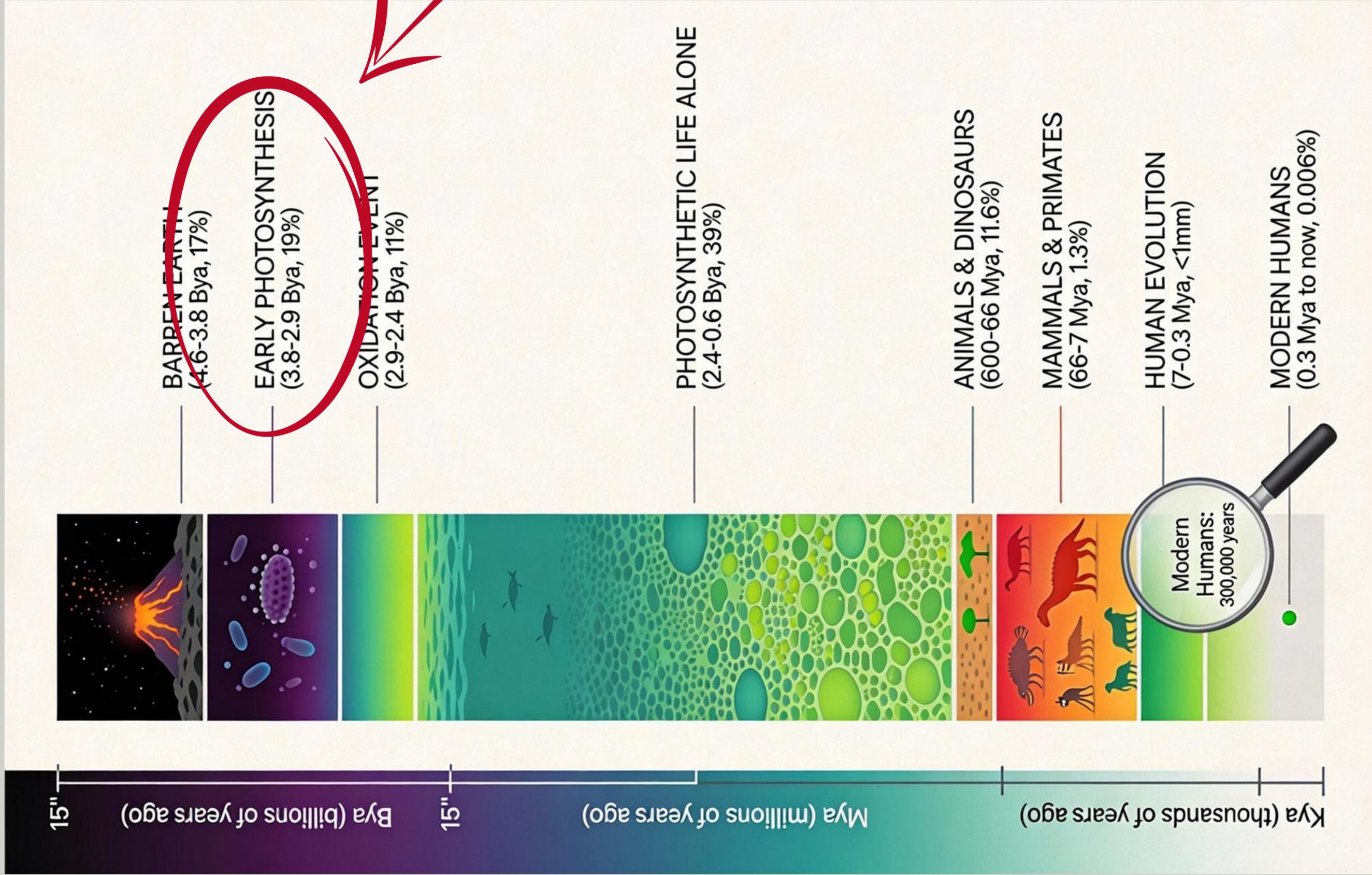


Answer: Photosynthesis!

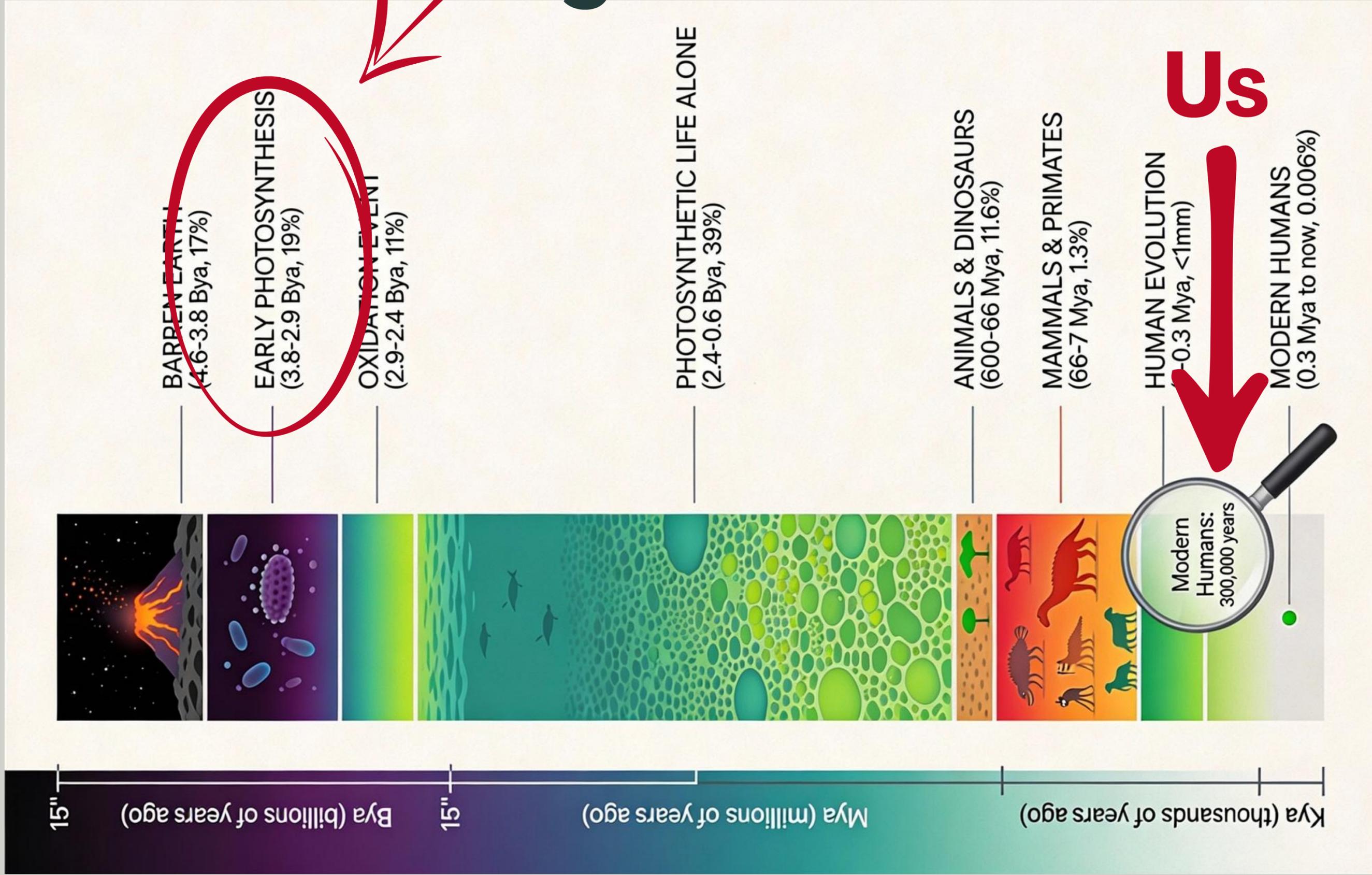
...One of the most important reactions on the planet.



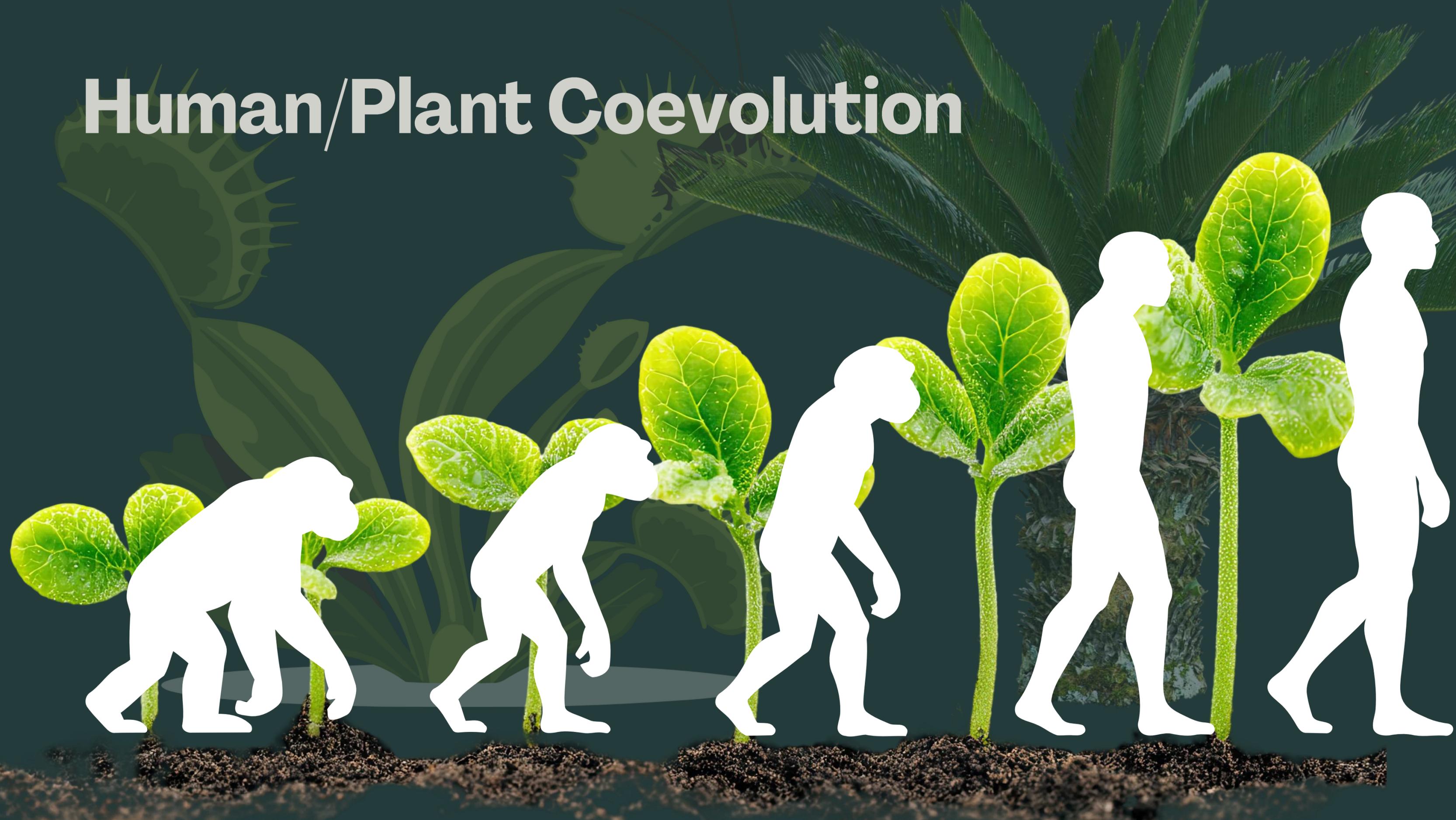
The Photosynthesis Reaction



The Photosynthesis Reaction



Human/Plant Coevolution



Top Pharmaceuticals From Plants

So plants made the world we live in. But they're still critically important to us today. We depend on them: Food, Shelter, Clothing...

Pharmaceuticals-roughly a third to a half of modern drugs are natural-product based — derived from or inspired by molecules from plants, microbes, and other organisms



Aspirin (*Salix alba* - Willow Bark)

- Use: Pain relief, anti-inflammatory, and blood thinner.
- Origin Compound: Salicin.
- History: Originally derived from willow bark, used since ancient Greece for pain relief. Synthesized by Bayer in 1897, becoming one of the first and most widely used over-the-counter drugs. Aspirin remains one of the most widely consumed drugs worldwide for pain relief, cardiovascular health, and anti-inflammatory purposes.



Quinine (*Cinchona* spp. - Cinchona Tree)

- Use: Treatment for malaria.
- Origin Compound: Quinine alkaloid.
- History: Indigenous people in South America used cinchona bark for malaria symptoms, which led to quinine's isolation in 1820. It was the primary antimalarial until synthetic drugs emerged. Still used today for malaria, but largely replaced by modern antimalarials. Quinine is also popular as a flavor in tonic water.



Artemisinin (*Artemisia annua* - Sweet Wormwood)

- Use: Treats malaria effectively, especially resistant strains.
- Origin Compound: Sesquiterpene lactone from *Artemisia annua*.
- History: Revived from ancient Chinese medicine; isolated in the 1970s during Project 523. Currently widely used in artemisinin-based combination therapies (ACTs).



Taxol (*Taxus brevifolia* - Pacific Yew)

- Use: Chemotherapy for cancers, especially breast and ovarian cancer.
- Origin Compound: Paclitaxel.
- History: Discovered in the 1960s by the U.S. National Cancer Institute, Taxol was the first chemotherapy derived from the Pacific yew tree. Remains in high demand for cancer treatments, though semi-synthetic versions and other Taxol-based drugs are now produced.



Vincristine (Catharanthus roseus - Madagascar Periwinkle)

- Use: Chemotherapy for leukemia, Hodgkin's disease, and other cancers.
- Origin Compound: Vinca alkaloids.
- History: Isolated in the 1950s and quickly adopted for leukemia and Hodgkin's lymphoma treatment. Essential in pediatric oncology, with strong market demand as part of chemotherapy regimens.



Codeine (Papaver somniferum - Opium Poppy)

- Use: Pain relief, cough suppression.
- Origin Compound: Alkaloid from *Papaver somniferum*.
- History: Synthesized in 1832 from morphine; became a widely used opiate. Used in prescription painkillers and cough syrups.



Curare (Tubocurarine) (Chondrodendron tomentosum)

- Use: Neuromuscular blocker in surgeries.
- Origin Compound: Alkaloid from Chondrodendron tomentosum.
- History: Used by indigenous South Americans for hunting as arrow poison; developed for muscle relaxation in anesthesia. Replaced by synthetic derivatives like atracurium.



Capsaicin (From Chilis)

- Use: Pain (topical) is approved FDA Drug, other injectable versions are candidates
- Origin Compound: capsaicin
- History: used to fumigate homes, drive off the evil eye, and 'heat up' cold illness in curanderismo. Burning chilis to cleanse a house, hanging strings of pods to protect children, or adding chile to ritual brews all reflect the same idea: this is a fiery being that can burn away what harms and wake up what has gone dull or weak in the body–spirit.



Biodiversity, Our Diet & Chronic Disease



Our Current Food Supply

-75%

•Since early 1990's 75% loss of the Biodiversity in our Diet!!

4%

•As we have shifted to mass agriculture => to high-yield staples of wheat, corn, rice and soy

50%

•Only 3 plants account for approx.50% of the calories we consume (rice, wheat, corn)

-150

•According to the FAO, between 2000-2018 more than 150 livestock breeds have gone extinct!



Why A More Diverse Diet?

- While the shift in agriculture has resulted in cheap source of calories, the cost has been very steep.
- Eating a diet of refined & processed foods fueled a surge of type 2 Diabetes and other “western” diseases
- Compared to native (heirloom) & wild varieties, these modern bred “high yield” staples have ↑ Sugar and ↓ Bitterness
- ALSO ↓ Fiber, ↓ Proteins, ↓ Vitamins, ↓ Minerals

**Ancestor of Modern Corn =
30% Protein & 2% Sugar**



**Today's “Super Sweet” Varietals
=
40% Sugar & 3% Protein**

Western Diseases Linked to SAD Diet

- 
- Cardiovascular Disease
 - Diabetes
 - Obesity
 - Cancer Risk
 - Metabolic Syndrome
 - Changing the Gut Bacteria - Dysbiosis
 - Increasing Risk of Infection

GLP-1 and Bitter Receptors

GLP-1 DRUG POPULARITY

Massive rise in GLP-1 drugs (like Ozempic and Wegovy) are having dramatic effects on chronic disease, particularly obesity and type 2 diabetes.

GLP-1 PRODUCED BY BITTER RECEPTORS

Consuming bitter compounds, they activate taste receptors called TAS2Rs that line your entire digestive tract. These receptors trigger the release of GLP-1 and other hormones that regulate appetite, blood sugar, and metabolism.

We've engineered bitterness out of our diet, and now we have to replace the hormones it used to produce through pharma!



The Modern Rise of Herbalism

THE NATURAL PRODUCTS INDUSTRY

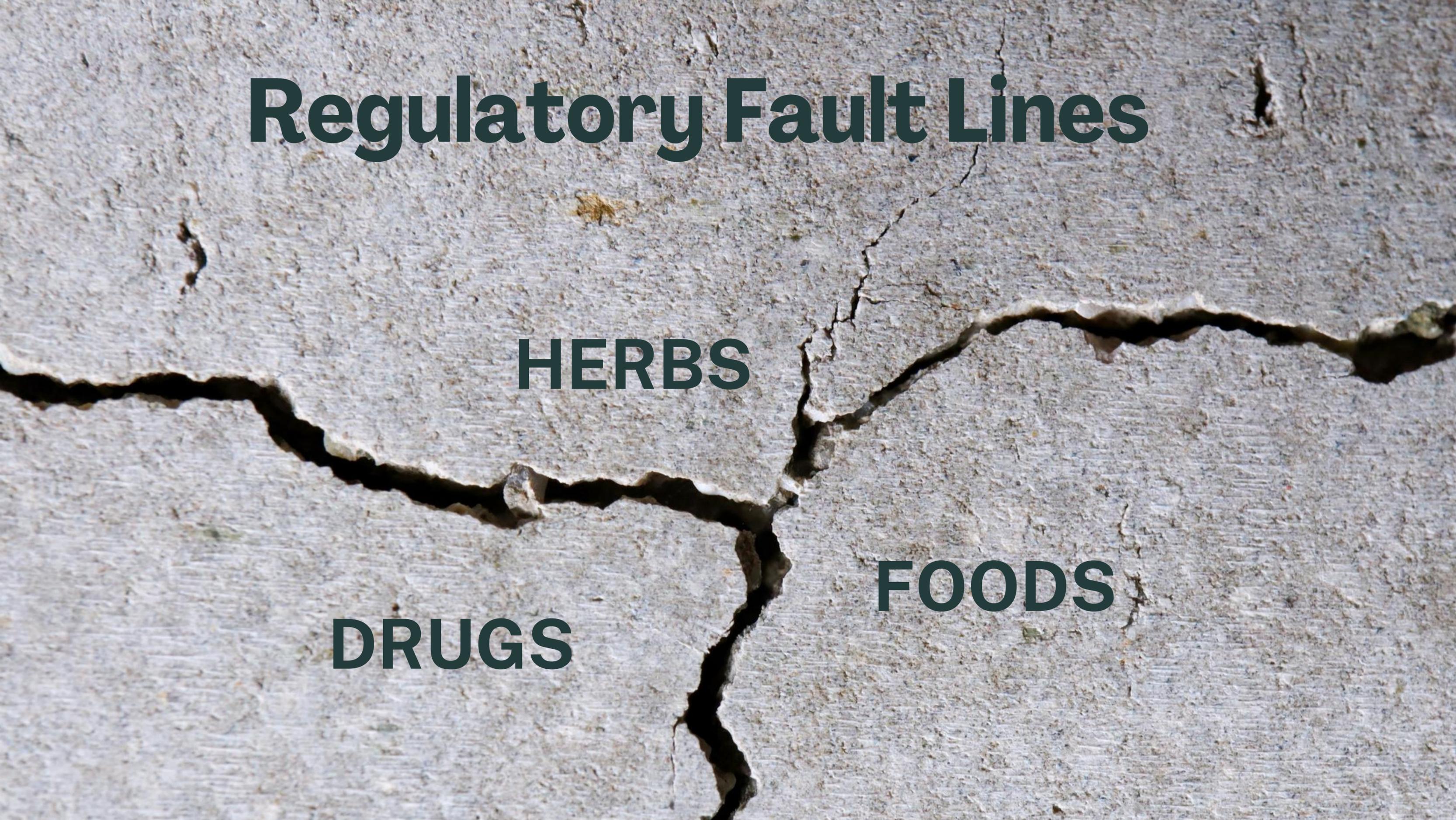
Hippie-led movement with healthfood stores in the US.
Europe kept their tradition

PASSAGE OF DSHEA (DIETARY SUPPLEMENT HEALTH & EDUCATION ACT OF 1994)

There was more mail sent to Congress in support of DSHEA than anything since the Vietnam War. The American public mobilized at a scale we rarely see because they wanted access to herbs, vitamins, and supplements!



Regulatory Fault Lines

A close-up photograph of a light-colored, textured concrete wall. A prominent, jagged crack runs horizontally across the middle of the frame, with several smaller cracks branching off from it. The crack is deep and dark, revealing the interior of the wall. The overall appearance is one of structural wear and tear.

HERBS

FOODS

DRUGS

Functional Medicine

UPSTREAM FOCUS

Functional medicine is a systems-based, root-cause approach to healthcare that looks at how genetics, environment, and lifestyle interact, and then uses personalized interventions (especially nutrition supplementation, herbals and lifestyle) to restore healthy function rather than just suppress symptoms.

Through Functional Medicine, Science is moving upstream ...

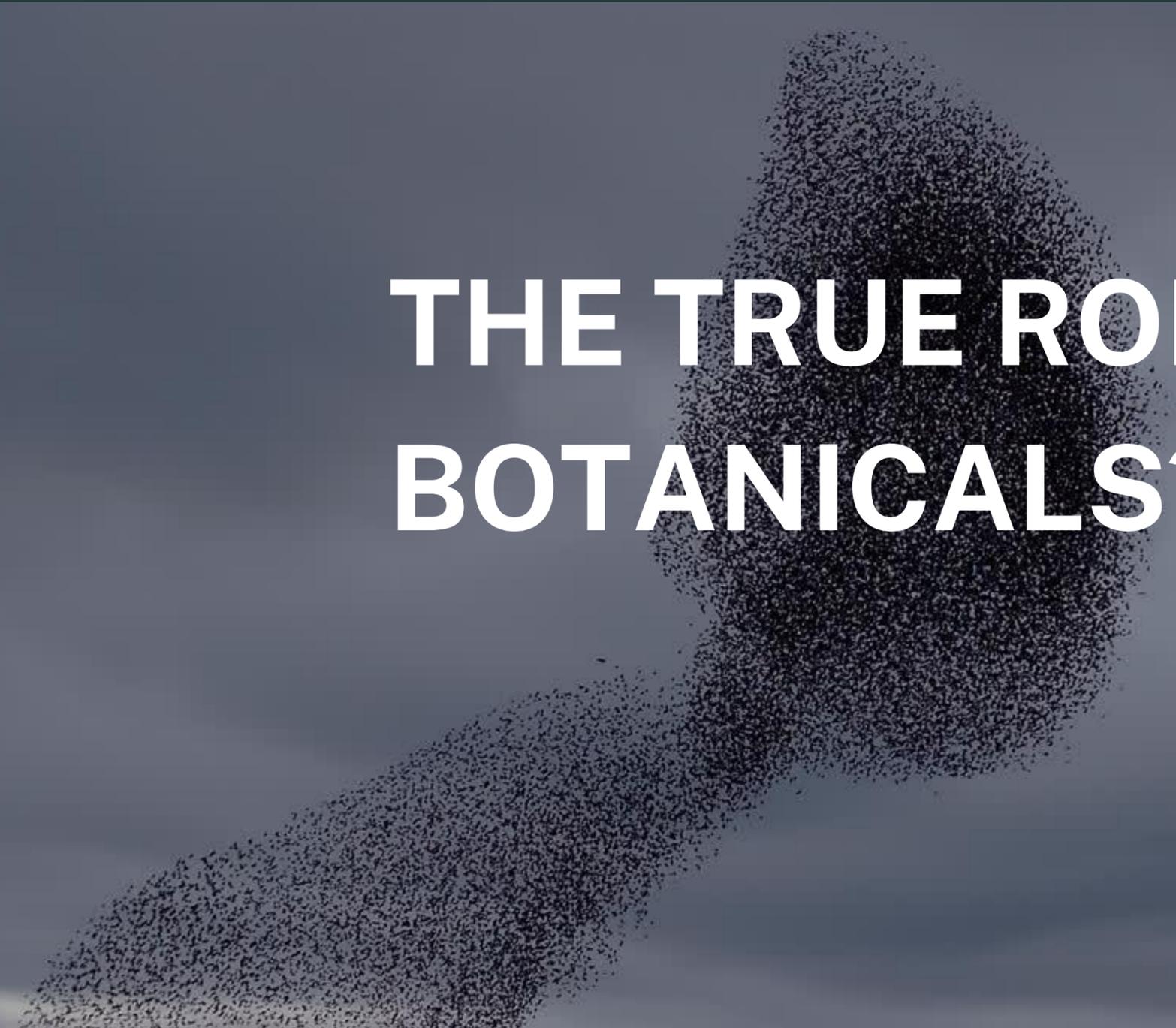
INFLECTION POINT IN SCIENCE

Here we are seeing healthcare is not evolving incrementally...

It has crossed a structural inflection point.

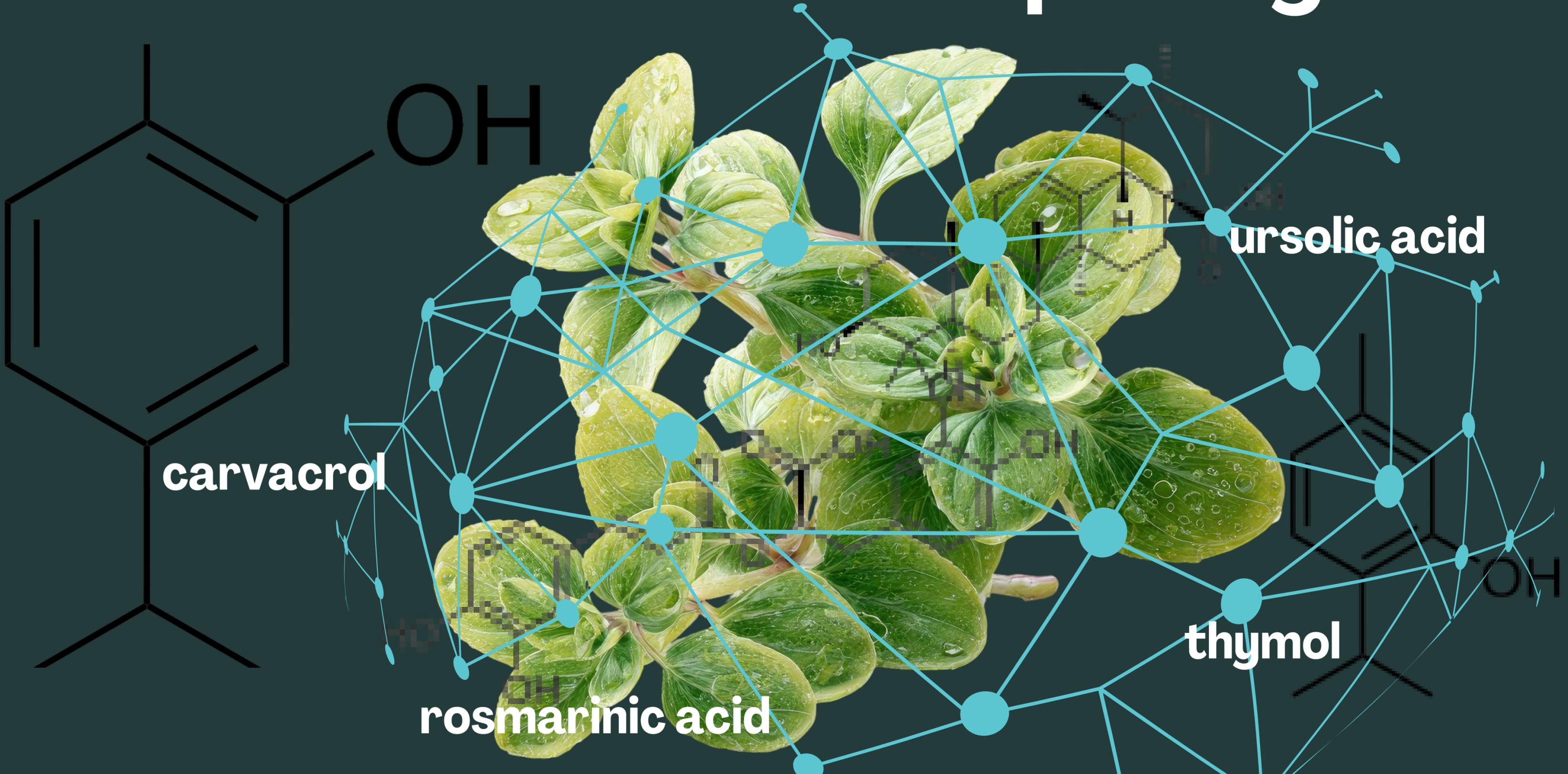


Enter... Complexity Science



**THE TRUE ROLE OF
BOTANICALS?**

Botanicals are Complexity



Regenerative Agriculture



...Complexity in Agriculture

What's Old is New Again

A Short History of Medicine aka. The Evolving Role of Botanicals in Human Health

"Doctor, I have an ear ache."

2000 BC - "Here, eat this root."

1000 BC - "That root is heathen, say this prayer."

1850 AD - "That prayer is superstition, drink this potion."

1940 AD - "That potion is snake oil, swallow this pill."

1985 AD - "That pill is ineffective, take this antibiotic."

2000 AD - "That antibiotic is artificial. Here, eat this root!"

2026 AD - "Give me the Root that through Complexity gets to the Root Cause!"

Audience Participation Exercise: **Super Tasters, Chilis & Herbalism**

SUPER TASTERS

A supertaster is someone whose sense of taste (especially for bitter) is much more intense than average, usually because they have a higher density of fungiform papillae (taste buds) on the tongue and carry specific bitter-taste gene variants such as TAS2R38.

CHILIS & SUPER TASTERS

Being a supertaster is associated with experiencing the “heat” of chilis as more intense and often more unpleasant than average. There is some emerging evidence that some people may derive more metabolic benefit from bitter exposure than others



Thank you

Let's Connect!

On Linked In:

Kerry Hughes

The Ethnobotanical Explorer

www.Ethnopharm.com

