

CREATINE, CANCER AND THE METASTASIS QUESTION

What the new evidence really changes - and what it does not

A widely used sports supplement is now linked to platelet biology and metastasis in experimental cancer models. That does not mean creatine causes cancer. But dismissing the finding simply because most of the evidence comes from mice would be equally unscientific.

AUTHOR	José M. López, BSc, MD, PhD, LLD (C)
DATE	1 October 2026
FIELD	Oncology / Nutritional Biochemistry / Sports Nutrition / Translational Medicine
STATUS	Evidence review and scientific commentary

KEY JUDGEMENT

Preclinical evidence now supports a biologically plausible pro-metastatic role for high creatine availability in selected tumour and host-cell contexts. Human evidence, however, does not currently demonstrate that routine creatine supplementation increases cancer incidence, metastatic recurrence or cancer mortality.

José M. López, is an ex-Fellow of The American Association of Clinical Oncology (A.S.C.O.) and founding member of the Section of Biologic Therapy within the A.S.C.O.

This publication is designed for scientific communication and public information. It is not a substitute for individual medical advice.

AT A GLANCE

The shortest scientifically defensible interpretation

Creatine has not been shown to cause cancer in humans. The new 2026 evidence shows that high creatine availability can promote metastasis in several mouse models and can make human platelets more reactive after 20 g/day for 14 days. The missing link is decisive: no trial has yet demonstrated that creatine supplementation increases human metastatic recurrence or cancer mortality.

Question	Best current evidence	Confidence	What can be said now?
Does creatine cause cancer?	Human safety literature; no convincing carcinogenic signal	Moderate	No evidence that creatine monohydrate is a human carcinogen.
Can creatine promote metastasis?	Multiple mechanistic mouse studies across tumour models	Strong preclinical	Yes in selected experimental systems; human outcome relevance is unknown.
Does it alter human platelets?	11 healthy volunteers, 20 g/day for 14 days	Preliminary human	Yes: increased platelet reactivity was observed.
Is 3-5 g/day oncologically safe?	No adequately powered cancer-outcome study	Unknown	Not demonstrated to be harmful, but the specific metastatic question remains unanswered.
Can creatine enhance antitumour immunity?	CD8 T cells, macrophages and dendritic cells; mostly preclinical	Strong mechanistic	Yes in experimental systems, showing marked context dependence.

Evidence levels are qualitative and refer to the specific question, not to an overall “safety score”.

WHAT THE NEW STUDY DOES - AND DOES NOT - PROVE

SUPPORTED

- Creatine promoted metastasis in several mouse tumour models.
- The study identifies a megakaryocyte CKB-STAT5B pathway leading to hyperreactive platelets.
- 20 g/day for 14 days altered platelet reactivity in 11 healthy adults.

NOT ESTABLISHED

- Creatine causes malignant transformation or cancer initiation.
- 3-5 g/day increases human metastatic recurrence.
- Creatine worsens survival in cancer patients.
- All patients with cancer or previous cancer should stop creatine.

THE QUESTION MILLIONS OF PEOPLE ARE NOW ASKING

Creatine occupies an unusual position in modern nutrition. It is inexpensive, naturally present in the human body, found in ordinary foods such as meat and fish, supported by decades of sports-performance research, and consumed every day by competitive athletes, recreational gym users, older adults and people interested in healthy ageing.

It is therefore understandable that a headline linking creatine with cancer attracts attention. On 1 October 2026, the Spanish broadcaster Cadena SER discussed a recent study and asked whether creatine supplements might stimulate tumour cells. The report highlighted a genuine scientific signal, but public discussion quickly began to blur four very different questions: whether creatine causes cancer, whether it feeds cancer cells, whether it can promote metastasis, and whether experimental exposures resemble common supplementation practices.

Those questions are not interchangeable. Creatine is not a protein, an anabolic steroid or a mutagen. More importantly, carcinogenesis, primary-tumour growth and metastasis are biologically distinct processes. A factor may influence one without causing another.

The July 2026 study by Xie and colleagues in Nature Communications deserves serious attention because it identifies a previously unrecognised route through which exogenous creatine can alter megakaryocyte metabolism, increase platelet reactivity and facilitate metastasis in several experimental cancer models [1]. It also reports a small human mechanistic experiment in which 20 g/day of creatine monohydrate for 14 days increased platelet reactivity in healthy volunteers. What it does not provide is evidence that those volunteers developed cancer, metastatic disease or any oncological outcome.

The scientifically useful question is therefore not “Does creatine cause cancer?” but rather: Could increasing systemic creatine availability alter the behaviour of an existing tumour - particularly its ability to disseminate - in certain biological contexts? Preclinically, the answer is yes. Clinically in humans, we do not yet know.

MEDIA TAKEAWAY

“Creatine has been shown to promote metastasis in several animal models and to alter platelet function in a small human study” is defensible. “Creatine has been shown to cause cancer in people” is not.

1. CREATINE: MORE THAN A SPORTS SUPPLEMENT

Creatine is a nitrogen-containing organic compound synthesised primarily from arginine, glycine and methionine. Humans produce it endogenously and obtain additional creatine from food, particularly meat and fish. Its best-known function is to participate in the creatine-phosphocreatine energy-buffering system.

Creatine kinase transfers a high-energy phosphate between ATP and creatine. Phosphocreatine can then regenerate ATP rapidly when energetic demand rises. This is why creatine is valuable in skeletal muscle during repeated high-intensity effort, and why creatine monohydrate became one of the best-studied ergogenic supplements in sports nutrition [9].

The same chemistry is not confined to muscle. Immune cells, tumour cells, stromal cells and platelet-producing megakaryocytes also face rapid changes in energetic demand. This is the first conceptual step needed to understand the cancer literature: creatine is not intrinsically pro-cancer or anti-cancer. It is an energetic resource. The biological consequence depends on which cell captures it, the molecular programmes active in that cell, and the stage of disease.

2. CANCER INITIATION IS NOT THE SAME AS CANCER PROGRESSION

Cancer development can be simplified into a sequence: malignant transformation, primary-tumour expansion, local invasion, entry into the circulation, survival as circulating tumour cells, vascular arrest, extravasation and metastatic colonisation. These are mechanistically different steps.

The 2026 creatine study does not show that creatine damages DNA, transforms normal cells into malignant cells or increases cancer incidence. Its principal focus is later in the cascade: the capacity of pre-existing malignant cells to survive and colonise distant organs [1].

This distinction matters clinically. A substance need not be carcinogenic to modify the course of an existing malignancy. Conversely, demonstrating a pro-metastatic mechanism in animals does not establish that ordinary exposure causes clinically meaningful metastasis in humans.

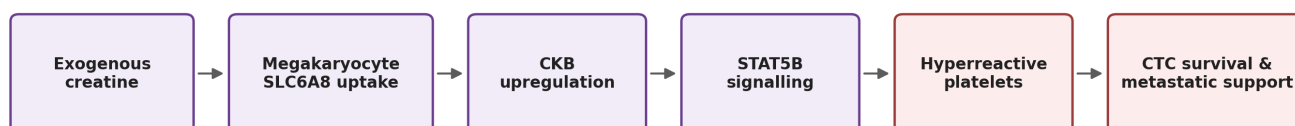
3. WHAT XIE *et al.* ACTUALLY FOUND

Xie and colleagues tested exogenous creatine in multiple mouse tumour systems, including melanoma, colorectal cancer, Lewis lung carcinoma and breast cancer. Across several models, creatine supplementation increased pulmonary metastatic burden. The authors then moved beyond phenomenology and asked which host compartment mediated the effect [1].

That step is important. A simplistic interpretation would be that creatine merely enters tumour cells and supplies additional energy. Instead, the experiments pointed strongly toward megakaryocytes and the platelets they generate.

Megakaryocytes are large haematopoietic cells, principally resident in bone marrow, that produce platelets. Platelets are central to haemostasis and thrombosis, but they are also biologically active partners in metastatic dissemination. Circulating tumour cells encounter mechanical stress, anoikis, immune attack and difficulty adhering to the vascular wall. Platelets can bind to tumour cells, protect them, alter immune recognition and facilitate vascular arrest and extravasation.

Mechanistic pathway proposed by Xie et al. (Nature Communications, 2026)



Strong preclinical causality | Human evidence currently limited to platelet phenotype, not cancer outcomes

Figure 1. Simplified mechanistic pathway proposed by Xie et al. [1]. The metastatic endpoint is demonstrated in animal models; the direct human finding is platelet hyperreactivity after supplementation.

4. THE CREATINE-SLC6A8-CKB-STAT5B AXIS

The investigators propose a sequential pathway in which exogenous creatine increases creatine availability to megakaryocytes via the creatine transporter SLC6A8. Intracellular creatine is associated with increased creatine kinase B (CKB), followed by a non-canonical phosphorylation programme involving STAT5B. Phosphoproteomic and transcriptional analyses identified downstream changes in platelet-function genes, including P2Y12-related signalling and glycoprotein VI pathways [1].

The causal argument was strengthened by genetic intervention. Megakaryocyte-specific deletion of *Slc6a8* or *Stat5b* suppressed creatine-associated platelet hyperreactivity and the resulting metastatic phenotype in mice. Pharmacological inhibition of STAT5 produced concordant effects. This does not prove clinical harm in humans, but it is far stronger mechanistic evidence than a simple observational association.

The key scientific advance is therefore not merely 'more metastases after creatine'. It is the identification of a host-cell metabolic circuit capable of changing platelet behaviour in a direction favourable to circulating tumour cells.

5. THE HUMAN EXPERIMENT: IMPORTANT, BUT SMALL

The study also included 11 healthy young adults who received 20 g/day of creatine monohydrate for 14 days [1]. The investigators measured blood creatine and platelet responses before and during supplementation. Platelet

counts did not simply rise; rather, platelet functional reactivity increased in several aggregation assays, with associated changes in platelet activation markers.

This is the most relevant translational bridge in the paper because it demonstrates that a creatine-induced platelet phenotype is not confined to mice. But the experiment remains a mechanistic physiology study, not an oncology trial.

No participant had cancer as the study endpoint. There was no assessment of cancer incidence, recurrence, progression-free survival, metastatic recurrence or cancer mortality. In a subsequent xenotransfer experiment, platelets collected after supplementation promoted greater metastatic burden when introduced into immunocompromised mice together with tumour cells. That is elegant translational biology; it is not evidence that creatine caused metastasis in the human donors.

6. THE DOSE QUESTION CANNOT BE IGNORED

Twenty grams per day is familiar in sports nutrition as a loading strategy, typically used for a short period before maintenance dosing. It is not the same exposure as taking 3-5 g/day chronically. The 2026 human experiment maintained the 20 g/day dose for two weeks [1].

That immediately exposes a major evidence gap. We do not know whether 3 g/day, 5 g/day or 10 g/day produces the same platelet phenotype. We do not know the threshold, the dose-response curve, the time course of reversibility after withdrawal, or whether the effect differs according to age, sex, diet, training status, cardiovascular phenotype, anti-platelet medication or cancer-associated hypercoagulability.

This is not a minor methodological detail. The practical significance of the finding depends heavily on whether platelet effects occur only at loading-level exposure or also at conventional maintenance intake.

Exposure context	Typical example	What is known about the 2026 platelet signal?
Loading protocol	~20 g/day for several days	Directly relevant: 20 g/day for 14 days was tested in 11 healthy volunteers.
Maintenance supplementation	~3-5 g/day	Not directly answered by the 2026 study.
Cancer-specific use	Variable; sometimes loading + maintenance in small RCTs	No clear harm signal in existing trials, but oncological endpoints were inadequately powered.

7. THIS SIGNAL DID NOT APPEAR FROM NOWHERE

7.1 Colorectal liver metastasis: extracellular energetic support

In 2015, Loo and colleagues reported in Cell that metastatic colorectal cancer cells could exploit CKB and the creatine-phosphocreatine system to improve energetic survival during liver colonisation [2]. Their work helped establish that tumour cells can externalise part of the phosphagen reaction, import phosphocreatine through SLC6A8 and use it to support ATP homeostasis under hostile metabolic conditions.

This study did not test over-the-counter supplementation, but it established an important principle: the creatine system can be co-opted by metastatic cancer biology.

7.2 Pancreatic cancer: mechanics, invasion and the phosphagen system

In 2020, Papalazarou and colleagues showed in Nature Metabolism that the stiff extracellular matrix characteristic of pancreatic ductal adenocarcinoma can reprogramme creatine metabolism. CKB acted as a mechanosensitive YAP target, and the creatine-phosphagen system supported invasive migration, actin dynamics, extracellular-matrix remodelling and metastatic dissemination [3].

Again, the conclusion was not that a dietary supplement causes pancreatic cancer. It was that malignant cells can make functional use of this energy-buffering circuit during invasion.

7.3 Dietary creatine and metastatic signalling

A 2021 Cell Metabolism study moved closer to the supplementation question. In colorectal and breast cancer models, creatine exposure promoted metastatic behaviour through an MPS1-SMAD2/3-Snail/Slug programme and was associated with poorer survival in the experimental animals [4].

This pathway differs from the megakaryocyte-platelet mechanism described in 2026. That distinction is scientifically important: two different experimental architectures - one centred on tumour-cell signalling and another on host platelet biology - converge on the same broad concern, namely that high creatine availability can facilitate metastasis in selected contexts.

8. THE PARADOX: CREATINE CAN ALSO STRENGTHEN ANTITUMOUR IMMUNITY

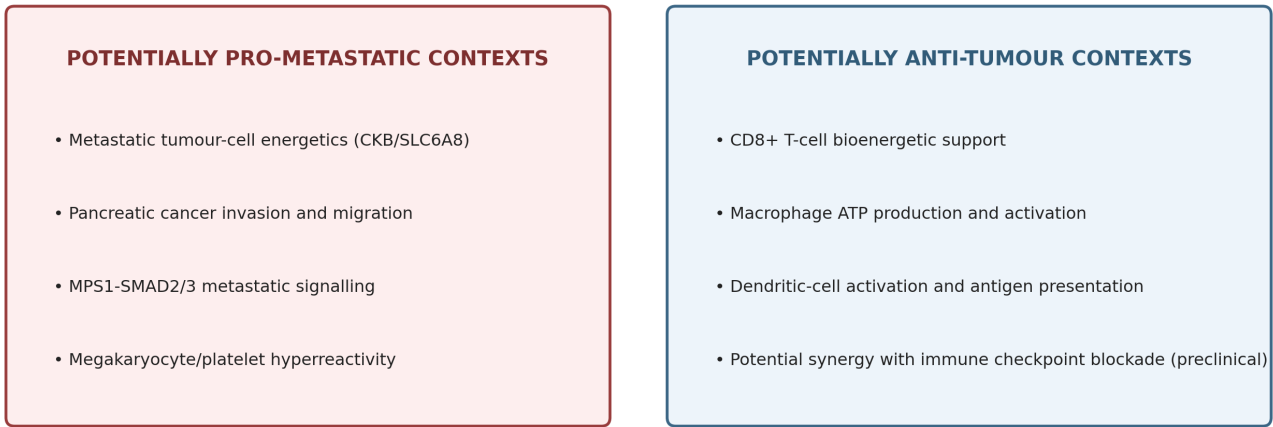
If the literature ended there, one might conclude that creatine is metabolically favourable to cancer. It does not. Some of the most compelling studies point in the opposite direction.

In 2019, Di Biase and colleagues showed that tumour-infiltrating CD8+ T cells upregulate the creatine transporter SLC6A8. Creatine uptake helped these highly active immune cells preserve bioenergetic capacity. In mouse tumour models, supplementation strengthened antitumour T-cell activity and enhanced the effect of PD-1/PD-L1 checkpoint blockade [5].

In 2023, Peng and Saito reported that creatine supplementation increased ATP production in macrophages, supported an inflammatory antitumour phenotype and improved tumour-antigen-specific CD8+ T-cell responses in a melanoma model [6].

In 2026, Kang and colleagues extended the concept to dendritic cells. Creatine uptake preserved ATP and improved dendritic-cell activation and antigen-presenting function. The work included human monocyte-derived dendritic cells, providing an additional translational signal, although cancer-outcome evidence remains preclinical [7].

CREATINE IN CANCER: A CONTEXT-DEPENDENT METABOLIC AMPLIFIER



The biological consequence depends on recipient cell, tumour phenotype, disease stage, dose and timing.

Figure 2. The apparent contradiction is resolved by cellular context: the same energy-buffering system can support both malignant and antitumour cellular programmes.

9. A BETTER MODEL: CREATINE AS A CONTEXT-DEPENDENT METABOLIC AMPLIFIER

The apparent contradiction is not evidence that the science is incoherent. It is evidence that tumours are ecosystems. Cancer cells coexist with fibroblasts, endothelial cells, platelets, macrophages, dendritic cells, natural killer cells, T lymphocytes and metabolically active stroma. These compartments compete for nutrients and energy while responding to very different signalling programmes.

Creatine can be conceptualised as a metabolic amplifier. It improves the ability of cells equipped with the appropriate transporters and kinases to buffer ATP demand. A skeletal-muscle fibre may use that capacity for contraction; a cytotoxic T cell may use it to kill cancer; a metastatic cell may use it to survive energetic stress; a megakaryocyte may use it to generate platelets with a pro-metastatic phenotype.

The clinically relevant equation is therefore not 'creatine = good' or 'creatine = bad'. It is: recipient cell + molecular phenotype + microenvironment + disease stage + dose + timing.

10. WHAT DO HUMAN CANCER TRIALS SHOW?

A 2026 systematic review and meta-analysis by de Moura Leite and colleagues identified five randomised controlled trials including 373 patients with cancer: 190 assigned to creatine and 183 to placebo [8]. Three trials involved non-metastatic disease and two included predominantly advanced cancer. Several regimens used a 20 g/day loading phase followed by 2-5 g/day maintenance. Intervention duration ranged from one to twelve weeks.

The pooled data did not show a significant improvement in lean mass, muscle strength or physical function. Fat mass was lower in the creatine groups, although the authors advised caution because of the small and heterogeneous evidence base. Importantly for safety, the trials reporting adverse events did not show a clear excess with creatine. Only one trial reported overall survival, with no detected difference [8].

This is reassuring but not definitive for the metastasis question. The trials were small, heterogeneous and short. Most were designed around muscle function, body composition or cachexia, not metastatic recurrence. They were not powered to detect moderate differences in progression-free survival, site-specific metastasis or cancer mortality.

The correct synthesis is therefore deliberately balanced: existing clinical trials have not demonstrated clear oncological harm, but they have not adequately excluded the specific risk raised by the mechanistic and animal literature.

HUMAN EVIDENCE - THE CRITICAL DISTINCTION

No current human trial demonstrates increased metastatic recurrence from creatine. No current human trial is sufficiently designed to rule it out with confidence.

11. DOES CREATINE “FEED” CANCER?

The phrase is rhetorically powerful and scientifically poor. Cancer cells use glucose, amino acids, lipids and oxygen; that fact alone does not mean patients should attempt to eliminate every metabolite used by malignant tissue.

The useful question is whether changing systemic availability of a particular nutrient causes a clinically meaningful change in tumour behaviour. For creatine, selected experimental systems say yes. Human outcome studies have not yet supplied the corresponding clinical answer.

A more precise formulation is: certain tumours and tumour-associated host cells can exploit creatine metabolism, and experimentally increasing creatine availability has promoted metastatic progression in several preclinical models.

12. DOES CREATINE CAUSE CANCER?

There is currently no convincing evidence that creatine monohydrate is a human carcinogen. An older concern involved theoretical formation of carcinogenic heterocyclic amines from creatine or creatinine. In a controlled human study, low- and high-dose creatine supplementation did not significantly increase the measured heterocyclic amines; diet appeared to account for the limited detections observed [10].

The modern oncology concern is therefore different from classical mutagenic carcinogenesis. It concerns whether creatine availability may alter progression and metastasis after malignant cells already exist. Conflating those questions produces unnecessary fear and poor science.

13. WHAT ABOUT THE BROADER SAFETY RECORD?

Creatine monohydrate remains one of the most extensively studied sports supplements. Long-standing reviews support its efficacy and general tolerability in studied populations [9]. More recent kidney-focused meta-analyses likewise show that supplementation may modestly increase serum creatinine while not producing a significant reduction in glomerular filtration rate, consistent with altered creatine/creatinine turnover rather than straightforward renal injury [11].

That evidence should not be discarded. But safety is endpoint-specific. A supplement can be renal-safe and still require investigation for another endpoint that older trials were never designed to detect. Demonstrating kidney safety does not answer metastatic safety in a patient with an occult or established malignancy.

14. LIMITATIONS THAT SHOULD PREVENT ALARMISM

Most oncological endpoints are animal endpoints. Mouse models are invaluable for mechanism, but they do not reproduce the full heterogeneity of human cancer.

Experimental metastasis can bypass natural disease steps. Intravenous tumour-cell models are particularly useful for studying circulation and colonisation but may bypass primary-tumour evolution.

The human sample is very small. Eleven healthy volunteers can reveal a physiological signal; they cannot estimate cancer risk.

Participants were young and healthy. Cancer populations often have older age, inflammation, hypercoagulability and treatment exposures that could modify the response.

The tested human dose was high. 20 g/day for 14 days does not answer the long-term effect of 3-5 g/day.

No human oncological endpoint was measured. There was no incidence, recurrence, progression, metastasis or cancer-specific mortality endpoint.

15. PRACTICAL IMPLICATIONS

15.1 Healthy adults using conventional doses

Current evidence does not justify telling healthy consumers that standard creatine supplementation causes cancer. Nor does the 2026 study establish that chronic 3-5 g/day dosing increases metastatic risk.

The rational response is not panic but research: conventional maintenance doses should now be tested specifically for platelet reactivity, dose-response, reversibility and interindividual variability.

15.2 People with active cancer

The risk-benefit equation is different in active malignancy. Cancer patients may have sarcopenia, cachexia, reduced strength and legitimate reasons for considering creatine. At the same time, the preclinical metastasis signal is now sufficiently coherent that unsupervised high-dose use should not be treated as automatically innocuous.

That is not equivalent to declaring a universal contraindication. It supports individualised discussion with the treating oncology team, particularly in metastatic disease, high thrombotic-risk states or when a tumour appears biologically dependent on creatine-phosphocreatine pathways.

15.3 Cancer survivors

Survivorship is not a single biological category. Someone cured of low-risk localised disease is not equivalent to a patient with molecular residual disease or a high recurrence risk. Future studies should stratify survivors by tumour type, stage, residual-disease status, treatment and time since remission rather than issuing blanket recommendations.

Population	What the evidence supports	Practical interpretation
Healthy adults	No demonstrated increase in human cancer incidence or metastasis from routine supplementation.	Do not infer carcinogenicity from this study; conventional-dose platelet studies are now warranted.
Active cancer	No clinical proof of harm; coherent preclinical metastasis mechanisms exist.	Avoid treating high-dose unsupervised use as automatically risk-free; discuss with oncology team.
Cancer survivors	Evidence insufficient for a universal rule.	Decision should reflect tumour type, recurrence risk, residual disease, treatment and expected functional benefit.
Sports-nutrition industry	Strong general safety literature does not answer every oncological endpoint.	Support independent dose-response and post-market translational research; avoid absolute claims.

16. THE RESEARCH PROGRAMME WE NOW NEED

Dose-response physiology: Randomised human studies comparing 0, 3, 5, 10 and 20 g/day, with plasma creatine, platelet aggregation, activation markers, P2Y₁₂/GP6-related readouts and thrombotic biomarkers.

Withdrawal and reversibility: Determine how rapidly the platelet phenotype returns to baseline after supplementation stops.

Tumour-specific prospective cohorts: Prioritise colorectal, breast, melanoma and pancreatic cancer, where creatine-related biology already has mechanistic support.

Molecular stratification: Measure SLC6A8, CKB, GATM, MPS1, SMAD2/3 and STAT5B rather than assuming all tumours respond similarly.

Liquid-biopsy integration: Use circulating tumour cells, ctDNA and molecular residual-disease measures to explore early signals before waiting for overt metastatic events.

Therapy interaction: Study creatine alongside immune checkpoint blockade, chemotherapy, targeted therapy and anti-platelet drugs; antitumour immune effects could make interactions non-intuitive.

17. WHY THIS MATTERS BEYOND CREATINE

The debate illustrates a broader problem in supplement and nutrition communication. A product can have genuine benefits, an extensive safety record and millions of users while still possessing biological effects that traditional safety programmes never specifically measured.

That does not mean earlier safety research was wrong. It means the scientific question has become more sophisticated. Twenty years ago, much of the public debate around creatine focused on dehydration or kidney damage. Today, investigators can interrogate immunometabolism, phosphoproteomics, platelet transcriptional programming and tumour-host metabolic interactions.

Good science should be allowed to update risk models without turning every new mechanism into a public-health emergency.

18. THE RESPONSIBILITY OF THE SPORTS-NUTRITION INDUSTRY AND THE MEDIA

Creatine is commercially important, which creates two symmetrical communication risks. The first is commercial denial: decades of general safety research are invoked as if they automatically invalidate any new concern. The second is sensationalism: an animal metastasis study is translated into 'creatine causes cancer'. Both positions are scientifically weak.

A mature response should support independent replication, investigate conventional maintenance doses, distinguish healthy populations from oncology populations, avoid unsupported anti-cancer or absolute-safety claims, and communicate uncertainty in proportion to evidence.

The media have a parallel responsibility. The public does not need every mechanistic signal diluted into 'nothing to worry about', but neither does it need a laboratory observation converted into a clinical diagnosis. Precision is not a barrier to impact. In health communication, precision is what makes impact trustworthy.

19. FIVE QUESTIONS TO ASK WHEN A SUPPLEMENT IS LINKED TO CANCER

- 1. Was the study performed in cells, animals or humans?** The experimental level determines how far the conclusion can travel.
- 2. Was cancer itself measured?** A biomarker or pathway is not the same thing as a clinical outcome.
- 3. Was the dose comparable with normal use?** Exposure determines relevance.
- 4. Has the finding been reproduced independently?** Convergent evidence matters more than a single paper.
- 5. What does the total evidence show?** New data should update, not erase, prior evidence.

20. FINAL PERSPECTIVE

Creatine has not suddenly become a carcinogen. The evidence does not justify that conclusion.

But something scientifically important has changed. We can no longer discuss creatine and cancer solely by pointing to its generally favourable sports-nutrition safety record. That record remains relevant, but it was not designed to answer every question now being raised by tumour metabolism and platelet biology.

We now know that the creatine-phosphocreatine system participates in several dimensions of cancer biology. Certain metastatic tumour cells can exploit it. Experimental creatine exposure can accelerate metastasis in several mouse models. Megakaryocyte creatine metabolism can generate platelets with a more metastasis-

supporting phenotype. And high-dose supplementation can alter platelet behaviour in healthy humans over a short period [1].

At the same time, creatine can strengthen CD8+ T cells, macrophages and dendritic cells that participate in antitumour immunity [5-7]. The real story is therefore not that creatine is pro-cancer or anti-cancer. It is that creatine sits at the intersection of energy metabolism, immunity, haemostasis and tumour progression.

For healthy people using conventional doses, current evidence does not justify fear. For people with active cancer, especially those considering high-dose supplementation without clinical supervision, the accumulated mechanistic evidence now justifies a more cautious and individualised discussion. For researchers, the priority is obvious: determine whether the biological signals seen in mice and platelets translate into human oncological outcomes.

Until those data exist, the most scientifically defensible position is neither reassurance at any cost nor alarm at any cost. It is precision, proportionality and intellectual honesty.

THE BOTTOM LINE

Creatine does not currently meet the evidentiary threshold for a human cancer warning. It now clearly meets the threshold for targeted oncological research.

REFERENCES

1. Xie S, Chen R, Sun X, et al. Exogenous creatine supplementation promotes tumor metastasis via megakaryocyte creatine kinase B-STAT5B signaling. *Nature Communications*. 2026;17:8662. doi:10.1038/s41467-026-74639-z.
2. Loo JM, Scherl A, Nguyen A, et al. Extracellular metabolic energetics can promote cancer progression. *Cell*. 2015;160(3):393-406. doi:10.1016/j.cell.2014.12.018.
3. Papalazarou V, Zhang T, Paul NR, et al. The creatine-phosphagen system is mechanoresponsive in pancreatic adenocarcinoma and fuels invasion and metastasis. *Nature Metabolism*. 2020;2:62-80. doi:10.1038/s42255-019-0159-z.
4. Zhang L, Zhu Z, Yan H, et al. Creatine promotes cancer metastasis through activation of Smad2/3. *Cell Metabolism*. 2021;33(6):1111-1123.e4. doi:10.1016/j.cmet.2021.03.009.
5. Di Biase S, Ma X, Wang X, et al. Creatine uptake regulates CD8 T cell antitumor immunity. *Journal of Experimental Medicine*. 2019;216(12):2869-2882. doi:10.1084/jem.20182044.
6. Peng Z, Saito S. Creatine supplementation enhances anti-tumor immunity by promoting adenosine triphosphate production in macrophages. *Frontiers in Immunology*. 2023;14:1176956. doi:10.3389/fimmu.2023.1176956.
7. Kang E, Elsten-Brown J, Wang Y-C, et al. Creatine uptake promotes dendritic cell activation and enhances antitumor immunity. *iScience*. 2026;29:115436. doi:10.1016/j.isci.2026.115436.
8. de Moura Leite L, Brito HC, Nohmi RL, et al. Creatine Supplementation in Patients With Cancer: A Systematic Review and Meta-Analysis. *JCSM Communications*. 2026;9:e70044. doi:10.1002/rco2.70044.
9. Kreider RB, Kalman DS, Antonio J, et al. International Society of Sports Nutrition position stand: safety and efficacy of creatine supplementation in exercise, sport, and medicine. *Journal of the International Society of Sports Nutrition*. 2017;14:18. doi:10.1186/s12970-017-0173-z.
10. Pereira RTS, Dörr FA, Pinto E, et al. Can creatine supplementation form carcinogenic heterocyclic amines in humans? *Journal of Physiology*. 2015;593(17):3959-3971. doi:10.1113/JP270861.
11. Kabiri Naeini E, Eskandari M, Mortazavi M, Gholaminejad A, Karevan N. Effect of creatine supplementation on kidney function: a systematic review and meta-analysis. *BMC Nephrology*. 2025;26:622. doi:10.1186/s12882-025-04558-6.
12. Cadena SER. “Esto no lo habían previsto en ningún gimnasio”: un estudio chino analiza si los suplementos de creatina estimulan las células tumorales. 1 October 2026. Accessed 1 October 2026.

EDITORIAL NOTE

Evidence reviewed through 1st October 2026. This article intentionally distinguishes established human findings, animal evidence, mechanistic plausibility and research hypotheses.

No part of this publication should be interpreted as an individual recommendation to start, continue or discontinue creatine supplementation during cancer treatment. Decisions in active cancer should be individualised with the treating clinical team.

INTABIOTECH Knowledge Center

© 2026 INTABIOTECH. All rights reserved.

Original scientific analysis.

Reproduction, distribution or commercial exploitation requires appropriate authorisation and attribution.