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EGCG

(−)-Epigallocatechin-3-gallate · $C_{22}H_{18}O_{11}$ · 458.37 · CAS 989-51-5

What this is. The story of one subject, told in words a person with no science behind them can follow, and the published evidence that story rests on, in four parts: what it is, what it does, the human studies, and the research that cuts against it. Every study used is tagged the same nine ways.

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1 The Story

> **This is a reading.** It is one scientist's account of what this body of published work adds up to. Each claim below carries the rows it rests on. The evidence is in Section 6, The Sources, listed by row.

1 What people take it for

Green tea is typically taken for antioxidants, fat burning, or both.

It is the reason on the label, the reason in the marketing, and the reason most people would give if asked in a shop.

2 Where it actually goes

Very little of the molecule arrives in the blood whole. Most of what is swallowed travels the length of the gut to the large intestine, where bacteria take it apart. The smaller pieces the bacteria make are what cross into the blood and travel around.

So most of what ends up moving around the body is not the green tea molecule itself. It is the pieces made out of it. In urine, those pieces outnumber what is left of the original by a wide margin (Rows 32, 43).

There are no substantial studies in which the whole molecule, on its own, was found absorbed by the body.

So before anything else: for most of its time in a person, this molecule is not in the bloodstream, which is where it would have to be for the antioxidant and fat burning claims to work. It is in the gut, moving along the wall.

3 What was tested in people, and did not hold

Somebody went and measured the antioxidant story in people. There is a switch inside cells, called NRF2, that turns on the cell's own antioxidant defences. In a randomised, double blinded trial in men, it did not turn on. A cleanup enzyme called catalase did not move. Neither did a marker of damage to DNA (Row 17). A second study tested the same idea on skin: four weeks of capsules gave no protection against the redness that follows ultraviolet light. That was a side question in that study, and only a few people were in it (Row 7).

The fat burning turned out to be the caffeine. People sat in a sealed room that measures how much energy the body burns over 24 hours. Green tea catechins plus caffeine raised it. Caffeine on its own raised it about the same amount (Row 23).

The gut bacteria did not change. Twelve weeks of capsules against a placebo, in Caucasian men and women. The authors' own conclusion: "Green tea supplementation for 12 weeks did not have a significant effect on composition of the gut microbiota" (Rows 40, 41, 42).

What did matter was the bacteria a person already had. A separate trial looked at it the other way round: not whether green tea changes your bacteria, but whether the bacteria you start with change what green tea does for you. It did. Men who began with more of one bacterial group got more fat burning out of the supplement. Women did not. Both trials are in Section 3, What It Does (Rows 40, 41, 42).

Three more came back empty, or backwards. A second kind of chemical tag on DNA, called histone acetylation, did not move. It was measured in the same people as the gene result that comes later in this story (Row 21). C-reactive protein, the blood test used for general inflammation, did not move either (Rows 18, 19). And one went the wrong way. COMT is an enzyme that clears

certain signalling chemicals out of the body. The laboratory predicted green tea would slow it down. In people it ran 24% faster instead. This is the one place in the whole file where the human result points the opposite way from the laboratory prediction (Row 20).

The weight trials do not agree with each other. Four of them asked the question one trial at a time. The one that found nothing is also the only one that says how much EGCG was actually in it, and the only one that did not also put people on an exercise programme. The clearest positive results come from a population that another group of researchers decided not to pool with the rest, and from an arm given far more than a cup of tea delivers. Three of the four were run by someone with a commercial interest in the answer (Rows 34, 35, 36, 37).

Read that list on its own and the honest conclusion is that the thing does not do what is claimed for it.

4 Which leaves a question

People have been drinking this for a very long time. There is physical evidence of tea use going back over two thousand years (Row 1).

And one study in this file did not measure a marker at all. It followed people and counted what happened to them. 40,530 adults in Japan, eleven years, 4,209 deaths. The people drinking five or more cups a day died, of any cause, less often than the people drinking less than one: women at 0.77 against 1, men at 0.88. For heart and stroke deaths in women it was 0.69. Cancer deaths were no different at any amount (Row 3).

That is a cohort study. Nobody was assigned to drink tea, people reported their own cups, and it is one country. It shows an association, not a cause. But it is the longest look at real outcomes in this file, and it points the other way from every rule-out above.

> So either all of that time was a mistake, or the studies were looking in the wrong place.

5 The reframe, and where it comes from

The reframe is not a rescue. It is a count.

Section 3, What It Does, lists nine things this molecule was supposed to do, and pairs every one of them with a study in people. Four came back changed. Three of those four happen in the gut or on its wall. The fourth is the molecule being found inside an organ.

The ones that came back empty were nearly all measured somewhere else: in blood cells, in skin, in whole-body calorie burn.

They went looking for it **systemically**, everywhere in the body at once, for a molecule that spends its time **locally**, in one place. They came back empty, which is the right answer to that question.

> *The destination was close the whole time.* It is the wall the molecule was touching on its way down.

6 What did hold, and where

It grabs iron on the way past. The part of the molecule that does this grips iron in the gut before the body can take the iron up, so a meal eaten with tea delivers less iron than the same meal without it. A catechin missing that part did nothing at all, which is how they know it is that part doing the work (Row 10). That is a real effect on a real person, and it happens in the gut.

It changes what gets carried across the gut wall. Some medicines cannot cross the gut wall on their own. A protein carries them across, like a turnstile. Green tea blocks that turnstile, so less of the medicine gets into the blood (Rows 11, 13). This is the one finding in the file measured at a single ordinary cup of brewed tea rather than at a supplement dose. The medicines and the amounts are on the rows in that section.

It reaches an organ. EGCG was found in prostate tissue in most of the men who took it (Row 9). It travelled there in the blood. So some of it does get out of the gut, even though most of it does not.

It turned down a gene instruction in the gut lining. This one needs a little background, so here it is in plain terms.

Your DNA carries small chemical tags that switch genes on and off. As a person gets older, more of those tags land on genes that were working in youth, and those genes go quiet. That going quiet is part of what ageing is, at the level of the genome (Row 44). One enzyme, DNMT1, is the one that keeps putting those tags on (Row 45).

In this trial, volunteers over fifty had a sample of their gut lining taken before and after. After green tea, the cells' instruction for making DNMT1 was lower (Row 21).

What was measured is the instruction, not the enzyme itself. Those two do not always move together, and this trial did not measure the enzyme (Row 45).

This is mechanistic science. It shows a mechanism moving, in human tissue. It is not a trial that measured how long anyone lived, and the trial itself was asking about colorectal cancer risk rather than about ageing (Row 21). Mechanistic evidence and clinical evidence answer different questions and both of them count.

It is the kind of mechanism that could sit underneath the cohort finding above, where the people drinking five or more cups a day died less often. No study in this file tested that link. It is a question worth asking, not an answer.

7 What you are left holding

Here is the point: the cup and the capsule are not the same product, and the evidence splits along that line.

The cup is where the longevity signal is. 40,530 people, eleven years, fewer deaths at five or more cups a day (Row 3). There is no liver injury recorded at brewed infusion doses anywhere in this file.

The capsule is where the harm signal is. The European Union set a limit of under 800 mg EGCG a day in food, with warnings that have to appear on the label, because concentrated extracts have been linked to liver injury. Brewed tea at ordinary strength is excluded from that limit. The United States has set no equivalent (Row 38). That is where Europe drew its line, and it drew it around the concentrated form.

A day of brewed tea delivers a fraction of what the capsule trials used. Most of what held up in testing was measured at capsule doses, and the mechanisms that happen in the gut are the ones most likely to be within reach of a cup.

About those liver cases. In one series, a particular gene variant turned up in most of the people affected. You would only find it with a specialised genetic test, and it does not show up in ordinary blood work. One of the products in that series had no

detectable green tea in it at all. That is worth knowing, because it means some of what gets blamed on green tea may be about what else was in the bottle (Row 30).

People have consumed this at cup doses for a very long time with no harm signal attached at that level. A capsule at a concentration nobody has lived with is a different question, and the answer there is unknown rather than settled.

What is done with this file is yours to decide, together with your own regulatory team. This file gives you the story, the evidence it rests on, and where every piece of it came from.

1.1 The script

This is the story said out loud, which is the form most companies use it in. Two lengths are here and both are yours. Every spoken line is traced below to the section and the source it came from. No gene, no enzyme, no drug and no figure is spoken.

TABLE 1.1 RUNTIME, COUNTED RATHER THAN ESTIMATED

VERSION	SPOKEN WORDS	AT 150 WORDS A MINUTE
Longer	335	2 minutes 14
Short	124	50 seconds

THE LONGER SCRIPT, 2 MINUTES 14

> Green tea. Your customer takes it for the antioxidants. Here is what it is actually doing in there.

> It goes down, and only a little of it crosses into the blood early on. Most of it keeps going, all the way to the large intestine, where trillions of bacteria live. They break it apart, and the smaller pieces they make are what cross and travel around the body.

> And something you have probably never heard before? It spent that whole trip crawling along the wall of the gut.

> Now here is what surprised me. Somebody went and measured the antioxidant story in people. The switch it is supposed to flip did not move. Not in immune cells. Not in skin. And the fat burning? When they measured that, caffeine on its own moved it about the same amount.

> People have been drinking this for thousands of years. So was that whole time a mistake?

> No. We were looking through the wrong lens. The studies went looking for it in the blood, in the skin, in the calorie burn. It was not in those places, so the results came back mixed and the argument became about numbers.

> It was on that wall the whole time.

> The things that held up happen right there. It grabs onto minerals as it goes past. It changes what gets carried across and what does not.

> And they took a piece of that lining and looked at it. This part is accepted genetics. As you get older, genes that were working when you were young get switched off, and that switching off is part of what cellular aging is. There is an enzyme that does it. In that tissue, the cells had turned down the instruction for making it.

> So the destination was never somewhere far away. It is the wall it was touching the entire way down.

> You did not need a degree for any of that. You could say it back to somebody tonight and they would get it.

THE SHORT SCRIPT, 50 SECONDS

> Green tea. Your customer takes it for the antioxidants. Here is what it is actually doing in there.

> Most of it never reaches the blood. It travels the whole way to the large intestine, where bacteria break it apart, and it spends that entire trip crawling along the wall of the gut.

> Somebody measured the antioxidant story in people. The switch it is supposed to flip did not move. The fat burning? Caffeine on its own did about the same.

> We were looking in the wrong place. What held up happens right there, on that wall. It grabs onto minerals as it goes past, and it changes what gets carried across.

> You could say that back to somebody tonight and they would get it.

TABLE 1.2 WHERE EVERY SPOKEN LINE COMES FROM

LINE	WHAT IT RESTS ON
Only a little crosses early. Most keeps going to the large intestine, bacteria break it apart, and the pieces are what cross	Section 3, What It Does. Counting the colonic catabolites rather than the intact molecule, one beverage feeding study calculates bioavailability at 39% (Del Rio 2010, PMID 20080030), and in urine the colonic valerolactones outweigh the flavan-3-ol conjugates by roughly ten times. The fraction absorbed for the intact molecule alone is not measured in humans in any source here, so the script says a little and speaks no figure
The antioxidant switch did not move. Not in immune cells. Not in skin	Section 3, What It Does. Thorley 2023, PMID 37439906, randomised, double blinded, 24 males. NRF2 binding to the antioxidant response element in peripheral blood mononuclear cells did not increase, P = 0.12. Catalase unchanged. Urinary 8-OHdG unchanged. Chow 2003: four weeks at 800 mg a day gave no protection against ultraviolet induced erythema, the functional version of the same test
The fat burning? Caffeine on its own moved it about the same amount	Section 3, What It Does, mechanism summary, thermogenesis. Human endpoint was 24 hour energy expenditure in a respiration chamber. Direction in people: present with catechin plus caffeine and with caffeine alone, at similar magnitude
It grabs onto minerals as it goes past	Section 3, What It Does, mechanism summary, iron chelation by the galloyl group. Human endpoint was iron absorption, with a dose response and a structure control. Direction in people: effect present, dose related
It changes what gets carried across and what does not	Section 3, What It Does, mechanism summary, intestinal OATP1A2 inhibition. Human endpoint was plasma nadolol and systolic blood pressure. Direction in people: effect present. **The script names no drug**, because naming one turns a mechanism into a warning about somebody else's product
The gene line, in full	Hu 2016, PMID 27923410, *Br J Nutr* 2016;116(11):1901-1911. Randomised, 32 volunteers over 50 with low plasma selenium, 11 in the green tea arm, rectal biopsies before and after. Rectal DNMT1 messenger RNA reduced 30% with green tea extract alone, P < 0.05, at 800 mg EGCG a day as capsule extract. Acetylated histone H3 in the same subjects was not significantly affected
Why the line says instruction and not enzyme	What was measured is the messenger RNA, not the enzyme protein. Those two can move independently and this trial did not measure the protein. An earlier draft said there was less of that enzyme. That would have said more than the trial measured, and it is corrected
That genes working in youth get switched off with age, and that this is part of cellular ageing	Ashapkin VV, Kutueva LI, Vanyushin BF. Aging as an Epigenetic Phenomenon. *Curr Genomics*. 2017;18(5):385-407. PMID 29081695. A review of an established pattern, which is why the line says accepted genetics

LINE	WHAT IT RESTS ON
That an enzyme does it	Li L, Mao X, Li LX, et al. Feedback loops between DNMT1 and autophagy as well as senescence promotes organ aging and canities. *Autophagy.* 2026;22(10):2809-2830. PMID 42153573. One recent paper, largely mouse tissue with some human cell work. No enzyme is named on camera, so nothing spoken rests on the weaker source

2 What It Is

TABLE 2.1 IDENTIFICATION

FIELD	VALUE	SOURCE
Name	(−)-epigallocatechin-3-gallate	PubChem CID 65064
Molecular formula	C22H18O11	PubChem CID 65064
Molecular weight	458.37 g/mol	PubChem CID 65064
CAS number	989-51-5	CAS registry
ChEMBL	CHEMBL159	ChEMBL
DrugBank	DB12116	DrugBank
FDA UNII	BQM438CTEL	FDA Global Substance Registration System
InChIKey	WMBWREPUVVBILR-WIYYLYMNSA-N	PubChem CID 65064
Chemical class	Flavan-3-ol (catechin)	Structural classification
Source organism	*Camellia sinensis*	Botanical

A small molecule, not a protein. A protein is taken apart by digestion; a small molecule is not, so what limits it is absorption. Two structural features recur throughout this file: a gallate ester at the C3 position and a trihydroxyl B-ring. Section 3, What It Does records a human study in which the presence or absence of the gallate group determined whether an effect occurred.

Green tea and black tea come from the same plant. Oxidation during black tea processing converts catechins into theaflavins and thearubigins, so the catechin content differs by processing rather than by species.

3 What It Does

What happens to the molecule after it is swallowed, in five steps. Every step cites a register row, and a step that has not been measured in people says so on the step rather than in a paragraph underneath it. The study rows that produce these figures follow below.

TABLE 3.1 WHAT HAPPENS TO THE MOLECULE AFTER IT IS SWALLOWED, IN FIVE STEPS

STEP	WHAT THIS FILE RECORDS	WHERE IT STOPS
Fraction that arrives	Single oral doses of 50 to 1,600 mg gave mean peak plasma concentrations of 130 to 3,392 ng/mL, which at 458.37 g/mol is 0.28 to 7.4 micromolar (Ullmann 2003, PMID 12760312). Counting the colonic catabolites rather than the intact molecule, one beverage feeding study calculates bioavailability at 39% (Del Rio 2010, PMID 20080030), and in that study EGCG was the only unmetabolised compound present in plasma	A fraction absorbed for the intact molecule alone is not measured in humans in any source in this file
What raises or lowers it	Exposure rose more than in proportion to dose, which the authors attribute to saturable presystemic elimination (Chow 2001, PMID 11205489). Four weeks of 800 mg once daily raised the area under the plasma concentration time curve by more than 60%, while 400 mg twice daily did not change it (Chow 2003, PMID 12960117). Both pharmacokinetic studies dosed fasting, which is the condition the European label warning names	Whether a fed dose produces a different exposure is not measured in humans in this file
Where it distributes	EGCG was detected in prostate tissue in 67% of the green tea plus quercetin group and 75% of the green tea plus placebo group, in a trial of 31 men taking 830 mg green tea polyphenols daily for four weeks; the per arm denominators behind those two proportions are not stated in the source (Henning 2020, PMID 32347270). Across plasma, blister fluid and skin biopsies from 11 people who completed, 26, 20 and 7 catechin metabolites were found respectively, and concentration was higher in plasma than in blister fluid in every comparison reported (Clarke 2015, PMID 26454512)	Only two metabolites reached every one of the three sample types, and the authors state their conjugate results are speculative for want of commercial standards
Organ systems reached	Blood, prostate tissue, skin and blister fluid, and rectal mucosa, where DNMT1 messenger RNA fell 30% on 800 mg a day (Hu 2016, PMID 27923410). The liver appears in this file as a site of injury rather than of measured concentration (Yu 2017, PMID 28765194)	Distribution to any compartment beyond those four is not measured in humans in this file, and no source here measures brain, heart or kidney concentration

STEP	WHAT THIS FILE RECORDS	WHERE IT STOPS
How it leaves	Mean terminal half life 1.9 to 4.6 hours across the ascending dose range (Ullmann 2003, PMID 12760312). In urine the dominant catabolites are the colonic valerolactones, averaging roughly ten times the concentration of the flavan-3-ol conjugates (Del Rio 2010, PMID 20080030). Renal clearance of three co-administered drugs was unchanged, so the transporter effect in Section 3, What It Does is not a clearance effect (Misaka 2020, PMID 32320490; Misaka 2021, PMID 33048477)	Biliary excretion and a mass balance are not measured in humans in this file

What the five steps say together. The intact molecule is a minor part of what the body sees. The larger part is a set of bacterial products whose amount differs greatly between people, which the feeding study authors attribute to differences in their own gut bacteria and do not explain further. Neither of the two studies that characterise those products measures a clinical outcome, so this file records what reaches the circulation and does not state what the catabolites do.

The study rows behind the five steps above follow, beginning with the ascending dose study that sets the exposure range.

3.1 What the gut bacteria do with it, and what it does not do to them

, and what it does not do to them

The rows above establish that most of what is swallowed is taken apart by gut bacteria, and that how much comes back differs greatly between people. Two randomised controlled trials asked the next question, and the answer runs against the expectation.

Registered against reported dose. The registration for NCT01556321 states the intervention as a 757 mg capsule containing 84.5 mg EGCG and 2.1 mg caffeine, taken three times daily, which is 253.5 mg EGCG and 6.3 mg caffeine per day. The published report states more than 560 mg EGCG and 280 to 450 mg caffeine per day. This file carries the published figure because that is what the analysis reports, and records the registration figure here so the difference is visible rather than reconciled silently. The same treatment is applied to the Minnesota trial in Section 4, The Human Studies.

What these two rows say together, and what they do not. The direction is the reverse of the common expectation. The trial that set out to see whether green tea changes the gut bacteria found that it did not. The trial that looked the other way round, at whether the bacteria a person already carried predicted what they got out of the supplement, found that it did, and only in the men.

Sorting people by metabolic type in order to predict who responds is written in that review as something that could be done, not as something that has been done.

3.2 The pathways it touches

Seven pathways, each one named, marked with the kind of evidence it stands on, linked to its register rows, and carried to a sentence a reader with no training can restate. The laboratory claim and the human study that tested it follow each block, in the same format and at the same size.

TABLE 3.2 MECHANISM SUMMARY. EVERY CLAIM ANSWERED WITH A HUMAN STUDY

MECHANISM CLAIM	HUMAN ENDPOINT MEASURED	DIRECTION IN PEOPLE
Iron chelation by galloyl group	Iron absorption, dose response, structure control	Effect present, dose related
Intestinal OATP1A2 inhibition	Plasma nadolol and systolic blood pressure	Effect present
Delivery to solid tissue	EGCG in prostate tissue	Detected in most participants

MECHANISM CLAIM	HUMAN ENDPOINT MEASURED	DIRECTION IN PEOPLE
DNMT1 suppression	Rectal DNMT1 mRNA, 800 mg/day, n = 11 in arm	Reduced
Thermogenesis	24 hour energy expenditure, respiration chamber	Present with catechin plus caffeine and with caffeine alone, at similar magnitude
Histone acetylation	Rectal acetylated histone H3, same subjects	Not changed
NLRP3 and inflammation	CRP across 27 trial arms; TNF-α; IL-6	CRP not changed; TNF-α reduced; IL-6 increased
Nrf2 activation	NRF2/ARE binding in PBMCs; catalase; 8-OHdG; UV erythema	Not changed
COMT inhibition	Red blood cell COMT activity at 750 mg	Activity increased 24%

About the mark that reads Held by the publisher. Some of the papers behind this file sit behind a journal paywall. Where a field on a study row depends on material a publisher sells, the field carries that mark instead of the detail, because we do not reproduce what a publisher sells. Thirty five fields across nineteen rows carry it. It appears in this demonstration file because the file was built from publicly readable sources only. In a file built for a client, those fields are obtained and filled in.

TABLE 3.3 THE STUDIES BEHIND THIS SECTION

SOURCE	SAMPLE AND POPULATION	DOSE AND FORM	WHAT IT FOUND	WHAT IT DID NOT FIND
Ullmann et al. 2003 *J Int Med Res* 2003;31(2):88-101. PMID 12760312	60 healthy male volunteers, 10 per dose group Male only. Age range not stated in the abstract. Single centre	Single oral doses of 50, 100, 200, 400, 800 or 1,600 mg, fasting Isolated crystalline EGCG. This is purer than most commercial extracts	Mean Cmax 130 to 3,392 ng/mL across the dose range. At 458.37 g/mol that is 0.28 to 7.4 micromolar. Mean Tmax 1.3 to 2.2 hours. Mean terminal half life 1.9 to 4.6 hours. Mean AUC to infinity 442 to 10,368 ng·h/mL. Single doses up to 1,600 mg "were safe and very well tolerated"	No tissue concentrations measured. No repeat dosing. No female subjects. No clinical endpoint
Type. Clinical pharmacokinetics **Human trial.** Yes **Substance tested.** 94% pure crystalline bulk EGCG **Blinding.** Double blind **Control.** Placebo, 2 of every 10 subjects **Funding. No funding statement exists in the published article.** The clinical work was conducted by PAREXEL-CEMAF, Clinical Department, Poitiers, France, a contract research organisation, with research direction from Roche Vitamins Ltd, Human Nutrition and Health, Basel, a commercial nutritional ingredient business. That arrangement is visible only from the affiliations and the methods, and is not declared as a sponsorship anywhere in the paper				
Chow et al. 2001 *Cancer Epidemiol Biomarkers Prev* 2001;10(1):53-8. PMID 11205489	20 healthy subjects, 5 per dose level. 16 women and 4 men. Mean ages by group ranged 44.6 ± 9.0 to 49.2 ± 11.6 years Male and female. Single centre	Single oral 200, 400, 600 or 800 mg based on EGCG content Isolated EGCG against a decaffeinated catechin mixture	Mean Cmax was 73.7, 111.8, 169.1 and 438.5 ng/mL for EGCG at 200, 400, 600 and 800 mg, and 72.7, 125.3, 165.7 and 377.6 ng/mL for Polyphenon E at the same levels. Mean AUC of unchanged EGCG 22.5, 35.4, 101.9 and 167.1 min·µg/mL at 200, 400, 600 and 800 mg. Exposure rose more than in proportion to dose, which the authors attribute to saturable presystemic elimination. Epigallocatechin and epicatechin were present "predominantly in conjugated forms" after Polyphenon E	No significant difference in EGCG pharmacokinetics between the two formulations. Epigallocatechin and epicatechin were not detected in plasma after EGCG administration
Type. Clinical pharmacokinetics **Human trial.** Yes **Substance tested.** EGCG, and Polyphenon E, a decaffeinated green tea catechin mixture **Blinding.** No blinding is described in the published methods **Control.** Crossover between the two formulations at the same dose level **Funding.** "Supported by Contract N01-CN-85179 from the National Cancer Institute." Bulk EGCG and Polyphenon E were supplied to the NCI Chemoprevention Agent Development Research Group by Food Research Laboratories, Mitsui Norin Co., Ltd., Fujieda City, Japan				

SOURCE	SAMPLE AND POPULATION	DOSE AND FORM	WHAT IT FOUND	WHAT IT DID NOT FIND
Chow et al. 2003 *Clin Cancer Res* 2003;9(9):3312-9. PMID 12960117	40 healthy participants, 14 men and 26 women, 8 per arm across 5 arms Fitzpatrick skin type II or III. Both sexes	800 mg once daily, or 400 mg twice daily, as EGCG or as Polyphenon E, for 4 weeks after a 2 week run in Capsule, isolated EGCG against decaffeinated mixture	Greater than 60% increase in the area under the plasma EGCG concentration time curve after 4 weeks at 800 mg once daily. Adverse events reported were rated mild and for most events the incidence in treated groups was not more than in the placebo group. The authors' own stated conclusion is that it is safe for healthy individuals to take these products at amounts equivalent to the EGCG in 8 to 16 cups of green tea for 4 weeks	No significant change in pharmacokinetics at 400 mg twice daily. No significant changes in blood counts or blood chemistry profiles. "Four weeks of green tea polyphenol treatment at the selected dose and dosing schedule did not provide protection against UV-induced erythema"
Type. Clinical pharmacokinetics and safety **Human trial.** Yes **Substance tested.** EGCG, and Polyphenon E **Blinding.** The evaluator assessing ultraviolet induced erythema was blinded to treatment assignment. Blinding of participants is not explicitly described **Control.** Placebo arm **Funding.** "Supported by a contract (N01-CN-85179) from the National Cancer Institute." EGCG, Polyphenon E and placebo capsules were supplied by the NCI Chemoprevention Agent Development Research Group				
Henning et al. 2020, tissue delivery *Food Funct* 2020;11(5):4114-4122. PMID 32347270	31 men with prostate cancer scheduled for prostatectomy. Per arm denominators not stated in the abstract HELD BY THE PUBLISHER Male, with prostate cancer. Single centre	830 mg green tea polyphenols daily for 4 weeks before surgery Capsule extract	EGCG detected in prostate tissue in 67% of the green tea plus quercetin group and 75% of the green tea plus placebo group. Epicatechin gallate detected in 93% and 94% respectively. Quercetin was raised 14 fold in plasma, 12 fold in urine and 4.5 fold in prostate tissue in the quercetin arm. No liver toxicity was observed	No significant difference between the two groups in green tea polyphenol content or methylation activity in prostate tissue or red blood cells. Because both arms received green tea, this comparison does not test green tea against no green tea
Type. Clinical pharmacokinetics in tissue **Human trial.** Yes **Substance tested.** Green tea extract, 1 g providing 830 mg green tea polyphenols, with or without 800 mg quercetin **Blinding.** Placebo controlled, parallel design; the comparator was quercetin against placebo, both arms receiving green tea **Control.** Green tea plus placebo arm **Funding.** Not stated in the record retrieved HELD BY THE PUBLISHER				
Del Rio et al. 2010 *Nutrition* 2010;26(11-12):1110-6. PMID 20080030. doi 10.1016/j.nut.2009.09.021	20 healthy volunteers Healthy adults. Sex distribution not stated in the abstract HELD BY THE PUBLISHER	Approximately 400 micromoles of flavan-3-ols in a single 400 mL serving, which is the beverage range rather than a capsule Ready to drink beverage	39 catabolites identified in plasma and urine. "Colonic microflora-derived polyhydroxyphenyl-γ-valerolactones were by far the main urinary catabolites, averaging 10 times greater concentration than flavan-3-ol conjugates." Counting those colonic products, the authors calculate bioavailability at 39%, against the low single figures usually quoted for the intact molecule. In plasma, EGCG was the only unmetabolised compound present	The study does not measure any clinical outcome, and it does not establish that any catabolite does anything. The authors record "great variability in urinary excretion of colonic metabolites among participants, probably related to differences in their own colonic microflora," and do not explain that variability
Type. Clinical pharmacokinetics, metabolite identification **Human trial.** Yes. Feeding study **Substance tested.** Ready to drink green tea, 400 mL containing approximately 400 micromoles of flavan-3-ols **Blinding.** Not stated in the abstract HELD BY THE PUBLISHER **Control.** Each participant's own baseline, with urine collected for 24 hours and plasma for 4 **Funding.** Not established. Article is subscription gated HELD BY THE PUBLISHER				
Clarke et al. 2015 *J Nutr Biochem* 2015;27:203-10. PMID 26454512. doi 10.1016/j.jnutbio.2015.09.001	12 recruited, 11 completed. 6 men and 5 women, median age 21, range 18 to 58 Healthy, skin type I or II, BMI under 35. Single centre, Manchester	1,080 mg total green tea catechins daily for 12 weeks, described by the authors as the equivalent of 5 cups of green tea Gelatine capsule, 450 mg green tea per capsule	26 catechin metabolites in plasma, 20 in blister fluid and 7 in skin biopsies. Among them the valerolactones M4 and M6, which the authors state derive from microbial metabolism of the catechins in the gut. Three valerolactone conjugates appeared in plasma at 3 months that were absent at day 0. Concentration was higher in plasma than in blister fluid in every comparison reported	Only two metabolites reached all three sample types. The authors name their main limitation themselves: no commercial standards exist for the conjugates, "and therefore, the results obtained are speculative." No clinical outcome was measured
Type. Clinical, metabolite distribution into tissue **Human trial.** Yes. Open oral intervention over 3 months **Substance tested.** Green tea catechin capsules, 1,080 mg total catechins per day, with 100 mg vitamin C **Blinding.** Open label. No blinding, and none is claimed **Control.** Each participant's own presupplementation baseline, and unexposed skin against exposed **Funding.** Research Support, Non-U.S. Gov't, per PubMed indexing. Ethics: North Manchester Research Ethics Committee reference 08/H1006/79				

SOURCE	SAMPLE AND POPULATION	DOSE AND FORM	WHAT IT FOUND	WHAT IT DID NOT FIND
Janssens et al. 2016 *PLoS One* 2016;11(4):e0153134. PMID 27054321. doi 10.1371/journal.pone.0153134	58 participants analysed, 30 in the green tea arm and 28 in the placebo arm. The trial registration records 70 enrolled Caucasian men and women, with normal weight and overweight participants compared. Single centre, Maastricht. Habitual tea drinkers were excluded at entry by protocol	More than 560 mg EGCG per day for 12 weeks, as the published report states it. That sits above the 90 to 300 mg habitual infusion range in the reference table and below the 843 mg capsule dose that produced the liver signal Capsule. Not brewed tea and not an aqueous infusion	Authors' own conclusion: "Green tea supplementation for 12 weeks did not have a significant effect on composition of the gut microbiota." Bacterial diversity and community structure were similar between arms. Separately, and independent of treatment, overweight participants had lower bacterial alpha diversity than normal weight participants at baseline, P = 0.002	No significant change between baseline and week 12 in either arm, and no significant treatment by time interaction, for gut microbial diversity or for body composition
Most et al. 2017 *Eur J Clin Nutr* 2017;71(9):1040-1045. PMID 28589947. doi 10.1038/ejcn.2017.89	37 participants, 18 men and 19 women Overweight and obese men and women, mean age 37.8 ± 1.6 years, mean BMI 29.6 ± 0.5 kg/m². Single centre, Maastricht	282 mg EGCG per day with 80 mg resveratrol, for 12 weeks. That sits at the upper end of the 90 to 300 mg habitual infusion range in the reference table and well below the European ceiling of under 800 mg Capsule, given together with a second polyphenol. This is not isolated EGCG and the design does not separate the two	Authors' own words: "Baseline Bacteroidetes abundance was predictive for the EGCG+RES-induced increase in fat oxidation in men but not in women." Supplementation decreased Bacteroidetes and tended to reduce Faecalibacterium prausnitzii in men, P = 0.05 and P = 0.10	Neither measure changed in women, P = 0.15 and P = 0.77. Other bacterial genera and species were not affected by supplementation. The design does not separate EGCG from resveratrol, and the paper reports no outcome for EGCG alone
Long, Clement and Halliwell 2000 *Biochem Biophys Res Commun* 2000;273(1):50-3. PMID 10873562	Not applicable. Three media tested: Dulbecco's modified Eagle medium, McCoy's 5A and RPMI 1640 Not applicable. No human participants. The subject of the experiment is cell culture medium	1 mM, which is 1,000 micromolar Compound added directly to medium	"Dulbecco's modified Eagle medium gives the highest H(2)O(2) level for all the compounds tested, with levels reaching >400 microM within 2 h for addition of 1 mM concentrations of gallic acid, epigallocatechin gallate, and epigallocatechin." McCoy's 5A and RPMI 1640 also promoted production. The authors state this "could account for some or all of the reported effects of phenolic compounds on cells in culture"	The paper does not establish that every cell result is an artifact, and does not test concentrations in the micromolar range
Brune, Rossander and Hallberg 1989 *Eur J Clin Nutr* 1989;43(8):547-57. PMID 2598894	Adult men and women. Number not stated in the abstract HELD BY THE PUBLISHER	Tannic acid at 5, 25 and 100 mg. This is tannic acid rather than EGCG, and the amounts sit well below the 300 to 1,315 mg range of commercial green tea products Test meal additions and beverages	Inhibition of iron absorption was dose related: 5 mg tannic acid inhibited by 20%, 25 mg by 67%, 100 mg by 88%. Gallic acid inhibited to the same extent as tannic acid per mole of galloyl groups. Tea inhibited iron absorption in proportion to its content of galloyl groups	"No inhibition was observed when catechin was added to the test meal." Catechin lacks a galloyl group. Condensed tannins did not interfere with iron absorption

Type. Clinical, gut microbiota composition endpoint **Design.** Randomised, placebo controlled, parallel, 12 weeks. Registry ClinicalTrials.gov NCT01556321 **Human trial.** Yes **Substance tested.** Green tea capsules delivering more than 560 mg EGCG per day with 280 to 450 mg caffeine, against placebo capsules **Blinding.** Randomised, placebo controlled **Control.** Placebo capsules **Funding.** The trial registration records the sponsor as Maastricht University Medical Center, with no collaborators listed. The article's own funding statement was not retrieved

Type. Clinical, gut microbiota composition and substrate metabolism **Design.** Randomised, double blind, placebo controlled, 12 weeks **Human trial.** Yes **Substance tested.** Epigallocatechin-3-gallate together with resveratrol, 282 mg plus 80 mg per day, against placebo **Blinding.** Randomised, double blind **Control.** Placebo **Funding.** Not established. Article is subscription gated HELD BY THE PUBLISHER

Type. Methodological, laboratory **Human trial.** No. Chemistry of culture media **Substance tested.** EGCG, epigallocatechin, catechin, quercetin and gallic acid, each added to cell culture media **Blinding.** Not applicable. Chemical measurement, no allocation to blind **Control.** Not stated in the record retrieved. The comparison reported is across five compounds and three media HELD BY THE PUBLISHER **Funding.** Not established. Article is subscription gated. NLM indexes non United States government support. Authors at National University of Singapore HELD BY THE PUBLISHER

SOURCE	SAMPLE AND POPULATION	DOSE AND FORM	WHAT IT FOUND	WHAT IT DID NOT FIND
Type. Clinical, mechanistic endpoint **Human trial.** Yes. Iron absorption measured by extrinsic tag method **Substance tested.** Gallic acid, tannic acid, catechin, chlorogenic acid, and tea, each separately **Blinding.** Not stated HELD BY THE PUBLISHER **Control.** Comparison across phenolic structures within the same method **Funding.** Research Support, Non-U.S. Gov't, per PubMed indexing HELD BY THE PUBLISHER				
Misaka et al. 2014 *Clin Pharmacol Ther* 2014;95(4):432-8. PMID 24419562	10 healthy volunteers Healthy adults. Sex distribution not stated in the abstract. Single centre HELD BY THE PUBLISHER	700 mL green tea per day for 14 days, then a single 30 mg oral dose of nadolol with green tea or water Brewed beverage, not extract	Nadolol Cmax decreased by 85.3% and AUC 0 to 48 by 85.0%, both P < 0.01. "The effects of nadolol on systolic blood pressure were significantly reduced by green tea." Nadolol was shown to be an OATP1A2 substrate (Km 84.3 µmol/L) and green tea inhibited OATP1A2 mediated uptake (IC50 1.36%)	Renal clearance of nadolol was not altered. Nadolol was not a substrate of OATP2B1
Type. Clinical, drug interaction **Human trial.** Yes **Substance tested.** Green tea as a beverage, 700 mL/day. Catechin concentrations in the tea and in plasma were measured **Blinding.** Not stated. Crossover design HELD BY THE PUBLISHER **Control.** Water **Funding.** Research Support, Non-U.S. Gov't, per PubMed indexing HELD BY THE PUBLISHER				
Thorley et al. 2023 *Eur J Appl Physiol* 2023;124(1):245-256. PMID 37439906	24 males, 12 per arm. Mean age 23 years Male only. Single site	500 mg/day for 6 days, followed by 100 drop jumps as an oxidative challenge Supplement, green tea polyphenol preparation	Glutathione reductase activity rose 30% in response to exercise (P = 0.01)	NRF2 binding to the antioxidant response element in peripheral blood mononuclear cells did not increase (P = 0.12). Catalase activity did not change (P = 0.12). Urinary 8-hydroxy-2'-deoxyguanosine excretion did not change (P = 0.42). Glutathione reductase did not differ between supplement groups (P = 0.51). Authors' conclusion: "Eccentric exercise, either performed alone or in conjunction with green tea supplementation, did not significantly increase NRF2 activity in PBMCs"
Type. Clinical, mechanistic endpoint measured directly **Human trial.** Yes **Substance tested.** Green tea (poly)phenols, 500 mg/day, against inulin placebo **Blinding.** Double blinded **Control.** Inulin placebo **Funding.** "This study received no funding." Supplement manufactured by Taiyo Kagaku, a commercial green tea ingredient supplier; inulin placebo by Blackburn Distributions. Conducted at Loughborough University, ethics approval by its Research Ethics Committee, pre-registered at osf.io/kz37g before data collection **Competing interests.** "The authors declare no conflict of interest"				
Serban et al. 2015 *Nutrition* 2015;31(9):1061-71. PMID 26233863	11 randomised trial arms Includes both healthy subjects and subjects with cardiometabolic disease, analysed separately	Subgroups analysed at under 400 mg/day total catechins and at 400 mg/day or more Varies by included trial	The null result was robust in sensitivity analysis, and omission of each individual study did not change it	No significant effect on plasma C reactive protein: weighted mean difference 0.085 mg/L (95% CI −0.225 to 0.395), P = 0.592. Null in every subgroup: under 8 weeks P = 0.828; 8 weeks or more P = 0.766; under 400 mg/day P = 0.658; 400 mg/day or more P = 0.247; healthy subjects P = 0.769; cardiometabolic disease P = 0.636
Type. Clinical, biomarker endpoint **Human trial.** Yes. Meta analysis of randomised controlled trials **Substance tested.** Green tea catechins, preparation varying by included trial **Blinding.** Varies by included trial **Control.** Placebo in included trials **Funding.** Not stated in the record retrieved HELD BY THE PUBLISHER				
Haghighatdoost and Hariri 2019 *Phytother Res* 2019;33(9):2274-2287. PMID 31309655	16 articles in the meta analysis, 17 in the systematic review Adults	Varies by included trial Varies by included trial	Green tea "significantly decreased TNF-α levels" and "significantly increased IL-6"	Green tea "could not significantly decrease serum CRP levels." The authors note the effect may differ in populations with high baseline inflammation, which their included trials largely did not have
Type. Clinical, biomarker endpoint **Human trial.** Yes. Meta analysis of randomised clinical trials **Substance tested.** Green tea, preparation varying by included trial **Blinding.** Varies by included trial **Control.** Varies by included trial **Funding.** Not stated in the record retrieved HELD BY THE PUBLISHER				

SOURCE	SAMPLE AND POPULATION	DOSE AND FORM	WHAT IT FOUND	WHAT IT DID NOT FIND
Lorenz et al. 2014 *Eur J Pharmacol* 2014;740:645-51. PMID 24972245	24 healthy volunteers, 14 women and 10 men Healthy adults, genotyped at four functional COMT single nucleotide polymorphisms	750 mg EGCG, single administration, enzyme activity measured at baseline and 2 hours Supplement	Plasma EGCG levels rose significantly after intervention, confirming exposure. COMT activity was "significantly increased by 24% after EGCG consumption." Homozygous Val to Met substitution at rs4680 was associated with significantly decreased COMT activity, independent of EGCG	"Ingestion of 750 mg EGCG did not result in impairment of COMT activity." Plasma EGCG levels were not influenced by any of the COMT polymorphisms. Authors' conclusion: EGCG "may not interfere with COMT-mediated metabolism and elimination of exogenous and endogenous COMT substrates"
Type. Clinical, enzyme activity endpoint **Human trial.** Yes **Substance tested.** EGCG, single 750 mg dose **Blinding.** Not stated HELD BY THE PUBLISHER **Control.** Within subject, before and after **Funding.** Research Support, Non-U.S. Gov't, per PubMed indexing HELD BY THE PUBLISHER				
Hu et al. 2016 *Br J Nutr* 2016;116(11):1901-1911. PMID 27923410	32 volunteers over 50 years of age with plasma selenium at or below 1.36 µmol/L. 9 assigned to Brazil nuts, 11 to green tea extract, 12 to the combination Adults over 50, both sexes, South Australia	800 mg EGCG per day from 4 capsules Capsule extract	Rectal DNMT1 mRNA was reduced by 30% with green tea extract alone and 35% in the combination arm, P < 0.05. NF-κB mRNA was also significantly reduced. Brazil nuts alone produced no significant DNMT1 change	Rectal acetylated histone H3 was not significantly affected. Ki-67 protein expression was not significantly affected. Plasma C reactive protein was not significantly affected. The combination did not differ from what either agent alone would produce
Type. Clinical, tissue biomarker endpoint. Rectal biopsies taken before and after **Human trial.** Yes. Randomised **Substance tested.** Green tea extract capsules providing 800 mg EGCG per day; Brazil nuts as a selenium source; and the combination **Blinding.** Open label for participants, since a Brazil nut intervention cannot be blinded. All data curation, checking, measurement and analysis were conducted by researchers blinded to allocation. Randomisation was by computer generated sequence with allocation concealed in sealed envelopes **Control.** Comparison between the three arms; each subject sampled before and after **Funding.** "This study was supported by the National Health and Medical Research Council of Australia (project grant no. 1007501) and Cancer Council of South Australia." Acknowledgements thank "Dr Leonid Ber and Now Foods, USA, for providing GTE capsules and for their support." Now Foods is a commercial supplement manufacturer **Competing interests.** "The authors declare that there are no conflicts of interest"				
Hoffmann et al. 2023, DIRECT PLUS *Metabolism* 2023;145:155594. PMID 37236302	260 participants, baseline mean BMI 31.2 kg/m² Adults with elevated BMI. Three arms: dietary guidelines, Mediterranean with walnuts (440 mg polyphenols), green Mediterranean (1,240 mg polyphenols)	1,240 mg total polyphenols per day for 18 months. The green tea contribution alone is not separated Whole diet, beverage and food	1,573 differentially methylated regions at FDR under 5% in the green Mediterranean arm, against 177 compared with the Mediterranean arm and 377 compared with dietary guidelines. 1,753 differentially expressed genes at FDR under 5%	The design does not separate the contribution of green tea from walnuts or Mankai, so the methylome change cannot be attributed to green tea
Type. Clinical, methylome and transcriptome endpoint **Human trial.** Yes. Randomised controlled trial **Substance tested.** A green Mediterranean diet supplying 1,240 mg polyphenols per day from walnuts, green tea and Mankai duckweed. Green tea is one of three added components **Blinding.** Not stated in the abstract HELD BY THE PUBLISHER **Control.** Two comparator diet arms **Funding.** Not stated in the record retrieved HELD BY THE PUBLISHER				
Hursel et al. 2011 *Obes Rev* 2011;12(7):e573-81. PMID 21366839	6 articles, 18 conditions Adults. BMI examined as a moderator	Dose response examined per mg administered, pooled across trials. The analysis reports a response per milligram rather than one dose, so this row cannot be placed against the commercial range as a single figure Catechin rich teas and supplements, with and without caffeine	24 hour energy expenditure rose 428.0 kJ (4.7%), P < 0.001, with catechin plus caffeine mixtures, and 429.1 kJ (4.8%), P < 0.001, with caffeine only. 24 hour fat oxidation rose 12.2 g (16.0%), P < 0.02, with the mixture. Dose response: 0.53 kJ per mg for the mixture and 0.44 kJ per mg for caffeine only	Fat oxidation with caffeine only did not reach significance: 9.5 g (12.4%), P = 0.11. The energy expenditure figures for mixture and caffeine only did not differ materially from each other
Type. Clinical, 24 hour metabolic endpoint measured by respiration chamber **Human trial.** Yes. Meta analysis of respiration chamber studies **Substance tested.** Catechin plus caffeine mixtures, and caffeine only, each against placebo **Blinding.** Varies by included study **Control.** Placebo conditions **Funding.** Not stated in the record retrieved HELD BY THE PUBLISHER				

4 The Human Studies

The pooled analyses above do not publish a subgroup at the dose a habitual tea drinker reaches. Individual trials do ask it, and the four that do are below.

TABLE 4.1 THE STUDIES BEHIND THIS SECTION

SOURCE	SAMPLE AND POPULATION	DOSE AND FORM	WHAT IT FOUND	WHAT IT DID NOT FIND
Kuriyama et al. 2006, the Ohsaki cohort *JAMA* 2006;296(10):1255-65. PMID 16968850	40,530 Japanese adults aged 40 to 79 without prior stroke, coronary heart disease or cancer Single country, Japan. Both sexes. Follow up 86.1% of the 40,530 at 11 years	Self reported cups per day. Categories: under 1, 1 to 2, 3 to 4, 5 or more Brewed beverage	All cause mortality, 5 or more cups per day against under 1: women HR 0.77 (95% CI 0.67 to 0.89), men HR 0.88 (95% CI 0.79 to 0.98). Cardiovascular mortality in women HR 0.69 (95% CI 0.53 to 0.90), strongest for stroke. 4,209 deaths over 11 years	"The hazard ratios of cancer mortality were not significantly different from 1.00 in all green tea categories compared with the lowest-consumption category." 1,134 cancer deaths over 7 years
Type. Clinical outcome, observational **Human trial.** No. Prospective population cohort **Substance tested.** Green tea as a beverage, by self reported consumption frequency **Blinding.** Not applicable **Control.** Lowest consumption category as reference **Funding.** Research Support, Non-U.S. Gov't, per PubMed indexing HELD BY THE PUBLISHER				
Filippini et al. 2020, Cochrane review *Cochrane Database Syst Rev* 2020;3:CD005004. PMID 32118296	1,795 participants in the randomised trials. Over 1,100,000 participants across 46 cohort and 85 case control studies Majority of included studies conducted in Asian populations with high green tea intake, which the authors state limits generalisability	Varies by included study Varies by included study	Overall cancer incidence, highest against lowest intake, summary RR 0.83 (95% CI 0.65 to 1.07), 3 studies, 52,479 participants, low certainty. Adverse effects were reported, including gastrointestinal disorders, elevation of liver enzymes, and more rarely insomnia, raised blood pressure and skin reactions. A slight improvement in quality of life against placebo in 3 experimental studies	Cancer related mortality summary RR 0.99 (95% CI 0.91 to 1.07), 8 studies, 504,366 participants, low certainty. For oesophageal, prostate and urinary tract cancer and leukaemia the results were "strongly conflicting", showing increased RR in cohort studies and decreased RR or no difference in case control studies. Authors' conclusion: results "inconsistent, thus providing limited evidence for the beneficial effect of green tea consumption on the overall risk of cancer or on specific cancer sites"
Type. Clinical outcome, systematic review **Human trial.** Both. 11 randomised trials and 131 non experimental studies **Substance tested.** Green tea, beverage and extract, varying by included study **Blinding.** Varies by included study. The 11 experimental studies were assessed as overall high methodological quality **Control.** Placebo in the randomised trials; lowest intake category in the observational studies **Funding.** Research Support, Non-U.S. Gov't, per PubMed indexing HELD BY THE PUBLISHER				
Jurgens et al. 2012, Cochrane review *Cochrane Database Syst Rev* 2012;12:CD008650. PMID 23235664	18 studies per the review record: 15 weight loss trials and 3 weight maintenance trials, 1,945 participants. Pooled subsets reported in the abstract: 6 studies outside Japan with 532 participants, 8 studies in Japan with 1,030 participants, 2 maintenance studies with 184 participants Overweight or obese adults. Heterogeneity required separating studies conducted in Japan from those conducted elsewhere	Varies by included trial Varies by included trial	Studies conducted in Japan were not similar enough to pool; weight change ranged from −0.2 kg to −3.5 kg across those 8 studies, 1,030 participants. In 8 studies recording adverse events, 4 reported events that were mild to moderate, with 2 exceptions in the green tea preparation group requiring hospitalisation, reported as not associated with the intervention	Outside Japan, pooled mean difference in weight loss −0.04 kg (95% CI −0.5 to 0.4), P = 0.88, I^2 = 18%, 532 participants. BMI −0.2 kg/m² (95% CI −0.5 to 0.1), P = 0.21, 222 participants. Waist circumference −0.2 cm (95% CI −1.4 to 0.9), P = 0.70, 404 participants. Waist to hip ratio 0 (95% CI −0.02 to 0.01), 144 participants. Authors' conclusion: the weight loss is "small, statistically non-significant" and "because the amount of weight loss is small, it is not likely to be clinically important." No significant effect on maintenance of weight loss. No studies reported patient satisfaction, morbidity or cost
Type. Clinical outcome **Human trial.** Yes. Systematic review of randomised controlled trials **Substance tested.** Green tea preparations, beverage and extract, varying by included trial **Blinding.** Varies by included trial **Control.** Placebo or control preparation **Funding.** Research Support, Non-U.S. Gov't, per PubMed indexing HELD BY THE PUBLISHER				

SOURCE	SAMPLE AND POPULATION	DOSE AND FORM	WHAT IT FOUND	WHAT IT DID NOT FIND
Baladia et al. 2014 *Nutr Hosp* 2014;29(3):479-90. PMID 24558988. Published in Spanish	154 studies retrieved, 5 included in the quantitative analysis. Weight n = 301, fat mass n = 260, BMI n = 162, waist n = 301, hip n = 210 Healthy adults 18 years or older, BMI 25 to 40 kg/m², both sexes. Asian and Caucasian subgroups analysed separately	Varies by included trial Green tea or extract	Fat mass percentage, overall effect, mean difference −0.76 (95% CI −1.44 to −0.09), P = 0.03, I^2 = 0%, n = 260. The authors state this "was not clinically relevant"	Weight, whole sample, mean difference −0.78 kg (95% CI −2.31 to 0.75), P = 0.32, n = 301. BMI −0.31 (95% CI −0.88 to 0.27), P = 0.30, n = 162. Waist circumference 0.08 cm (95% CI −0.39 to 0.55), P = 0.73. Hip circumference not significant, n = 210. Fat mass was not significant within either the Asian subgroup (P = 0.08, n = 169) or the Caucasian subgroup (P = 0.31, n = 93)
Type. Clinical outcome **Human trial.** Yes. Systematic review and meta analysis of randomised, double blind, parallel group trials **Substance tested.** Green tea or its extracts, containing caffeine and catechins **Blinding.** Double blind, required for inclusion **Control.** Placebo, required for inclusion **Funding.** No funding statement and no conflict of interest statement appear anywhere in the published article, which is itself recorded as a finding. Authors affiliated with GREP-AEDN, the review and position group of the Spanish dietitians and nutritionists association				
Haghighatdoost et al. 2017 *Nutrition* 2017;45:17-23. PMID 29129232	11 randomised controlled trials Human adults. Subgroups by sex, duration and Asian against non Asian	Varies by included trial Green tea and green tea extract	An increase in leptin in studies lasting more than 12 weeks, and an increase in ghrelin in women and in non Asians, on subgroup analysis	No significant effect on leptin overall: weighted mean difference 1.28 ng/mL (95% CI −0.49 to 3.05), P = 0.156. No significant effect on ghrelin overall: 21.49 pg/mL (95% CI −40.86 to 83.84), P = 0.499
Type. Clinical, hormone endpoint **Human trial.** Yes. Systematic review and meta analysis of randomised controlled trials **Substance tested.** Green tea and green tea extract **Blinding.** Varies by included trial **Control.** Placebo **Funding.** Not stated in the record retrieved HELD BY THE PUBLISHER				
Khalesi et al. 2014 *Eur J Nutr* 2014;53(6):1299-311. PMID 24861099	13 studies, published 1995 to 2013 Adults. Subgroup analysed by baseline systolic blood pressure at or above 130 mmHg	Varies by included trial Beverage and extract. A subgroup analysis compared the two and found a greater reduction in both systolic and diastolic blood pressure in the trials using an extract	Systolic blood pressure −2.08 mmHg (95% CI −3.06 to −1.05). Diastolic −1.71 mmHg (95% CI −2.86 to −0.56). Total cholesterol −0.15 mmol/L (95% CI −0.27 to −0.02). LDL cholesterol −0.16 mmol/L (95% CI −0.22 to −0.09). Greater blood pressure reduction in participants with baseline systolic at or above 130 mmHg, and in studies using extract	Changes in blood glucose and body mass index did not reach statistical significance. The review does not report a subgroup at the 90 to 300 mg a day of habitual tea drinking
Type. Clinical outcome **Human trial.** Yes. Systematic review and meta analysis of randomised controlled trials **Substance tested.** Green tea and green tea catechins, beverage and extract **Blinding.** Varies by included trial **Control.** Control preparation **Funding.** No funding statement appears in the published article **Competing interests.** "On behalf of all authors, the corresponding author states that there is no conflict of interest"				
Samavat et al. 2016, Minnesota Green Tea Trial lipid endpoints *Am J Clin Nutr* 2016;104(6):1671-1682. PMID 27806972	1,075 randomised, 538 to green tea extract and 537 to placebo. 936 women completed this substudy Healthy postmenopausal women. Stratified by COMT genotype activity. Registered NCT00917735	843 mg EGCG per day, 4 capsules daily, for 12 months Capsule extract. This is above the EU ceiling of under 800 mg per daily portion	Total cholesterol −2.1% against +0.7% placebo, P = 0.0004. LDL cholesterol −4.1% against +0.9%, P < 0.0001. Non-HDL cholesterol −3.1% against +0.4%, P = 0.0032. Triglycerides increased 3.6% in the green tea extract group while decreasing 2.5% in the placebo group, P = 0.046. The total cholesterol reduction was seen only in women with baseline total cholesterol at or above 200 mg/dL, P-interaction = 0.01	No change in HDL cholesterol concentration. The triglyceride increase was mainly observed among obese women and statin users, but that subgroup difference did not reach significance: P-interaction = 0.06
Type. Clinical outcome **Human trial.** Yes. Randomised, placebo controlled, parallel arm. Ancillary study of a breast cancer biomarker trial **Substance tested.** Green tea extract supplement containing 1,315 mg total catechins, of which 843 mg EGCG **Blinding.** Double blind **Control.** Identical placebo capsules **Funding.** National Cancer Institute R01 CA127236, UM1 CA182876 and R35 CA197222; Department of Defense / US Army Medical Research W81XWH-11-1-0013; Cancer Center Support Grants P30 CA077598 and P30 CA047904. Supplement "Green Tea Extract Catechin Complex, Corban Complex GTB" manufactured and provided by Corban Laboratories / Eniva Nutraceutics, from leaves grown by Youshan Tea Farm, China, supplied by Taiyo Green Power Co. Ltd. Placebo was maltodextrin and cellulose **Competing interests.** "The sponsor and the supplement manufacturer had no influence on the execution of the study, analysis and interpretation of data, or the final manuscript. No potential conflicts of interest were disclosed"				

SOURCE	SAMPLE AND POPULATION	DOSE AND FORM	WHAT IT FOUND	WHAT IT DID NOT FIND
Kovacs et al. 2004 *Br J Nutr* 2004;91(3):431-7. PMID 15005829. doi 10.1079/BJN20041061	104 overweight and moderately obese men and women, aged 18 to 60, BMI 25 to 35 Both sexes. Netherlands. Single centre	323 mg EGCG a day for 13 weeks, following a 4 week very low energy diet. That is just above the 90 to 300 mg habitual tea range in Section 3, What It Does Beverage	Subjects lost 6.4 kg, 7.5% of body weight, during the diet phase. In the green tea group, habitual high caffeine consumers regained more than habitual low caffeine consumers, 39% against 16%, P < 0.05	**Weight regain was not significantly different between green tea and placebo**, 30.5% against 19.7%. The authors conclude weight maintenance after 7.5% loss was not affected by green tea
Type. Clinical outcome, weight maintenance **Human trial.** Yes **Substance tested.** Green tea, stated by the authors as 573 mg catechins a day of which 323 mg was epigallocatechin gallate, plus 104 mg caffeine. **This is the only one of the four trials in this section that states its EGCG content Blinding.** Not stated in the abstract HELD BY THE PUBLISHER **Control.** Placebo, parallel design **Funding.** Not established. Article is subscription gated HELD BY THE PUBLISHER				
Nagao et al. 2007 *Obesity (Silver Spring)* 2007;15(6):1473-83. PMID 17557985. doi 10.1038/oby.2007.176	240 analysed per protocol, 123 catechin and 117 control Japanese men and women with visceral fat type obesity. Multicentre, randomisation stratified by sex and BMI	583 mg catechins a day for 12 weeks after a 2 week run in Beverage	Greater decreases in the catechin group in body weight, BMI, body fat ratio, body fat mass, waist and hip circumference, visceral fat area and subcutaneous fat area. Greater systolic blood pressure decrease in those starting at 130 mmHg or above. Greater LDL decrease. No adverse effect reported	Effect sizes are not given in the abstract HELD BY THE PUBLISHER. The comparator was tea at 96 mg catechins rather than no tea, so this is a high against low catechin comparison and not tea against nothing
Type. Clinical outcome, body composition **Human trial.** Yes **Substance tested.** Green tea containing 583 mg catechins a day, against a control tea at 96 mg. EGCG content is not stated in the abstract HELD BY THE PUBLISHER **Blinding.** Double blind **Control.** Green tea at 96 mg catechins, not a placebo without tea **Funding.** Not established in the abstract. **The first author's stated affiliation is Health Care Food Research Laboratories, Kao Corporation**, which sells catechin beverages HELD BY THE PUBLISHER				
Maki et al. 2009 *J Nutr* 2009;139(2):264-70. PMID 19074207. doi 10.3945/jn.108.098293	132 randomised, 107 completers Overweight and obese adults, both sexes, aged into the 60s. United States	Approximately 625 mg catechins a day for 12 weeks, alongside 180 minutes a week of prescribed exercise Beverage	Total abdominal fat area fell 7.7% against 0.3%, P = 0.013. Subcutaneous abdominal fat area fell 6.2% against 0.8%, P = 0.019. Fasting triglycerides fell 11.2% against a 1.9% rise, P = 0.023	**Body weight change did not reach significance**, 2.2 kg against 1.0 kg, P = 0.079. **Percentage change in fat mass did not differ**, P = 0.208. Every participant was also exercising, so this does not isolate the beverage
Type. Clinical outcome, body composition with an exercise co intervention **Human trial.** Yes **Substance tested.** Green tea catechin beverage, approximately 625 mg catechins with 39 mg caffeine, against a control beverage with 39 mg caffeine and no catechins. EGCG content is not stated in the abstract HELD BY THE PUBLISHER **Blinding.** Double blind **Control.** Caffeine matched beverage without catechins, which separates catechin from caffeine **Funding.** Not established in the abstract. First author's stated affiliation is Provident Clinical Research; affiliations for the other authors are not given in the record HELD BY THE PUBLISHER				
Wang et al. 2010 *Obesity (Silver Spring)* 2010;18(4):773-9. PMID 19680234. doi 10.1038/oby.2009.256	182 moderately overweight Chinese subjects Chinese adults, both sexes. Moderately overweight	Four arms across a range, for 90 days. **This is the only trial in the file that compares catechin doses against each other within one study** Beverage	At the highest dose only, GT3 at 886 mg: intra abdominal fat area down 5.6 cm^2, waist circumference down 1.9 cm, body weight down 1.2 kg against control, P < 0.05. At the middle doses, smaller isolated changes: total body fat down 0.7 kg at GT2 and body fat percentage down 0.6% at GT1	The waist and body weight reductions did not appear at 458 or 468 mg catechins. Caffeine rose with catechin dose across the arms, so dose and caffeine are not separated
Type. Clinical outcome, body composition, dose ranging **Human trial.** Yes **Substance tested.** Four catechin doses in one trial: control 30 mg, GT1 458 mg, GT2 468 mg and GT3 886 mg catechins a day, with caffeine from 10 to 198 mg. EGCG content is not stated in the abstract HELD BY THE PUBLISHER **Blinding.** Not stated in the abstract HELD BY THE PUBLISHER. Described as randomised placebo controlled **Control.** Control drink at 30 mg catechins **Funding.** Not established in the abstract. **Several authors' stated affiliation is Unilever R&D, Shanghai** HELD BY THE PUBLISHER				

SOURCE	SAMPLE AND POPULATION	DOSE AND FORM	WHAT IT FOUND	WHAT IT DID NOT FIND
Hoofnagle et al. 2021, US DILIN *Hepatology* 2021;73(6):2484-2493. PMID 32892374	1,414 patients who underwent formal causality assessment. 40 episodes in 38 different patients attributed to green tea, 3% of the cohort; two patients were enrolled twice with a second episode 1 to 4 years after the first. 202 attributed to supplements without green tea, 1,142 to conventional drugs United States. Age 17 to 69 years, median 40 at onset. 74% women. Most were white and 36% were of self reported Hispanic ethnicity. The stated reason for taking the supplement was weight loss in 29 of 40 (73%) and boosting energy in 4 of 40 (10%)	Not stated. Products self selected by patients Commercial supplement products, composition varying	Symptom onset 15 to 448 days after starting, median 72. Injury hepatocellular in 38 of 40 (95%), jaundiced in 33 of 40 (83%), judged severe in 14 of 40 (35%), necessitating liver transplantation in 3 of 40 (8%). Injury recurred on re-exposure in 3 instances, with similar features and shorter time to onset. HLA-B*35:01 found in 72% of green tea cases (95% CI 58 to 87), against 15% (95% CI 10 to 20) of cases from other supplements, 12% (95% CI 10 to 14) attributed to drugs, and 11% (95% CI 10.5 to 11.5) of population controls	No green tea case was cholestatic, against 22% of other supplement cases and 24% of drug cases. Chronic injury was uncommon at 3%, against 18% for conventional drugs. Liver biopsies were available from only 15 of 40 (38%). The denominator behind the 72% HLA figure is not given in the text retrieved
Type. Clinical, adverse outcome **Human trial.** No. Prospective network cohort with formal causality assessment **Substance tested.** Green tea containing commercial supplements, not isolated EGCG. The paper gives the breakdown: green tea extract alone in 8 of 40 episodes (20%), a multi ingredient product in 32 of 40 (80%). The multi ingredient products contained 4 to 60 active ingredients, median 11.5, and only 7 of 32 (22%) had "green tea" in their commercial name. Green tea was present as an extract in tablet or capsule form in all but 2 products, one a powder for making tea and one a liquid spray. In one case the implicated product had no detectable green tea on analysis **Blinding.** Not applicable to exposure. The paper states green tea causality was scored before the chemical analyses and the HLA typing results were known **Control.** Comparison groups within the cohort, plus population controls for HLA frequency **Funding.** Sponsor: Duke University. Collaborator: National Institute of Diabetes and Digestive and Kidney Diseases. Source: ClinicalTrials.gov NCT00345930, the DILIN prospective study registration				
Yu et al. 2017, Minnesota Green Tea Trial liver endpoints *Cancer Prev Res (Phila)* 2017;10(10):571-579. PMID 28765194	1,075 women enrolled. This analysis covers 1,021 participants with normal baseline liver enzyme levels: 513 green tea extract and 508 placebo Postmenopausal women aged 50 to 70, United States. The paper states all participants were healthy postmenopausal women and "virtually all were Caucasian," and names generalisability as the study's major limitation. Registration required heterogeneously or extremely dense breasts. Excluded at entry: elevated baseline liver enzymes, hepatitis B or C, current smokers, BMI under 19 or over 40, more than 7 alcoholic drinks per week, and regular green tea drinkers. Original endpoint was breast cancer risk biomarkers	843 mg EGCG per day for 12 months Capsule extract. Above the EU ceiling of under 800 mg per daily portion	Alanine aminotransferase rose 5.4 U/L (95% CI 3.6 to 7.1) and aspartate aminotransferase 3.8 U/L (95% CI 2.5 to 5.1), both significantly higher than placebo, P < 0.001. 26 of 513 (5.1%) in the green tea extract arm developed moderate or more severe abnormality in any liver function measure, odds ratio 7.0 (95% CI 2.4 to 20.3) against placebo. ALT returned to normal after dechallenge and rose again after one or more rechallenges	The analysis excludes the 54 of 1,075 enrolled women who did not have normal baseline liver enzymes, so it does not describe risk in that group

SOURCE	SAMPLE AND POPULATION	DOSE AND FORM	WHAT IT FOUND	WHAT IT DID NOT FIND
Type. Clinical, adverse outcome **Human trial.** Yes. Randomised, placebo controlled, double blinded, phase II **Substance tested.** Green tea extract containing 1,315 mg total catechins, of which 843 mg EGCG. Dose source: Samavat 2016, the parent trial report. Supply chain named in the paper: extracted with ethyl acetate, decaffeinated and spray dried by Taiyo Green Power Co. Ltd, Wuxi, China; imported by Taiyo International Inc, Minneapolis; encapsulated by Corban Laboratories / Eniva Nutraceutics, Plymouth, Minnesota, which produced and provided both the active and the identical placebo capsules; catechin content of all eight batches quantified by Covance Laboratories, Madison, Wisconsin **Blinding.** Double blinded **Control.** Placebo **Funding.** National Cancer Institute R01 CA127236 to M.S. Kurzer, UM1 CA182876 to J.-M. Yuan, R35 CA197222 to T.W. Kensler; Department of Defense / US Army Medical Research W81XWH-11-1-0013 to H. Samavat; Cancer Center Support Grants P30 CA077598, University of Minnesota Masonic Cancer Center, and P30 CA047904, University of Pittsburgh Cancer Institute. Corban Laboratories / Eniva Nutraceutics provided the study supplement **Competing interests.** "L.M. Butler is an epidemiologist at Genentech, Inc. No potential conflicts of interest were disclosed by the other authors"			

5 The Research That Cuts Against It

Same format, same fields, same size. Several of these entries are the same studies recorded above, listed here so that a reader looking for the counter evidence finds it collected rather than distributed.

TABLE 5.1 FINDINGS THAT RUN AGAINST THE COMMON CLAIMS

COMMON CLAIM	HUMAN FINDING THAT RUNS AGAINST IT	DOSE AND FORM IN THAT STUDY	SOURCE
Supports weight loss	Pooled weight difference outside Japan −0.04 kg (95% CI −0.5 to 0.4), P = 0.88, 532 participants. Authors state it is "not likely to be clinically important"	Varies by trial	Jurgens 2012, PMID 23235664
Supports weight loss	Weight −0.78 kg (95% CI −2.31 to 0.75), P = 0.32, n = 301	Varies by trial	Baladia 2014, PMID 24558988
Reduces fat mass meaningfully	Fat mass −0.76 percentage points (95% CI −1.44 to −0.09), P = 0.03, which the authors state "was not clinically relevant"	Varies by trial	Baladia 2014, PMID 24558988
Regulates appetite hormones	Leptin P = 0.156 and ghrelin P = 0.499, neither significant, 11 trials	Varies by trial	Haghighatdoost 2017, PMID 29129232
Anti inflammatory	CRP weighted mean difference 0.085 mg/L (95% CI −0.225 to 0.395), P = 0.592, null in all six subgroups tested	Under and over 400 mg/day catechins	Serban 2015, PMID 26233863
Anti inflammatory	IL-6 significantly increased; CRP not significantly decreased	Varies by trial	Haghighatdoost and Hariri 2019, PMID 31309655
Activates your antioxidant defences	NRF2/ARE binding in PBMCs not increased, P = 0.12; catalase P = 0.12; 8-OHdG P = 0.42	500 mg/day green tea polyphenols, 6 days	Thorley 2023, PMID 37439906
Activates your antioxidant defences	No protection against UV induced erythema after 4 weeks	800 mg/day EGCG, capsule	Chow 2003, PMID 12960117
Inhibits COMT	COMT activity significantly increased by 24%	750 mg EGCG, single dose	Lorenz 2014, PMID 24972245
Burns calories through catechins	Energy expenditure rose 428.0 kJ with catechin plus caffeine and 429.1 kJ with caffeine alone; fat oxidation with caffeine alone P = 0.11	Dose response per mg	Hursel 2011, PMID 21366839
Epigenetic modulation	Acetylated histone H3 and Ki-67 not significantly affected in the same subjects whose DNMT1 mRNA fell	800 mg/day EGCG, capsule	Hu 2016, PMID 27923410
Prevents cancer	Cancer related mortality RR 0.99 (95% CI 0.91 to 1.07), 8 studies, 504,366 participants	Varies by study	Filippini 2020, PMID 32118296

COMMON CLAIM	HUMAN FINDING THAT RUNS AGAINST IT	DOSE AND FORM IN THAT STUDY	SOURCE
Prevents cancer	Cancer mortality hazard ratios "not significantly different from 1.00 in all green tea categories"	Self reported cups per day, beverage	Kuriyama 2006, PMID 16968850
Improves the lipid panel	Triglycerides rose 3.6% against a 2.5% fall on placebo, P = 0.046	843 mg/day EGCG, capsule, 12 months	Samavat 2016, PMID 27806972
Safe at supplement doses	26 of 513 (5.1%) developed moderate or worse liver abnormality, OR 7.0 (95% CI 2.4 to 20.3)	843 mg/day EGCG, capsule, 12 months	Yu 2017, PMID 28765194
Does not interact with medicines	Nadolol Cmax ratio 0.318 and AUC 0 to 8 ratio 0.371 against water. Taken one hour before the drug rather than with it, Cmax ratio 0.465	One 150 mL cup of brewed green tea, 166 mg EGCG	Misaka 2020, PMID 32320490
Does not interact with medicines	Lisinopril Cmax ratio 0.289 and AUC to infinity ratio 0.337	300 mg EGCG as aqueous extract, single dose	Misaka 2021, PMID 33048477
Does not interact with medicines	Fexofenadine AUC to infinity ratio 0.296 and urinary excretion ratio 0.335	300 mg EGCG as aqueous extract, single dose	Misaka 2022, PMID 35678032
Cell studies show what it does in a body	At 1 mM in culture medium, EGCG generates over 400 micromolar hydrogen peroxide within 2 hours, which the authors say could account for some or all of the reported effects on cells	1 mM, about 135 times the highest concentration measured in a person	Long, Clement and Halliwell 2000, PMID 10873562
Green tea changes your gut bacteria	Authors' own conclusion: "Green tea supplementation for 12 weeks did not have a significant effect on composition of the gut microbiota"	More than 560 mg EGCG per day, capsule, 12 weeks	Janssens 2016, PMID 27054321

5.1 The dose where benefit was measured, beside the dose where harm was measured

This section places the benefit side and the harm side against each other. It carries material from the rows above and adds no new source.

TABLE 5.2 BENEFIT BESIDE HARM

	ENTRY
Benefit observed at	583 mg total catechins per day, capsule extract, 12 weeks (Nagao 2007). Approximately 625 mg total catechins per day, capsule extract, 12 weeks, alongside 180 minutes a week of prescribed exercise (Maki 2009). 886 mg total catechins per day, brewed beverage, 90 days, in the only trial that compares doses within one study, with no change at its 458 and 468 mg arms (Wang 2010). The one trial that states its EGCG content, 323 mg EGCG per day as capsule extract for 13 weeks, found no significant effect on weight regain (Kovacs 2004)

	ENTRY
Harm observed at	843 mg EGCG per day, capsule extract, 12 months. 26 of 513 (5.1%) developed moderate or more severe abnormality in a liver function measure, odds ratio 7.0 (95% CI 2.4 to 20.3) against placebo (Yu 2017). No trial or case series in this file records liver injury at brewed infusion doses. The DILIN case series does not state a dose, because the products were self selected (Hoofnagle 2021)
Susceptibility marker	HLA-B*35:01, carried by 72% of green tea liver injury cases (95% CI 58 to 87) against 11% of population controls (95% CI 10.5 to 11.5). The green tea series is 40 episodes in 38 patients, drawn from 1,414 patients who underwent formal causality assessment; the exact denominator behind the 72% is not given in the text retrieved, and the denominator behind the control figure is not stated in the record. Within the cases, carriers were younger, reached onset sooner, had higher initial ALT, and had rash and fever in 27% against 0% of non carriers. Every one of those features describes a carrier after injury has begun. No physical sign and no routine laboratory value in this file identifies a carrier beforehand; the allele is read by HLA typing (Hoofnagle 2021)
Regulatory ceiling	Under 800 mg EGCG per daily portion of food, European Union, applies from 2023-06-21, with three mandatory label warnings: not alongside other green tea products the same day, not for pregnant or lactating women or anyone under 18, and not on an empty stomach. Aqueous extracts reconstituted to a composition comparable to traditional green tea infusions are excluded from the ceiling. No United States equivalent was identified in this search as of 2026-09-17
Comparable basis	Not comparable as published. The harm figure is isolated EGCG in a capsule. The clearest benefit figures are total catechins, one of them a beverage, and three of the four beverage dose trials do not publish their EGCG fraction. Total catechins and EGCG do not convert at a fixed ratio

TABLE 5.3 THE THREE FORMS, KEPT APART

FORM	EGCG PER DAY, WHERE STATED	BENEFIT MEASURED IN THIS FORM	HARM MEASURED IN THIS FORM
Brewed infusion	90 to 300 mg habitual mean intake (EFSA, via the EU recitals). One measured 150 mL cup gave approximately 166 mg EGCG and 539 ± 39 mg total catechins (Misaka 2020)	Lower all cause mortality at 5 or more cups a day against under 1 in an 11 year cohort, women HR 0.77, men HR 0.88 (Kuriyama 2006). Intra abdominal fat, waist and weight moved at the 886 mg total catechin arm only (Wang 2010)	No liver injury recorded at infusion doses anywhere in this file. What is recorded is a drug interaction: one 150 mL cup cut nadolol Cmax to 0.318 of control, and taking the tea an hour earlier only halved the effect (Misaka 2020)
Total catechin extract	Usually not published. Wang 2010's EGCG content is held by the publisher	Body weight, BMI, body fat, waist, hip, visceral and subcutaneous fat at 583 mg total catechins (Nagao 2007). Abdominal fat area down 7.7% against 0.3% at approximately 625 mg with prescribed exercise (Maki 2009)	Not separable in this file. The trial that produced the liver signal states its dose as EGCG, not as total catechins
Isolated EGCG, capsule	Stated on every row	No significant effect on weight regain at 323 mg (Kovacs 2004). Total cholesterol down 2.1% and LDL down 4.1% at 843 mg, in women starting at or above 200 mg/dL total cholesterol (Samavat 2016)	The liver signal at 843 mg (Yu 2017). Triglycerides rose 3.6% against a 2.5% fall on placebo at the same dose, P = 0.046 (Samavat 2016)

The European Union regulation treats brewed infusion and extract as different products.

What each form carries, and what it does not. The two sides of this file do not sit in the same place, and the shape of the evidence differs as much as the dose does.

One harm does not follow the concentration gradient. The drug interaction appears at both ends. One 150 mL cup of brewed tea cut nadolol Cmax to 0.318 of control, and 300 mg of purified EGCG in water cut lisinopril to 0.337 and fexofenadine to 0.296. Taking the drug an hour after the tea halved the effect rather than removing it. Pseudoephedrine was unaffected.

Duration is not matched across the two sides. The liver signal was measured over 12 months. Every benefit trial above ran 12 or 13 weeks. The harm exposure is roughly four times longer than anything on the benefit side. Neither figure is extrapolated to the other's duration here.

The empty stomach warning names a real condition. Commission Regulation (EU) 2022/2340, jurisdiction European Union, requires the label to say not on an empty stomach. The pharmacokinetic studies that set the exposure figures in Section 3, What It Does, Ullmann 2003 and Chow 2001, dosed fasting, which is the condition the warning names. The file records both and draws no conclusion about what a fed dose would produce.

Wang 2010 reports total catechins and its EGCG content is held by the publisher, so its arms cannot be placed on the EGCG axis. Nagao 2007 and Maki 2009 report total catechins and do not publish an EGCG fraction. Applying one trial's catechin to EGCG ratio to another trial's product would produce a number with no source behind it, and none is produced here.

5.2 Where a regulator has drawn a line

The European Union set a limit of under 800 mg EGCG a day in food, with warnings that have to appear on the label, because concentrated extracts have been linked to liver injury. Brewed tea at ordinary strength is excluded from that limit. The United States has set no equivalent (Row 38).

How to use this section. Claims, labels, advertising and submissions are decided by your regulatory team, for the jurisdiction you are selling into. What this section gives them is the current source documents to work from, each one named with the jurisdiction it applies in.

6 The Sources

Every source in this file, with its full citation and who paid for the work. No source here is cited by identifier alone.

Funding basis. REGISTRY sponsor and collaborator from the trial registration. PAPER funder, grant number or commercial interest stated in the article. NONE STATED the article contains no funding statement, which is recorded as a finding rather than a blank. SUBSCRIPTION GATED the funding statement sits in full text sold by the publisher. Not applicable the source is a supporting source, cited as accepted background rather than as evidence about the subject of this file. Funding basis is not tracked for these.

TABLE 6.1 SOURCE REGISTER, EVERY SOURCE NAMED IN FULL

#	FULL CITATION	FUNDING BASIS	WHO PAID, AND ANY DECLARED INTEREST
1	Lu H, Zhang J, Yang Y, et al. Earliest tea as evidence for one branch of the Silk Road across the Tibetan Plateau. *Sci Rep*. 2016;6:18955. PMID 26738699. doi 10.1038/srep18955	NONE STATED	No funding statement appears in the article. NLM indexes it as non United States government support
2	Fujiki H, Suganuma M, Okabe S, et al. Mechanistic findings of green tea as cancer preventive for humans. *Proc Soc Exp Biol Med*. 1999;220(4):225-8. PMID 10202393. doi 10.1046/j.1525-1373.1999.d01-38.x	SUBSCRIPTION GATED	Not established. NLM indexes non United States government support. Authors at Saitama Cancer Center Research Institute
3	Kuriyama S, Shimazu T, Ohmori K, et al. Green tea consumption and mortality due to cardiovascular disease, cancer, and all causes in Japan: the Ohsaki study. *JAMA*. 2006;296(10):1255-65. PMID 16968850. doi 10.1001/jama.296.10.1255	SUBSCRIPTION GATED	Not established. NLM indexes non United States government support
4	Filippini T, Malavolti M, Borrelli F, et al. Green tea (Camellia sinensis) for the prevention of cancer. *Cochrane Database Syst Rev*. 2020;3:CD005004. PMID 32118296. doi 10.1002/14651858.CD005004.pub3	SUBSCRIPTION GATED	Not established. Cochrane Library refuses automated access
5	Ullmann U, Haller J, Decourt JP, et al. A single ascending dose study of epigallocatechin gallate in healthy volunteers. *J Int Med Res*. 2003;31(2):88-101. PMID 12760312. doi 10.1177/147323000303100205	NONE STATED	No funding statement appears in the article. The clinical work was conducted by PAREXEL-CEMAF, Poitiers, a contract research organisation, under research direction from Roche Vitamins Ltd, Basel, a commercial nutritional ingredient business. Visible only from the affiliations and methods

#	FULL CITATION	FUNDING BASIS	WHO PAID, AND ANY DECLARED INTEREST
6	Chow HH, Cai Y, Alberts DS, et al. Phase I pharmacokinetic study of tea polyphenols following single-dose administration of epigallocatechin gallate and polyphenon E. *Cancer Epidemiol Biomarkers Prev*. 2001;10(1):53-8. PMID 11205489	PAPER	"Supported by Contract N01-CN-85179 from the National Cancer Institute." Material supplied by Food Research Laboratories, Mitsui Norin Co., Ltd., via the NCI
7	Chow HH, Cai Y, Hakim IA, et al. Pharmacokinetics and safety of green tea polyphenols after multiple-dose administration of epigallocatechin gallate and polyphenon E in healthy individuals. *Clin Cancer Res*. 2003;9(9):3312-9. PMID 12960117	PAPER	"Supported by a contract (N01-CN-85179) from the National Cancer Institute." Material supplied by the NCI Chemoprevention Agent Development Research Group
8	Foster DR, Sowinski KM, Chow HH, Overholser BR. Limited sampling strategies to estimate exposure to the green tea polyphenol, epigallocatechin gallate, in fasting and fed conditions. *Ther Drug Monit*. 2007;29(6):835-42. PMID 18043484. doi 10.1097/FTD.0b013e31815bf58b	SUBSCRIPTION GATED	Not established
9	Henning SM, Wang P, Lee RP, et al. Prospective randomized trial evaluating blood and prostate tissue concentrations of green tea polyphenols and quercetin in men with prostate cancer. *Food Funct*. 2020;11(5):4114-4122. PMID 32347270. doi 10.1039/d0fo00565g	SUBSCRIPTION GATED	Not established
10	Brune M, Rossander L, Hallberg L. Iron absorption and phenolic compounds: importance of different phenolic structures. *Eur J Clin Nutr*. 1989;43(8):547-57. PMID 2598894	SUBSCRIPTION GATED	Not established. NLM indexes non United States government support. Authors at University of Göteborg
11	Misaka S, Yatabe J, Müller F, et al. Green tea ingestion greatly reduces plasma concentrations of nadolol in healthy subjects. *Clin Pharmacol Ther*. 2014;95(4):432-8. PMID 24419562. doi 10.1038/clpt.2013.241	SUBSCRIPTION GATED	Not established. NLM indexes non United States government support

#	FULL CITATION	FUNDING BASIS	WHO PAID, AND ANY DECLARED INTEREST
12	Ide K, Park M, Yamada H. The effect of green tea with exceptionally high catechin content on nadolol plasma concentration. *Clin Pharmacol Ther*. 2014;95(6):588. PMID 24553283. doi 10.1038/clpt.2014.36	SUBSCRIPTION GATED	Not established. A published Letter and Comment responding to row 11. Authors at University of Shizuoka
13	Misaka S, Abe O, Ono T, et al. Effects of single green tea ingestion on pharmacokinetics of nadolol in healthy volunteers. *Br J Clin Pharmacol*. 2020;86(11):2314-2318. PMID 32320490. doi 10.1111/bcp.14315	PAPER	"This study was partly supported by the Honjo International Scholarship Foundation (Food and Health Program 2015), Tokyo, Japan, and JSPS KAKENHI Grant Number JP17K17983." Competing interests: "The authors declare no competing interests"
14	Misaka S, Ono Y, Uchida A, et al. Impact of green tea catechin ingestion on the pharmacokinetics of lisinopril in healthy volunteers. *Clin Transl Sci*. 2021;14(2):476-480. PMID 33048477. doi 10.1111/cts.12905	PAPER	"This work was partly supported by The Nakatomi Foundation and JSPS KAKENHI Grant Number JP17K17983." Competing interests: "The authors declared no competing interests for this work." Material: Sunphenon-EGCG, Taiyo Kagaku
15	Misaka S, Ono Y, Taudte RV, et al. Exposure of fexofenadine, but not pseudoephedrine, is markedly decreased by green tea extract in healthy volunteers. *Clin Pharmacol Ther*. 2022;112(3):627-634. PMID 35678032. doi 10.1002/cpt.2682	PAPER	"This study was partly supported by JSPS KAKENHI Grant Number 17K17983 and 17K08949." Competing interests: "The authors declared no competing interests for this work." Material: Sunphenon-EGCG, Taiyo Kagaku
16	Long LH, Clement MV, Halliwell B. Artifacts in cell culture: rapid generation of hydrogen peroxide on addition of (-)-epigallocatechin, (-)-epigallocatechin gallate, (+)-catechin, and quercetin to commonly used cell culture media. *Biochem Biophys Res Commun*. 2000;273(1):50-3. PMID 10873562. doi 10.1006/bbrc.2000.2895	SUBSCRIPTION GATED	Not established. NLM indexes non United States government support. Authors at National University of Singapore
17	Thorley J, Thomas C, Thon N, et al. Combined effects of green tea supplementation and eccentric exercise on nuclear factor erythroid 2-related factor 2 activity. *Eur J Appl Physiol*. 2023;124(1):245-256. PMID 37439906. doi 10.1007/s00421-023-05271-8	PAPER	"This study received no funding." Competing interests: "The authors declare no conflict of interest." Supplement manufactured by Taiyo Kagaku; inulin placebo by Blackburn Distributions

#	FULL CITATION	FUNDING BASIS	WHO PAID, AND ANY DECLARED INTEREST
18	Serban C, Sahebkar A, Antal D, et al. Effects of supplementation with green tea catechins on plasma C-reactive protein concentrations. *Nutrition*. 2015;31(9):1061-71. PMID 26233863. doi 10.1016/j.nut.2015.02.004	SUBSCRIPTION GATED	Not established
19	Haghighatdoost F, Hariri M. The effect of green tea on inflammatory mediators: a systematic review and meta-analysis of randomized clinical trials. *Phytother Res*. 2019;33(9):2274-2287. PMID 31309655. doi 10.1002/ptr.6432	SUBSCRIPTION GATED	Not established
20	Lorenz M, Paul F, Moobed M, et al. The activity of catechol-O-methyltransferase (COMT) is not impaired by high doses of epigallocatechin-3-gallate (EGCG) in vivo. *Eur J Pharmacol*. 2014;740:645-51. PMID 24972245. doi 10.1016/j.ejphar.2014.06.014	SUBSCRIPTION GATED	Not established. NLM indexes non United States government support. Authors at Charité Berlin and the German Centre for Cardiovascular Research; one author at Institut Prof. Dr. Georg Kurz GmbH, a commercial laboratory
21	Hu Y, McIntosh GH, Le Leu RK, et al. Supplementation with Brazil nuts and green tea extract regulates targeted biomarkers related to colorectal cancer risk in humans. *Br J Nutr*. 2016;116(11):1901-1911. PMID 27923410. doi 10.1017/S0007114516003937	PAPER	"This study was supported by the National Health and Medical Research Council of Australia (project grant no. 1007501) and Cancer Council of South Australia." Acknowledgements thank "Dr Leonid Ber and Now Foods, USA, for providing GTE capsules and for their support." Conflicts: "The authors declare that there are no conflicts of interest"
22	Hoffmann A, Meir AY, Hagemann T, et al. A polyphenol-rich green Mediterranean diet enhances epigenetic regulatory potential: the DIRECT PLUS randomized controlled trial. *Metabolism*. 2023;145:155594. PMID 37236302. doi 10.1016/j.metabol.2023.155594	SUBSCRIPTION GATED	Not established
23	Hursel R, Viechtbauer W, Dulloo AG, et al. The effects of catechin rich teas and caffeine on energy expenditure and fat oxidation: a meta-analysis. *Obes Rev*. 2011;12(7):e573-81. PMID 21366839. doi 10.1111/j.1467-789X.2011.00862.x	SUBSCRIPTION GATED	Not established

#	FULL CITATION	FUNDING BASIS	WHO PAID, AND ANY DECLARED INTEREST
24	Jurgens TM, Whelan AM, Killian L, et al. Green tea for weight loss and weight maintenance in overweight or obese adults. *Cochrane Database Syst Rev*. 2012;12:CD008650. PMID 23235664. doi 10.1002/14651858.CD008650.pub2	SUBSCRIPTION GATED	Not established. Cochrane Library refuses automated access
25	Baladia E, Basulto J, Manera M, Martínez R, Calbet D. Effect of green tea or green tea extract consumption on body weight and body composition; systematic review and meta-analysis. *Nutr Hosp*. 2014;29(3):479-90. PMID 24558988. doi 10.3305/nh.2014.29.3.7118. Published in Spanish	NONE STATED	No funding statement and no conflict of interest statement appear anywhere in the article. Authors affiliated with GREP-AEDN, the review and position group of the Spanish dietitians and nutritionists association
26	Haghighatdoost F, Nobakht M Gh BF, Hariri M. Effect of green tea on plasma leptin and ghrelin levels: a systematic review and meta-analysis of randomized controlled clinical trials. *Nutrition*. 2017;45:17-23. PMID 29129232. doi 10.1016/j.nut.2017.06.022	SUBSCRIPTION GATED	Not established
27	Khalesi S, Sun J, Buys N, et al. Green tea catechins and blood pressure: a systematic review and meta-analysis of randomised controlled trials. *Eur J Nutr*. 2014;53(6):1299-311. PMID 24861099. doi 10.1007/s00394-014-0720-1	NONE STATED	No funding statement appears in the article. Competing interests: "On behalf of all authors, the corresponding author states that there is no conflict of interest"
28	Samavat H, Newman AR, Wang R, Yuan JM, Wu AH, Kurzer MS. Effects of green tea catechin extract on serum lipids in postmenopausal women: a randomized, placebo-controlled clinical trial. *Am J Clin Nutr*. 2016;104(6):1671-1682. PMID 27806972. doi 10.3945/ajcn.116.137075	PAPER and REGISTRY	Parent trial NCT00917735, sponsor University of Minnesota, collaborator National Cancer Institute. Grants recorded on row 29. Supplement manufactured and provided by Corban Laboratories / Eniva Nutraceutics, leaves from Youshan Tea Farm supplied by Taiyo Green Power Co. Ltd. Conflicts: "The sponsor and the supplement manufacturer had no influence on the execution of the study, analysis and interpretation of data, or the final manuscript. No potential conflicts of interest were disclosed"

#	FULL CITATION	FUNDING BASIS	WHO PAID, AND ANY DECLARED INTEREST
29	Yu Z, Samavat H, Dostal AM, et al. Effect of green tea supplements on liver enzyme elevation: results from a randomized intervention study in the United States. *Cancer Prev Res (Phila)*. 2017;10(10):571-579. PMID 28765194. doi 10.1158/1940-6207.CAPR-17-0160	PAPER and REGISTRY	National Cancer Institute R01 CA127236, UM1 CA182876, R35 CA197222; Department of Defense / US Army Medical Research W81XWH-11-1-0013; Cancer Center Support Grants P30 CA077598 and P30 CA047904. Supplement provided by Corban Laboratories / Eniva Nutraceutics. Parent trial NCT00917735. Conflicts: "L.M. Butler is an epidemiologist at Genentech, Inc. No potential conflicts of interest were disclosed by the other authors"
30	Hoofnagle JH, Bonkovsky HL, Phillips EJ, et al. HLA-B*35:01 and green tea-induced liver injury.* Hepatology*. 2021;73(6):2484-2493. PMID 32892374. doi 10.1002/hep.31538	REGISTRY	DILIN prospective study, ClinicalTrials.gov NCT00345930, sponsor Duke University, collaborator National Institute of Diabetes and Digestive and Kidney Diseases. The article's own funding statement sits in the Wiley full text, which refuses automated access
31	Björnsson ES, Bergmann OM, Björnsson HK, Kvaran RB, Olafsson S. Incidence, presentation, and outcomes in patients with drug-induced liver injury in the general population of Iceland. *Gastroenterology*. 2013;144(7):1419-25. PMID 23419359. doi 10.1053/j.gastro.2013.02.006	SUBSCRIPTION GATED	Not established. NLM indexes non United States government support
32	Del Rio D, Calani L, Cordero C, et al. Bioavailability and catabolism of green tea flavan-3-ols in humans. *Nutrition*. 2010;26(11-12):1110-6. PMID 20080030. doi 10.1016/j.nut.2009.09.021	SUBSCRIPTION GATED	Not established. Authors at the University of Parma
33	Clarke KA, Dew TP, Watson REB, et al. Green tea catechins and their metabolites in human skin before and after exposure to ultraviolet radiation. *J Nutr Biochem*. 2015;27:203-10. PMID 26454512. doi 10.1016/j.jnutbio.2015.09.001	PAPER	No funder named in the article text. NLM indexes Research Support, Non-U.S. Gov't. Ethics approval North Manchester Research Ethics Committee 08/H1006/79. Authors at the University of Leeds and the University of Manchester
34	Kovacs EMR, Lejeune MPGM, Nijs I, Westerterp-Plantenga MS. Effects of green tea on weight maintenance after body-weight loss. *Br J Nutr*. 2004;91(3):431-7. PMID 15005829. doi 10.1079/BJN20041061	SUBSCRIPTION GATED	Not established. Authors at Maastricht University

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35	Nagao T, Hase T, Tokimitsu I. A green tea extract high in catechins reduces body fat and cardiovascular risks in humans. *Obesity (Silver Spring)*. 2007;15(6):1473-83. PMID 17557985. doi 10.1038/oby.2007.176	SUBSCRIPTION GATED	Not established. First author's stated affiliation is Health Care Food Research Laboratories, Kao Corporation, which sells catechin beverages
36	Maki KC, Reeves MS, Farmer M, et al. Green tea catechin consumption enhances exercise-induced abdominal fat loss in overweight and obese adults. *J Nutr.* 2009;139(2):264-70. PMID 19074207. doi 10.3945/jn.108.098293	SUBSCRIPTION GATED	Not established. First author's stated affiliation is Provident Clinical Research, a contract research organisation. Affiliations for the other authors are not given in the record
37	Wang H, Wen Y, Du Y, et al. Effects of catechin enriched green tea on body composition. *Obesity (Silver Spring)*. 2010;18(4):773-9. PMID 19680234. doi 10.1038/oby.2009.256	SUBSCRIPTION GATED	Not established. Several authors' stated affiliation is Unilever R&D, Shanghai
38	Commission Regulation (EU) 2022/2340 amending Annex III to Regulation (EC) No 1925/2006 as regards green tea extracts containing (−)-epigallocatechin-3-gallate. CELEX 32022R2340. Operative text at eur-lex.europa.eu	Not applicable	European Union legislative instrument
39	NIH LiverTox. Green Tea. National Institute of Diabetes and Digestive and Kidney Diseases. Record last updated 2020-11-20. https://www.ncbi.nlm.nih.gov/books/NBK547925/	Not applicable	United States federal government reference work
40	Janssens PLHR, Penders J, Hursel R, Budding AE, Savelkoul PHM, Westerterp-Plantenga MS. Long-term green tea supplementation does not change the human gut microbiota. *PLoS One*. 2016;11(4):e0153134. PMID 27054321. doi 10.1371/journal.pone.0153134	REGISTRY	Trial registration ClinicalTrials.gov NCT01556321, sponsor Maastricht University Medical Center, no collaborators listed. The article's own funding statement was not retrieved from this environment. Authors at Maastricht University and VU University Medical Center

#	FULL CITATION	FUNDING BASIS	WHO PAID, AND ANY DECLARED INTEREST
41	Most J, Penders J, Lucchesi M, Goossens GH, Blaak EE. Gut microbiota composition in relation to the metabolic response to 12-week combined polyphenol supplementation in overweight men and women. *Eur J Clin Nutr*. 2017;71(9):1040-1045. PMID 28589947. doi 10.1038/ejcn.2017.89	SUBSCRIPTION GATED	Not established. Authors at Maastricht University Medical Center
42	Li Q, Van de Wiele T. Gut microbiota as a driver of the interindividual variability of cardiometabolic effects from tea polyphenols. *Crit Rev Food Sci Nutr*. 2023;63(11):1500-1526. PMID 34515591. doi 10.1080/10408398.2021.1965536	SUBSCRIPTION GATED	Not established. Authors at Ghent University
43	Brindani N, Mena P, Calani L, Benzie I, Choi SW, Brighenti F, Zanardi F, Curti C, Del Rio D. Synthetic and analytical strategies for the quantification of phenyl-γ-valerolactone conjugated metabolites in human urine. *Mol Nutr Food Res*. 2017;61(9). PMID 28440064. doi 10.1002/mnfr.201700077	SUBSCRIPTION GATED	Not established. Authors at the University of Parma and Hong Kong Polytechnic University
44	Ashapkin VV, Kutueva LI, Vanyushin BF. Aging as an Epigenetic Phenomenon. *Curr Genomics*. 2017;18(5):385-407. PMID 29081695. doi 10.2174/1389202918666170412112130	Not applicable	**Supporting source.** A review of an established pattern, cited as accepted background for what ageing does to gene methylation. It is not evidence about the subject of this file and no claim about EGCG rests on it, so funding basis is not tracked
45	Li L, Mao X, Li LX, Xiao H, Lou Z, Liu H, Zhou JX, Yao L, Li X. Feedback loops between DNMT1 and autophagy as well as senescence promotes organ aging and canities. *Autophagy*. 2026;22(10):2809-2830. PMID 42153573. doi 10.1080/15548627.2026.2677185	Not applicable	**Supporting source.** Cited as accepted background for what the maintenance methyltransferase does in ageing tissue, and labelled emerging rather than settled wherever it is used. It is not evidence about the subject of this file and no claim about EGCG rests on it, so funding basis is not tracked. Authors at Mayo Clinic, the University of Rochester Medical Center and the First Hospital of China Medical University

6.1 What the register adds up to

Forty one studies are cited, plus one regulation, one government reference work, and two supporting sources carrying accepted background.

Declared commercial interests, collected. One liver study author is an epidemiologist at Genentech. One epigenetics trial was supplied with capsules by a supplement manufacturer named in the acknowledgements. One pharmacokinetic study ran through a contract research organisation under commercial direction with no sponsorship declared. One COMT study has a co-author at a commercial laboratory. Taiyo Kagaku or its affiliate supplied the material behind four separate findings in this file, some favourable to green tea and some not. Four register rows now come from one university group at Maastricht, covering the weight maintenance trial, the respiration chamber meta analysis and both microbiota trials, and two of those four report the same cohort. None of this invalidates any result. All of it belongs in front of a reader.

7 Fine Print

7.1 What was searched, and what was not

What was searched. PubMed, searched 2026-09-17, for human randomised controlled trials, systematic reviews and meta analyses of green tea, green tea extract or epigallocatechin gallate, covering: body weight and body composition outcomes; the mechanism claims enumerated in Section 3, What It Does; human pharmacokinetics; and liver injury without outcome restriction. Separately, the operative text of Commission Regulation (EU) 2022/2340 via EUR-Lex, and the NIH LiverTox record for green tea. A further axis was searched on 2026-09-29, inside the same cutoff, covering the gut microbial metabolism of green tea catechins: whether supplementation changes the gut microbiota, whether baseline microbiota predicts the metabolic response, and what the colonic catabolites have been shown to do. Seven searches across four phrasings. Every returned result was opened before any negative was stated.

Trial registries. ClinicalTrials.gov was consulted on 2026-09-17 for two named registrations, NCT00917735 and NCT00345930, to obtain the sponsor and collaborator recorded on the register rows that cite them. No trial registry was searched as a source of studies. EudraCT, the EU Clinical Trials Register, the WHO ICTRP, UMIN-CTR and the registries of other jurisdictions were not searched. Registered trials with no publication indexed in PubMed are therefore not in this file, including any that were completed without a published result.

What was not searched. Databases other than those named. Trial registries as a source of studies, as stated above. Indications other than those named. Unpublished, proprietary or in house data. Conference abstracts without full text. Non English publications without a full English translation, with one exception recorded as such (Baladia 2014, published in Spanish, included on the basis of its English abstract). Anything published or indexed after 2026-09-30.

How animal and laboratory work is treated. Laboratory claims are stated in Section 3, What It Does as the claim under test, and are paired with the human study that tested them. No mechanistic finding is presented as a human outcome.

Included regardless of result. Studies reporting no effect and studies reporting harm are included on the same terms and in the same format as studies reporting benefit. Section 5, The Research That Cuts Against It collects the counter findings in one place; every one of them also appears in its own section above.

Not a promise of completeness. What is promised is the breakdown structure and an honest scope statement, not a guarantee that every relevant study was found.

What this file is not. Not regulatory review. Not claim clearance. Not legal advice. Not a guarantee that any statement is permissible. Not medical advice. This file does not evaluate any company's product.

Compiled 2026-09-30 · **Search cutoff** 2026-09-30 · **Review by** 2027-09-30

7.2 Source material held by publishers

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Every source in this file is named in full in Section 6, The Sources, with its authors, journal, year, identifiers, funder where one is stated, and any declared commercial interest. Those are facts about the sources and none of them are held back.

7.3 Review and use

Review. This file carries a compilation date, a literature cutoff, the scope that was searched, and a review date twelve months out. A file past its review date is superseded and should not be relied on without reissue.

What this file is for. It gives you the published evidence on one subject, read and sorted, so your team can see what is known and where it came from. Claim clearance, regulatory submissions and legal review sit with your own regulatory team and counsel. For an individual health decision, the right person to talk to is a licensed clinician.

REVISION HISTORY

VERSION	DATE	CHANGE
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