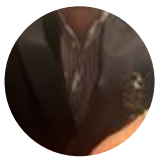

George Ferman
@Helios_Movement

Nov 1 • 22 tweets • 17 min read • Read on X

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Most people still don't truly understand the impact of thyroid dysfunction.

The thyroid gland directly communicates with the brain, the pituitary, the parathyroid, the pancreas, the liver, the adrenal glands, the intestinal system and much more.

You already know this to be true if you are suffering from any type of thyroid dysfunction but here's an example i always try to mention.

Let's suppose that you want to lose weight, well in order to put in perspective how much the thyroid gland affects our metabolism, resistance training which is promoted as one of the best tools to increase BMR, can only lead to a 10% increase (which is still great).

Now here's what's fascinating, untreated hypothyroidism can lead to a BMR that's even 40% below normal and an even 50mcg of T3 day can increase BMR by even 30% in some cases.

You can also look into for example how T3 influences the tight junctions, how it upregulates the LDL-receptor, how it helps with the release of bile or even how it facilitates the production of lactase in the intestinal tract so thyroid dysfunction could even make you react badly to dairy.

In some studies, up to 90.5% of depressed people have subnormal T3 levels.

So thyroid dysfunction could lead to things such as:
-A variety of gut issues
-Severe fatigue
-Hair loss
-Depression
-High LDL
-Insulin resistance/metabolic dysfunctions
-Low libido
-Low testosterone
and more.

Here's how you can support its function.
Thread 🧵

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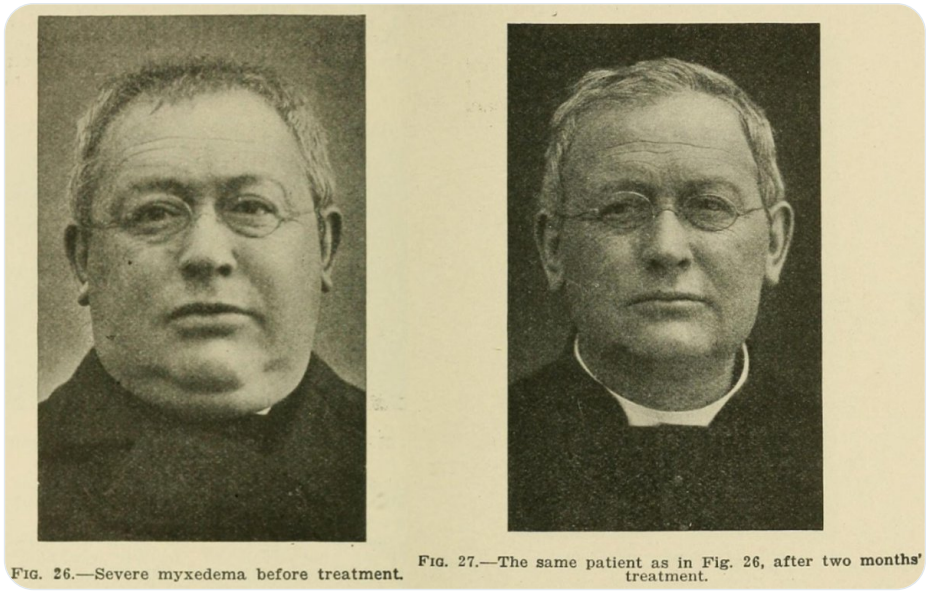


Fig. 26.—Severe myxedema before treatment.

Fig. 27.—The same patient as in Fig. 26, after two months' treatment.

Standard disclaimer that nothing in this thread should be used as a substitute for medical advice

It's George.

Let's start with the basics.

The thyroid gland is a 2-inch-long gland that weighs less than 1 ounce and is located in the front of the neck below the larynx.

It has two lobes, one on each side of the windpipe which leads to its “butterfly” shape.

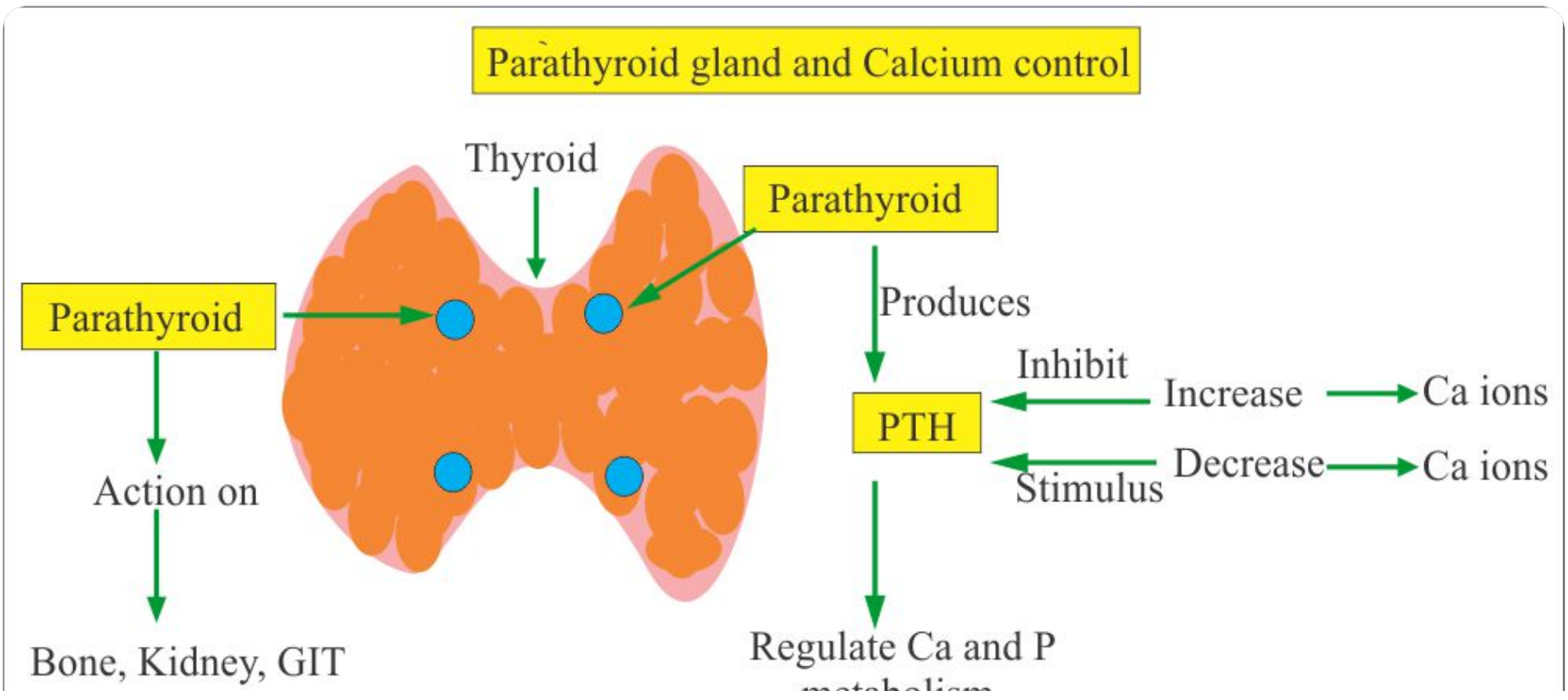
The thyroid is one of the glands that make up the endocrine system.

The glands of the endocrine system produce and store hormones and release them into the bloodstream.

The hormones then travel through the body and direct the activity of the body’s cells.

The thyroid gland makes two thyroid hormones:

-Triiodothyronine (T3)
and
-Thyroxine (T4)



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Some of the functions of T3 include increasing the metabolic rate, heart rate and aiding in thermogenesis and some of the functions of T4 include lowering blood calcium by inhibiting osteoclasts and increasing renal calcium excretion.

T3 is made from T4 and is the more active hormone, directly affecting the tissues.

When (inactive) T4 is released into the bloodstream, it goes to the liver and other organs to be converted into (active) T3.

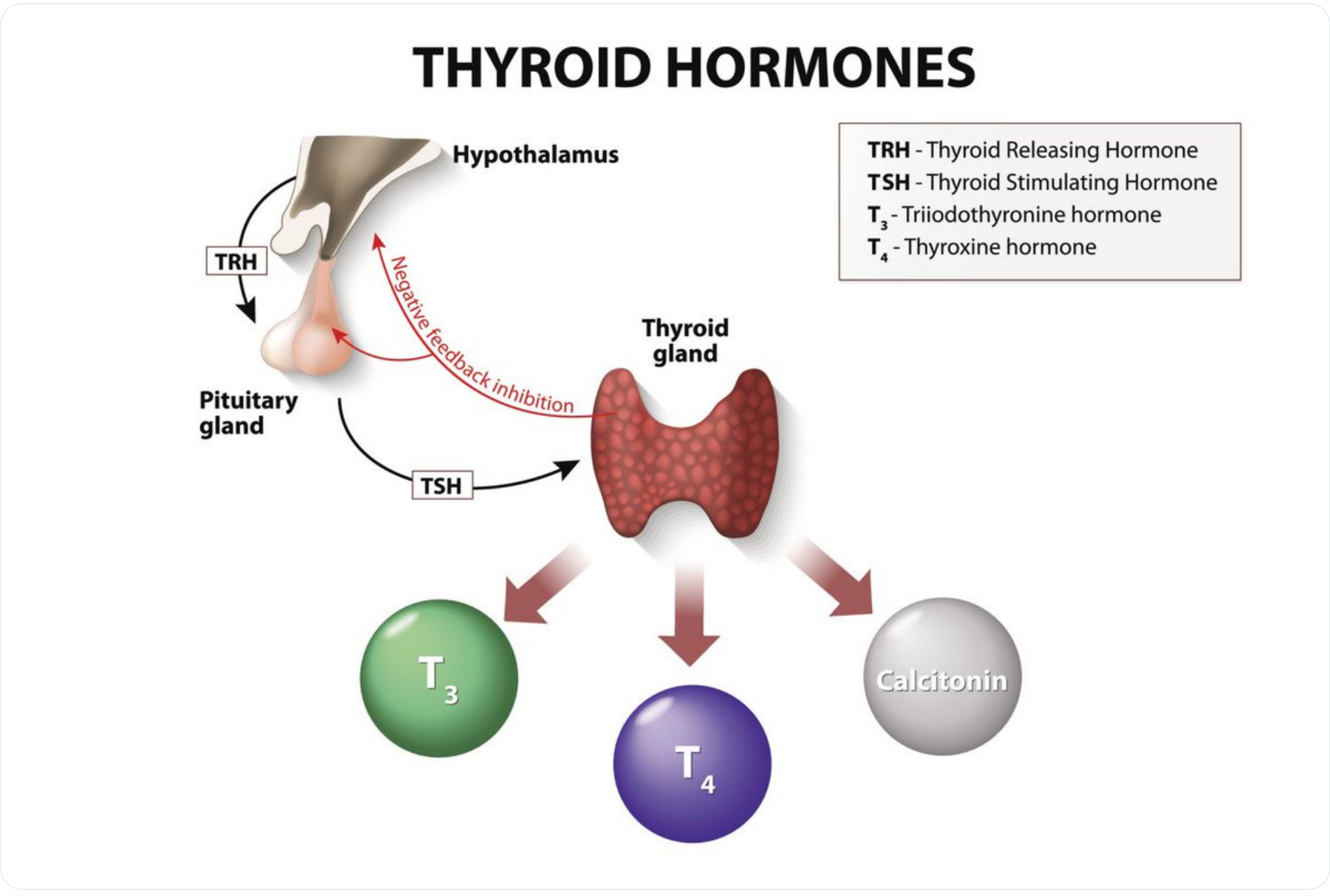
This conversion is known as deiodination of T4 and is a process which happens primarily within the liver and organs such as the kidneys and small intestines.

This is the primary action of the thyroid and the second one is to regulate circulating calcium levels (by using calcitonin which regulates too much calcium) along with the parathyroid and its PTH (parathyroid hormone which regulates too little calcium).

Thyroid hormone production is regulated by thyroid-stimulating hormone (TSH), which is made by the pituitary gland in the brain.

When thyroid hormone levels in the blood are low, the pituitary releases more TSH.

When thyroid hormone levels are high, the pituitary responds by dropping TSH production.



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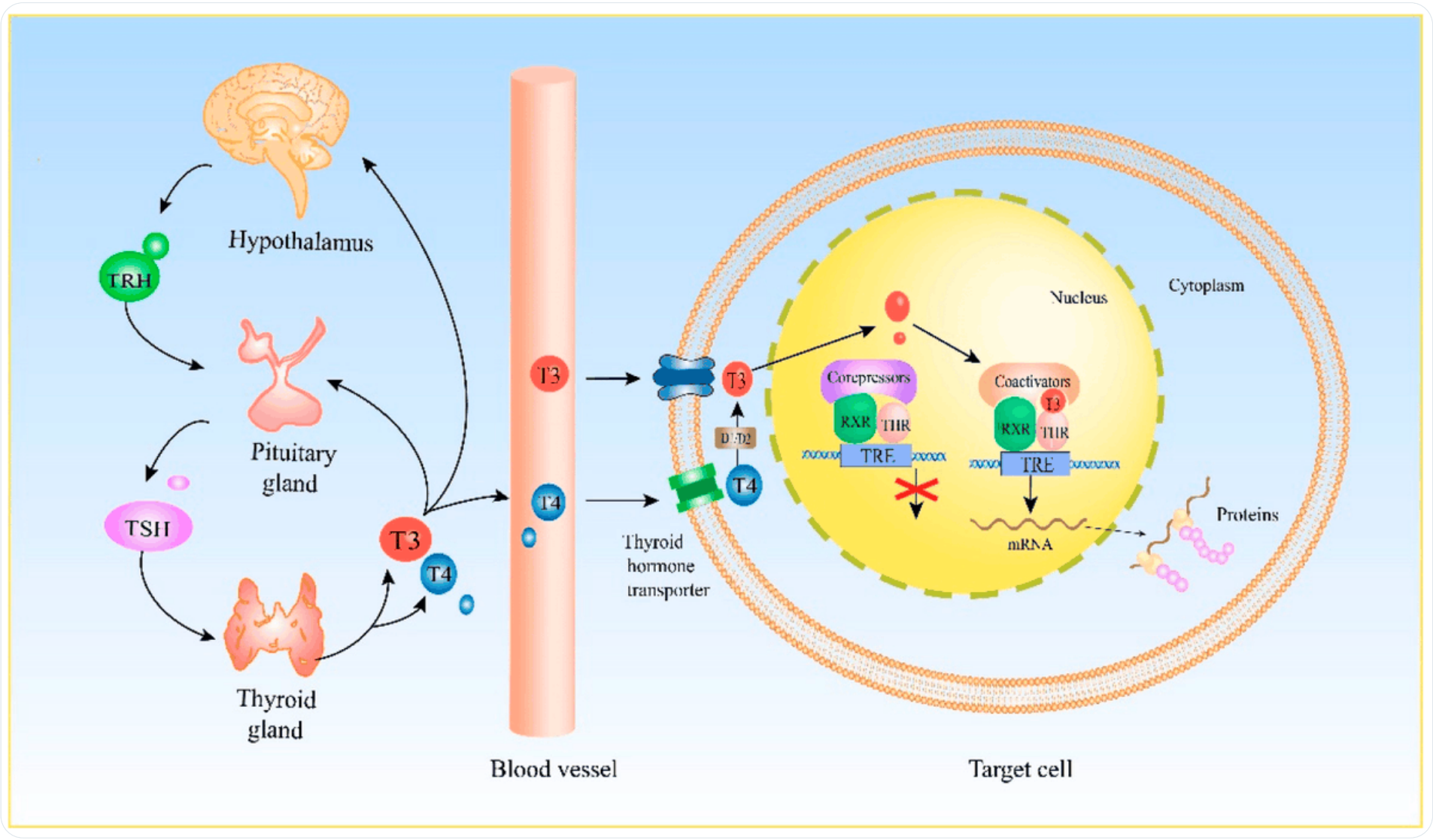

Now of course, the functions of thyroid hormones depends on the thyroid hormone receptors (TRs).

Why do we need them?

Because the places where hormones in general are produced and the places that are utilized are not the same.

Here's a geek sections about them.

Thyroid hormone receptors are intracellular proteins that bind thyroid hormones (primarily triiodothyronine (T3)) and function as ligand-activated transcription.

They are encoded by two genes, THRA (on chromosome 17q11) and THRB (on chromosome 3p24), producing multiple isoforms via alternative splicing:

-TRα1: Widely expressed, particularly in the heart, brain, and skeletal muscle; critical for cardiac and neurological functions.

-TRα2: Abundant in the brain but does not bind T3 (lacks a functional ligand-binding domain), may act as a dominant-negative inhibitor.

-TRβ1: Predominant in the liver, kidney, and pituitary; key for regulating metabolism and cholesterol.

-TRβ2: Restricted to the pituitary, hypothalamus, and retina; regulates the hypothalamic-pituitary-thyroid (HPT) axis and vision.

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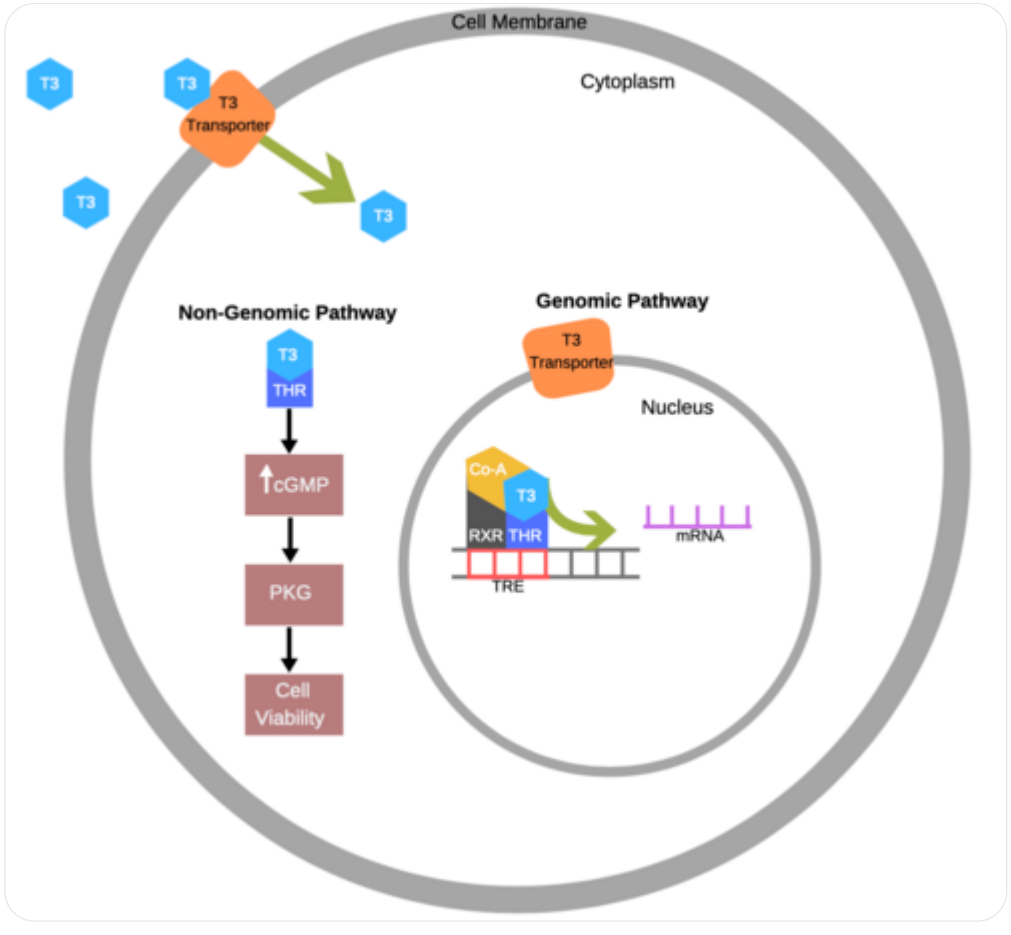
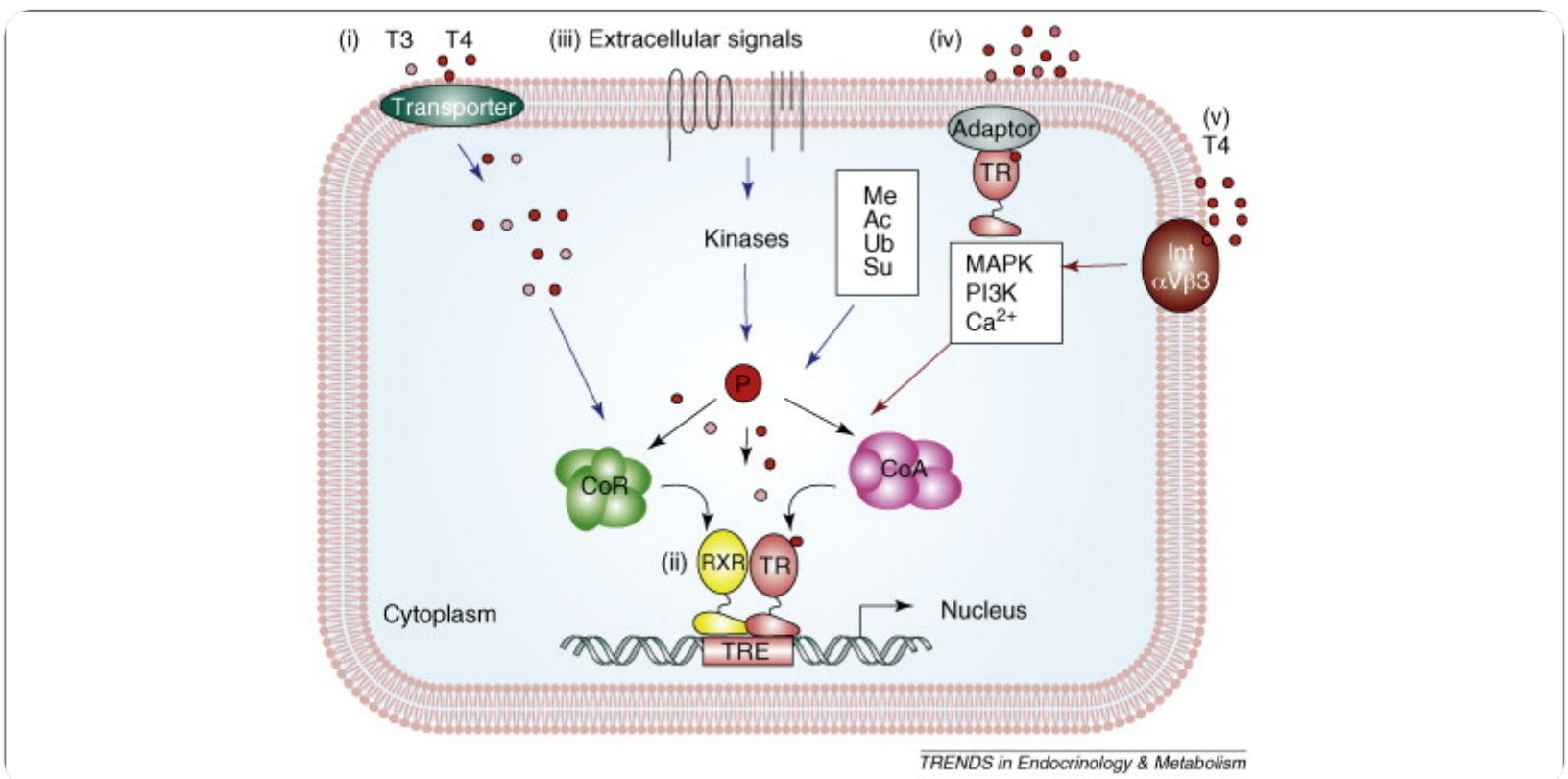


When it comes to their effects, they of course increase basal metabolic rate, oxygen consumption, and thermogenesis by mechanisms such as upregulating genes like UCP1 (uncoupling protein 1) in brown fat, enhancing heart rate, contractility, and cardiac output by regulating ion channels and contractile proteins, managing cholesterol by inducing CYP7A1 (bile acid synthesis) and LDLR, influencing muscle function, red blood cell production, gut motility and much more.



They (TRs) have a modular structure that consists of an N-terminal domain (NTD), a DNA-binding domain (DBD), a hinge region and a ligand-binding domain (LBD).

Unlike androgen and estrogen receptors, which primarily activate genes, TRs can repress genes in the presence of T3 (in their inactive state TRs are often bound to DNA and associated with co-repressors).

In the absence of T3 for example they bind to TREs as monomers, homodimers or heterodimers with retinoid X receptors (RXRs). They recruit co-repressors which compact chromatin through histone deacetylation, repressing gene transcription.

If/when T3 (or less potently T4) enters the cell, it binds the LBD, and induces a conformational change in the TR. Then co-repressors are released, and co-activators are once again recruited, promoting histone acetylation and

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The TR-RXR-T3 complex activates or represses target genes, depending on the TRE and co-regulators.
The main things that regulate TRs include ligand availability, receptor expression, co-regulators, phosphorylation or acetylation, RXR heterodimerization, feedback loops.

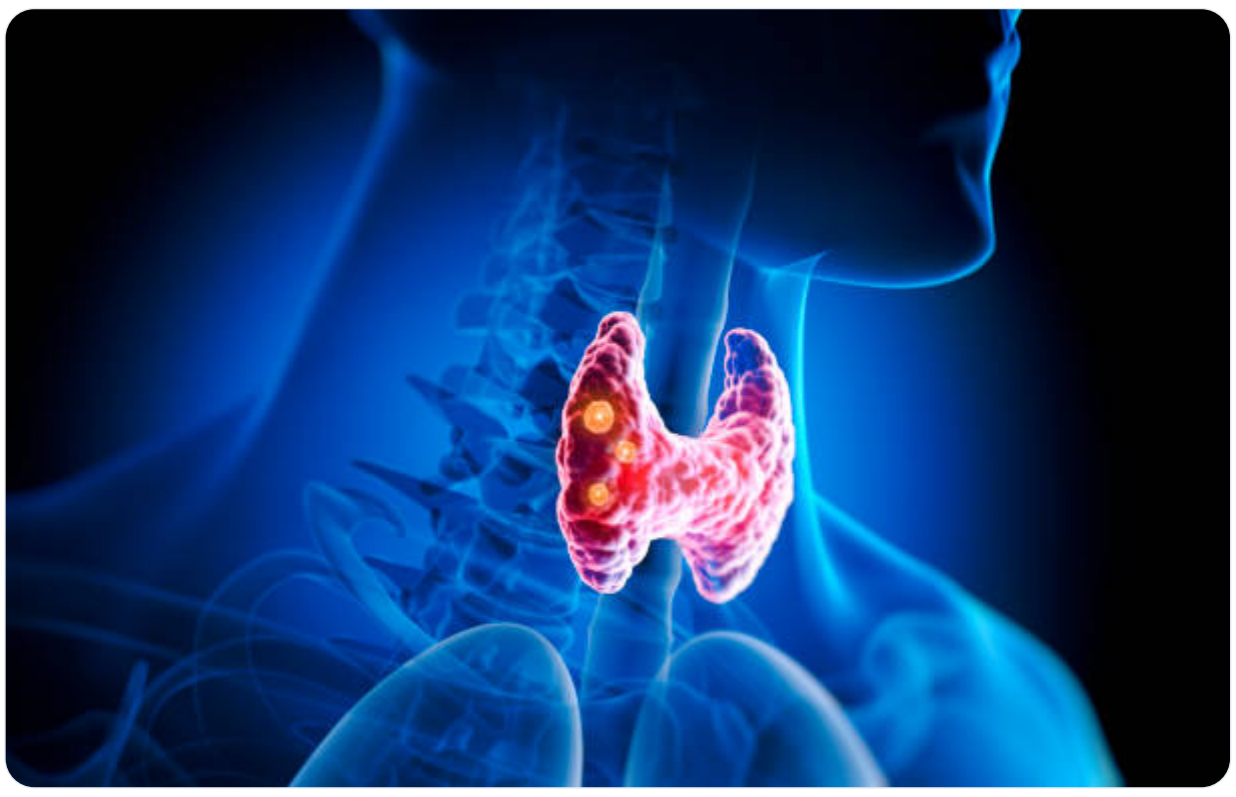
Now some potential signs that could very well indicate that you must pay attention to your thyroid include:

-Cold intolerance
-Low body temperature
-Fatigue
-Dry skin
-Hair thinning
-Constipation and gut issues related to pathogen overgrowths
-Poor appetite
-Low libido
Of course, all these could be caused by other things besides a dysfunctional thyroid gland.

This is why the term potential signs was used.

So, if you have a couple of these, it would be a good idea to test the following markers:

1)TSH
2)Total T4
3)Total T3
4)Reverse T3
5)Free T4
6)Free T3
7)Thyroid antibodies



But the question remains how can you support your thyroid gland so let's check out some suggestions.

Number 1: Providing enough:

-Selenium since it is a cofactor for deiodinases (D1, D2), which convert T4 to T3.

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-Zinc since it supports TR function by stabilizing the DNA-binding domain and enhancing T3 binding affinity.

It also promotes T4-to-T3 conversion and synergizes with selenium for deiodinase activity.

-Magnesium since it enhances T4-to-T3 conversion by supporting deiodinase activity.

-B vitamins since they support thyroid hormone synthesis and T4-to-T3 conversion by aiding energy metabolism and reducing oxidative stress.

B12 and B6 also support methylation, which influences TR expression epigenetically.

-Copper, vitamin C, retinol, iodine and calcium are also important.

Suggestion number 2: Understand the impact of stress.

With the term "stress" over here, we are not only referring to everyday low-grade anxiety but also chronic dieting, excessive fasting (especially "fasting" with 4 cups of black coffee) and working out too much for example.

Make no mistake, most people need to diet and train harder but come on, this is a small profile and if you are reading this, you're probably training for a while and have been dieting.

So if you are redlining your body through dieting multiple times per year, working late hours with stimulants and adding vigorous training on top, slow down.

All of these such as the suggestion to stop fasting too much are of course backed up:
pubmed.ncbi.nlm.nih.gov/3051835/
pubmed.ncbi.nlm.nih.gov/6694567/
pubmed.ncbi.nlm.nih.gov/27540343/

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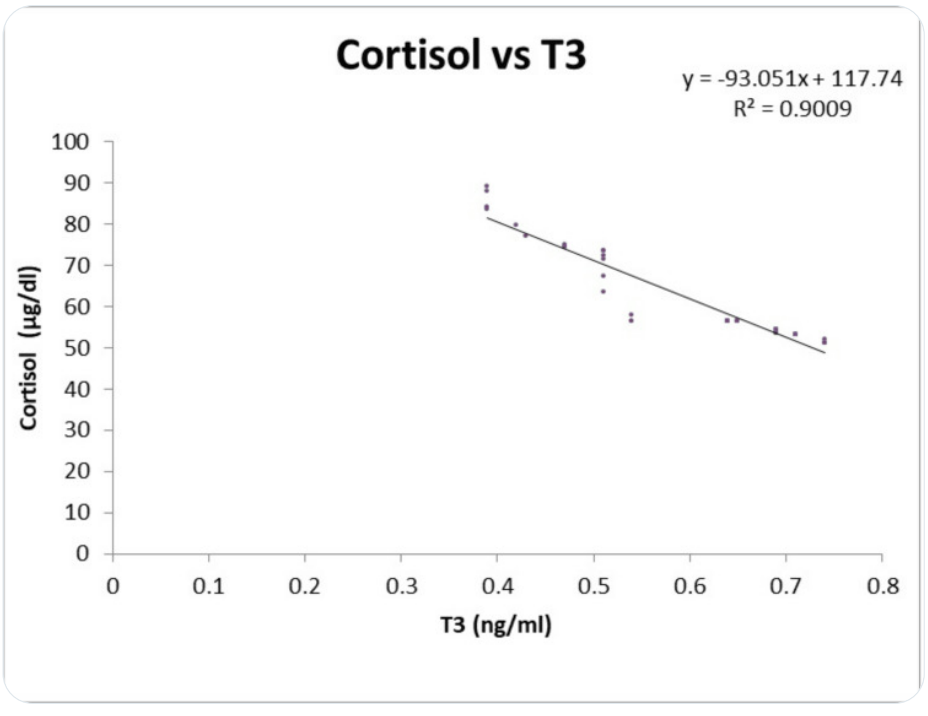
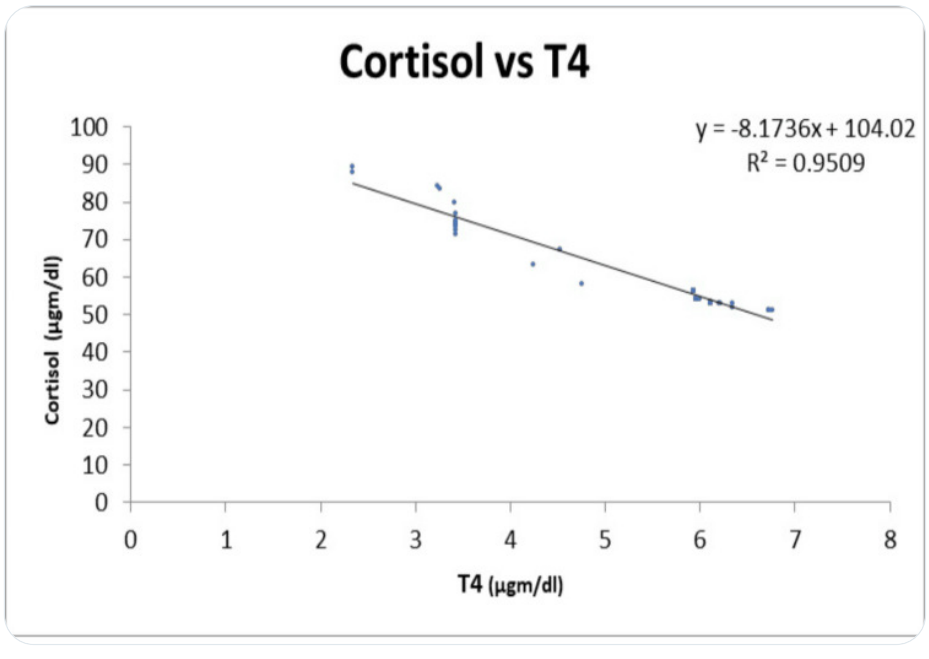
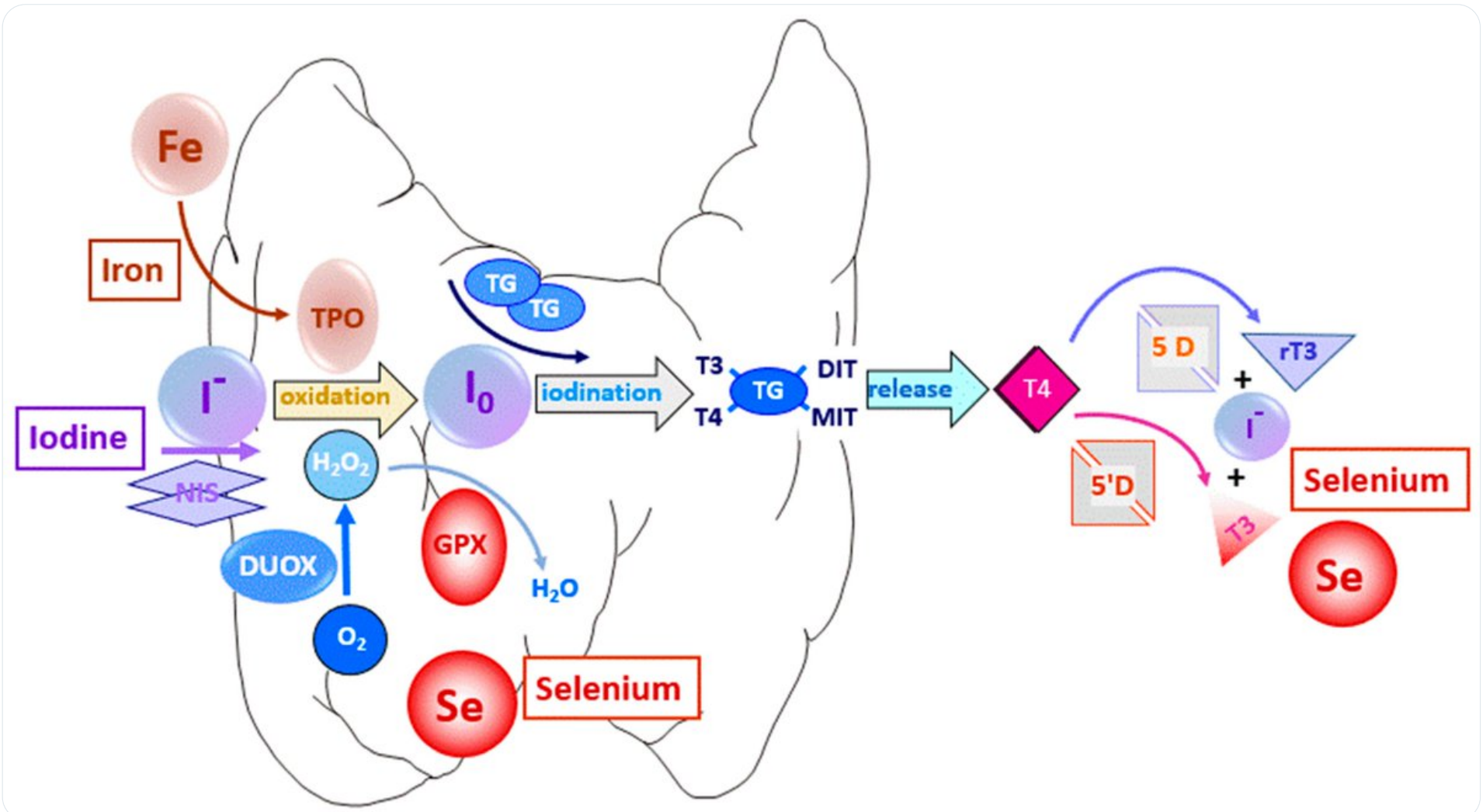




Suggestion number 3: Don't be vegan or vegetarian.

Heme iron for example is essential for thyroid peroxidase (TPO), which synthesizes T3/T4, and also supports deiodinase activity.

pubmed.ncbi.nlm.nih.gov/12097675/
pubmed.ncbi.nlm.nih.gov/2498473/



Suggestion number 4: Go to sleep.

Sleep regulates the HPT axis, stabilizing T3/T4 production and TR expression.

Poor sleep also increases cortisol, which represses TR signaling through GR.

pmc.ncbi.nlm.nih.gov/articles/PMC88…

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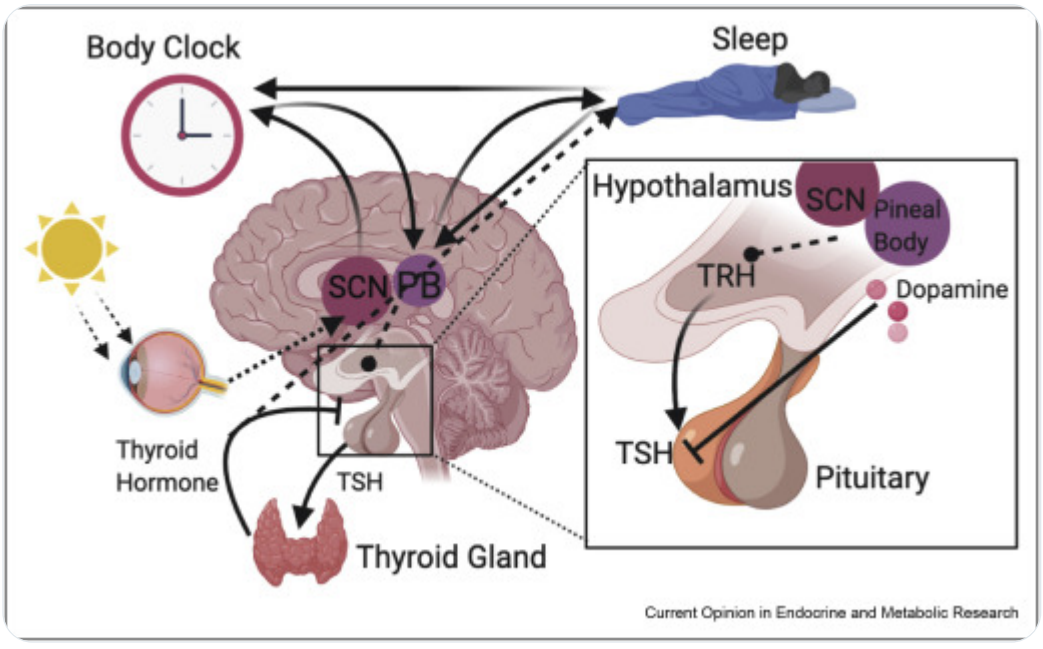


https://pmc.ncbi.nlm.nih.gov/articles/PMC8848531/

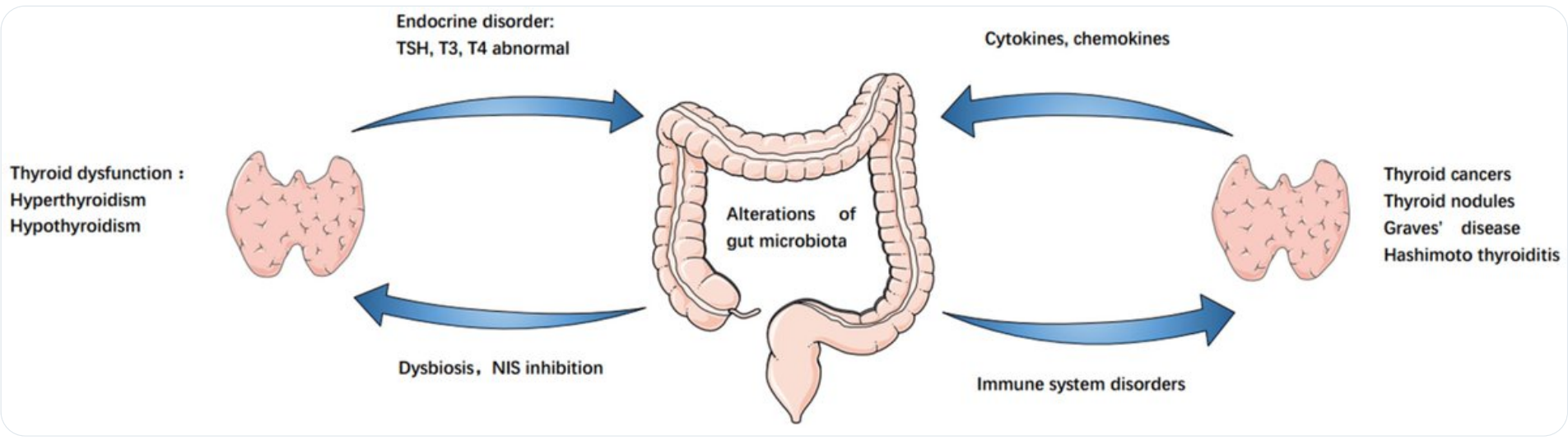
Suggestion number 5: Take care of your gut and the liver.

The active thyroid hormones, are converted to a certain extend in these.

For example part of deiodination happens in the small intestines, so an unhealthy gut will directly affect our thyroid.

This happens because thyroid hormone in a healthy gut reacts with acetic acid which activates it and transforms T4 into T3.

If the gut is in a state of dysbiosis and producing very little acetic acid, T3 fails to activate and thus results in functional hypothyroidism (conversion problems).



Suggestion number 6: Avoid hallogens (and toxins overall).

Start by doing the following:
-Stop using plastic
-Replace your hygiene and cosmetic products with more natural ones
-Replace your commercial toothpaste with a fluoride free one (you can also make your own, there are countless recipes)
-Avoid unfiltered tap water and install a RO in your house
-Do not use commercial mouthwash
-Check the label on your medications to see if fluoride is in there.

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Crit Rev Toxicol. 2024 Jan;54(1):2-34. doi: 10.1080/10408444.2023.2295338. Epub 2024 Feb 6.

Systematic review of epidemiological and toxicological evidence on health effects of fluoride in drinking water

Mohamed Kadry Taher [1 2 3], Franco Momoli [2 4], Jennifer Go [2 4], Shintaro Hagiwara [3 4], Siva Ramoju [4], Xuefeng Hu [5], Natalie Jensen [2 4], Rowan Terrell [2 4], Alex Hemmerich [4 6], Daniel Krewski [1 2 3 4]

Suggestion number 7: Sunlight + red light therapy.
pmc.ncbi.nlm.nih.gov/articles/PMC55…
sciencedirect.com/science/articl…

Suggestion number 8: Block the artificial blue light when possible.

"What?!"

Yeah. Light is a signal for our overall physiology in general, so of course artificial blue light can negatively the thyroid.

Wild study:

https://pmc.ncbi.nlm.nih.gov/articles/PMC10236487/

Suggestion number 9: Avoid the overconsumption of goitrogens and once again, vegan diets.

The first can even cause a goiter if you are in a compromised state.

In general the "big guns" for most people are: broccoli, cabbages, cauliflower, kale, brussels sprouts, canola oil and mustard seeds.

Can you eat these on occasion? Yeah.
But these are often promoted as "health foods" and a lot of people tend to eat them even daily.

When it comes to vegan diets, there are plenty of nutrients that a vegan diet lacks and are crucial for the thyroid gland such as B12 for example.

Then, another problem with vegan diets is the overconsumption of plants.

Key word: Overconsumption.

Plants can be a great part of our diets, but if you want to consume your daily calories just from plants, there is a good possibility that you will overconsume the wrong type of plants full of protease inhibitors, phytic acid, oxalates

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Of course, there are plenty of other issues with this way of eating like the cyanogenic glucosides which interfere with iodine absorption and metabolism and will also negatively affect the gut both directly but also indirectly by affecting things such as the thyroid gland and thus creating a vicious loop.

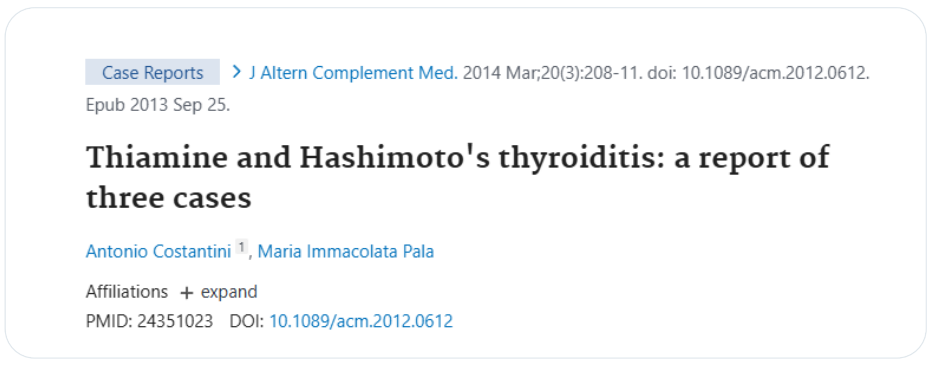
Suggestion number 10: Boost glutathione production.

Glutathione is naturally produced in the cytosol (an intracellular matrix) and helps with many processes varying from detoxification, protecting the mitochondria from oxidative stress, heart health and the immune system all the way to thyroid hormone conversion.

101:
1)Consume sulfur rich foods such as fish, beef, onions and garlic (if you have an issue with sulfur, make sure to get enough CoQ10 and molybdenum).
2)Consume vitamin C and E rich foods.
Vitamin C maintains the body's supply of antioxidants, including glutathione and helps reprocess glutathione by converting oxidized glutathione back to its active form.
3)Consume selenium rich foods.
Selenium is a glutathione cofactor, meaning it's a substance needed for glutathione activity and will lead to increased glutathione peroxidase levels.
4) Get enough glycine, magnesium and B vitamins (especially B2).
5) Cycle low dose NAC (because it can 100% negatively affect zinc:copper balance/homeostasis)
6) Avoid things such as ibubrofen
pubmed.ncbi.nlm.nih.gov/23219737/

Note 1: General supplemental tools.
-Fish head soup (or a soup that has the thyroid gland)
-Pineapple (not a joke, in the pic)
-Cordyceps
-Taurine
-Chrysin rich foods
-Thiamine

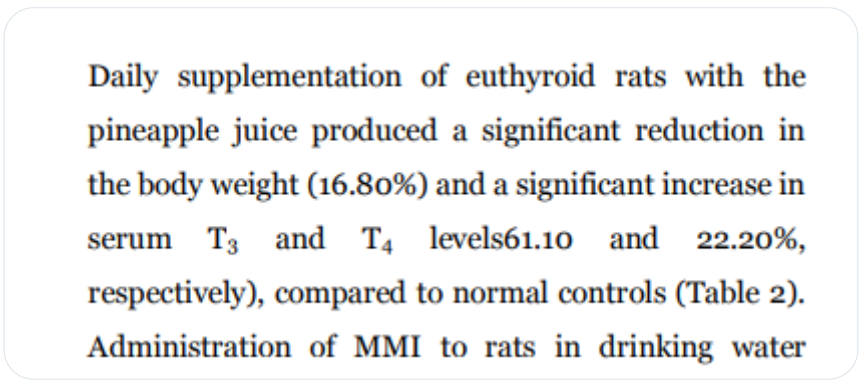
Note 2: Tools for hyperthyroidism.
-Ubiquinol
-Lycopus europaeus
-L carnitine


Case Reports > J Altern Complement Med. 2014 Mar;20(3):208-11. doi: 10.1089/acm.2012.0612. Epub 2013 Sep 25.

Thiamine and Hashimoto's thyroiditis: a report of three cases

Antonio Costantini [1], Maria Immacolata Pala

Affiliations + expand
PMID: 24351023 DOI: 10.1089/acm.2012.0612


Daily supplementation of euthyroid rats with the pineapple juice produced a significant reduction in the body weight (16.80%) and a significant increase in serum T_3 and T_4 levels61.10 and 22.20%, respectively), compared to normal controls (Table 2). Administration of MMI to rats in drinking water

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Chrysin restores memory deficit in hypothyroidism mice: Behavioral, neurochemical and computational approaches involving the neurotrophinergic system

Vandreza Cardoso Bortolotto [1], Stífani Machado Araujo [2], Franciane Cabral Pinheiro [3], Márcia Rósula Poetini [4], Luana Barreto Meichtry [5], Mariana G Fronza [6], Silvana Peterini Boeira [7], Lucielli Savegnago [8], Marina Prigol [9]

Affiliations + expand

PMID: 34700210 DOI: 10.1016/j.jpsychires.2021.10.018

Abstract

Hypothyroidism is a condition that affects multiple systems, including the central nervous system, causing, for example, cognitive deficits closely related to Alzheimer's disease. The flavonoid chrysin is a natural compound associated with neuronal improvement in several experimental models. Here, we evaluated the effect of chrysin on cognitive impairment in hypothyroid female mice by exploring neuroplasticity. Hypothyroidism was induced by continuous exposure to 0.1% methimazole (MTZ) in drinking water for 31 days. On the 32nd day, the animals showed low plasma levels of thyroid hormones (hypothyroid mice) than the control group (euthyroid mice). Subsequently, mice were intragastrically administered with vehicle or chrysin (20 mg/kg) once a day for 28 consecutive days. At the end of the treatments, behavioral tests were performed: open-field test (OFT) and morris water maze (MWM). Then, the levels of neurotrophins (BDNF and NGF) in the hippocampus and prefrontal cortex were measured and tested the affinity of chrysin with neurotrophinergic receptors through molecular docking. Hypothyroid mice showed memory deficit in the MWM and reduced neurotrophins levels in the hippocampus and prefrontal cortex, meanwhile, the chrysin treatment was able to reversed the deficit of spatial memory function and increased the levels of BDNF in hipocamppus and NGF in both structures. Additionally, molecular docking analysis showed that chrysin potentially binds to the active site of the TrkA, TrkB, and p75NTR receptors. Together, these findings suggest that chrysin reversed behavioral and neurochemical alterations associated with memory deficit induced by hypothyroidism, possibly by modulating synaptic plasticity in the

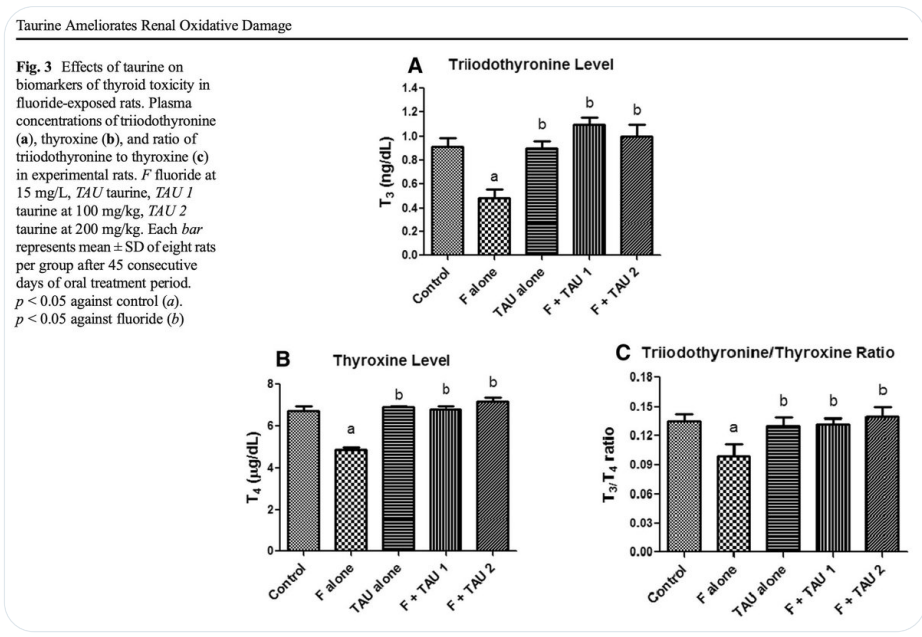

Fig. 3 Effects of taurine on biomarkers of thyroid toxicity in fluoride-exposed rats. Plasma concentrations of triiodothyronine (**a**), thyroxine (**b**), and ratio of triiodothyronine to thyroxine (**c**) in experimental rats. *F* fluoride at 15 mg/L, *TAU* taurine, *TAU 1* taurine at 100 mg/kg, *TAU 2* taurine at 200 mg/kg. Each *bar* represents mean ± SD of eight rats per group after 45 consecutive days of oral treatment period. $p < 0.05$ against control (*a*). $p < 0.05$ against fluoride (*b*)

More studies:
pubmed.ncbi.nlm.nih.gov/6747732/
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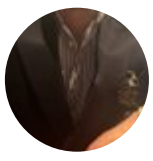

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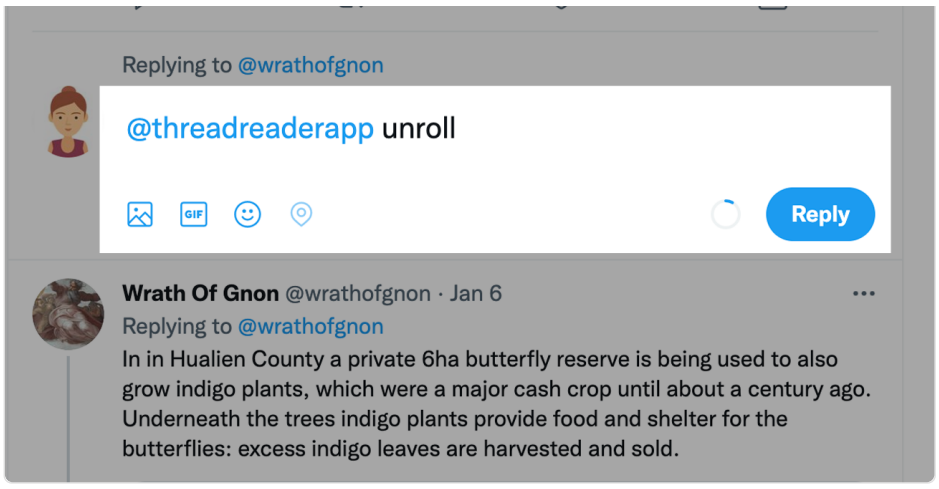

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Oct 31

Every video and blog post about hair loss says the same things. So, here's a summary of the MOST effective strategies you can use to manage premature hair loss and gray hair that don't have dangerous side effects. Master thread🧵 Disclaimer: The sooner you start implementing these once you notice these issues, the better your results will be.

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Oct 30

Gut health masterclass If you are struggling with gut issues such as: -Bloating -Constipation -IBS -Leaky gut -SIBO -SIFO -Candida Here's the ultimate plan for improving them and repairing your gut once and for all. Thread🧵

*Standard disclaimer that nothing in

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Oct 30

Melatonin is what expensive anti-ageing supplements want (and pretend) to be. This 3.5 billion-year-old molecule is the ultimate insurance policy of the human body. It: - Prevents and helps treat hair loss. - Controls mitochondrial oxidative stress (broad-spectrum antioxidant that's 10 times stronger than vitamin C). -Prevents migraines and protects

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Oct 29

Understanding the topic of mitochondria is probably the best thing you can do if you want to improve your health. After all, mitochondrial dysfunction is implicated in a host of health conditions ranging from chronic fatigue, low testosterone, depression, bipolar disorders, low testosterone and neurodegenerative diseases all

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@Helios_Movement

Oct 27

Modern life is quietly sabotaging your immune system. From spike protein pathology, redox collapse and thymic involution that shrink and starve your naive T-cell factory, all the way to heavy metal exposure, nutrient deficiencies, gut dysbiosis and much more, the list of things that harm our immune system is endless. So here's how you can build a resilient immune

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Oct 27

Heart disease is the leading cause of death for both men and women. Yet it still is a neglected topic and most advice surrounding it still emphasizes on old topics that are proven almost irrelevant. Not only that but most people ignore the warning signs of harmed cardiovascular function like fatigue, an out-of-range lipid profile, high blood pressure, erectile

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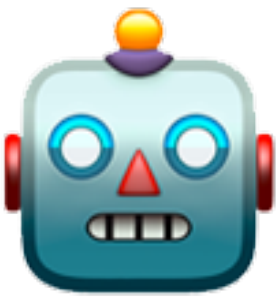

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