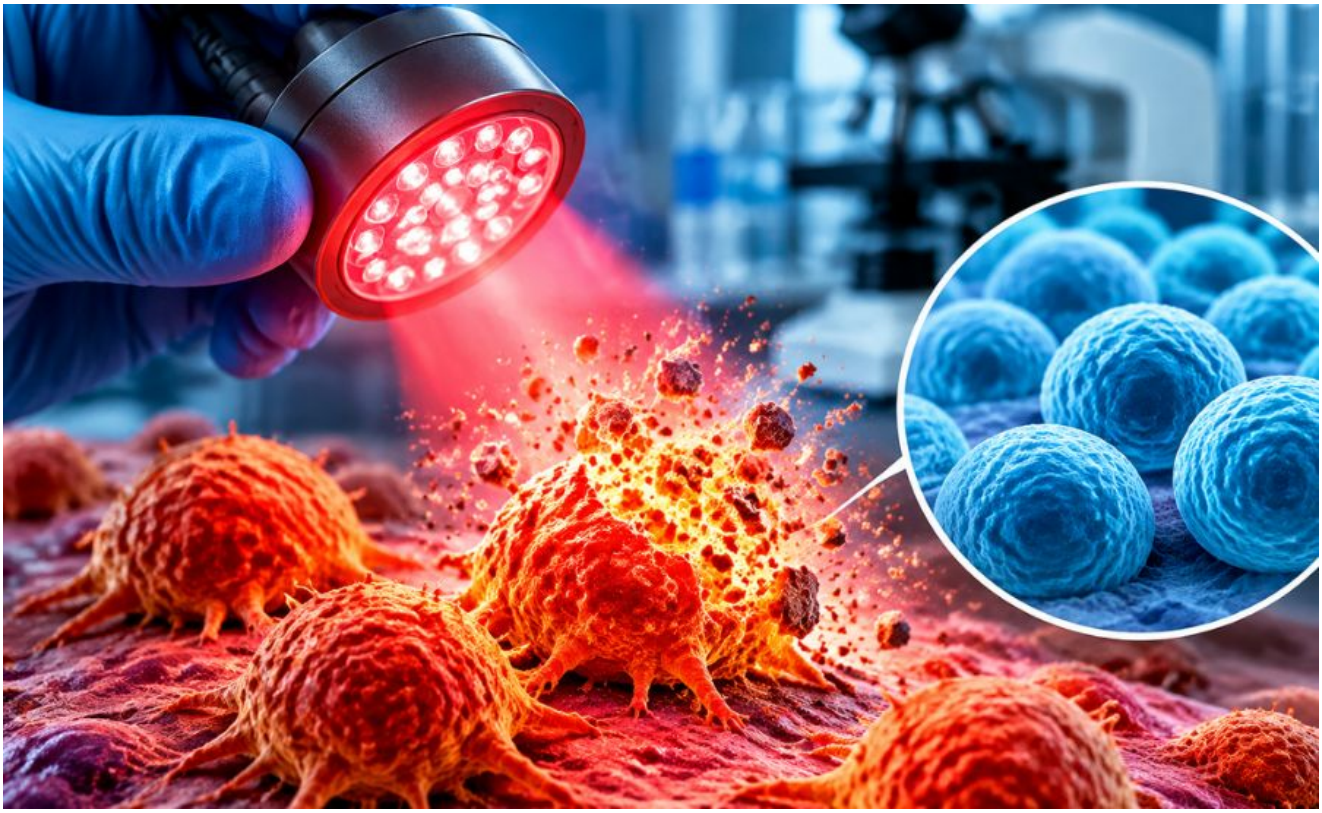
HOME

Scientists Use LED Light to Kill 92% of Cancer Cells Without Harming Healthy Cells

By bestfolkmedicine · 21/10/2026 · 11 min read



Researchers in the United States and Portugal have developed an experimental light-based technology that destroyed up to 92% of certain skin cancer cells in laboratory testing while leaving healthy skin cells unharmed. Could this become a safer, more affordable cancer treatment?

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Imagine a future where certain cancers could be treated with a precisely directed beam of light instead of relying exclusively on surgery, chemotherapy, or radiation.

No large, expensive laser system. No powerful beam burning surrounding tissue. Just carefully controlled LED light and microscopic materials designed to transform that light into cancer-destroying heat.

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It may sound futuristic, but scientists have already demonstrated an early version of this technology in the laboratory.

In a remarkable study published in September 2025 in the scientific journal ACS Nano, researchers from the University of Texas at Austin and the University of Porto in Portugal reported encouraging results from an experimental cancer treatment combining near-infrared LED light with ultra-thin tin-based nanoparticles.

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After just 30 minutes of treatment, the combination reduced the viability of skin cancer cells by up to 92% and colorectal cancer cells by approximately 50%.

Even more intriguing, healthy human skin cells showed no significant toxic effects under the tested laboratory conditions.

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The findings could open a new direction in cancer treatment, although the technology has not yet been established as safe or effective in human patients.

A Remarkable Discovery: Using Light Instead of Conventional Cancer Drugs

One of the greatest challenges in cancer medicine is destroying malignant cells without unnecessarily damaging healthy tissue.

Cancer cells originate from the body's own cells, which makes selective treatment particularly difficult.

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Chemotherapy drugs often interfere with processes involved in rapid cell division. Although they can be highly effective, they may also affect healthy tissues.

Radiation therapy can target tumors more precisely, but nearby healthy structures may still receive some radiation exposure.

Scientists have therefore spent decades investigating ways to make cancer treatment increasingly selective.

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One promising field is known as photothermal therapy.

Instead of using traditional anticancer drugs to destroy tumor cells, photothermal therapy converts light energy into heat.

That heat can damage cancer cells when it is delivered at an appropriate intensity and location.

The challenge has been finding materials and equipment capable of generating enough heat to kill malignant cells without causing unnecessary injury to surrounding tissues.

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The new research offers a potential solution.

How Does the New LED Cancer Treatment Work?

The experimental method combines two essential components: near-infrared LED light and microscopic tin oxide flakes.

Neither component should be confused with an ordinary household LED bulb or a commercial red-light therapy device.

Step 1: Scientists Create Ultra-Thin Tin Nanoflakes

Researchers developed special tin-based materials known as SnOx nanoflakes.

These tiny structures measure less than 20 nanometers in thickness.

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For perspective, a nanometer is one-billionth of a meter.

Their extremely small size and unique chemical structure allow them to interact with near-infrared light in ways that ordinary materials cannot.

Step 2: Near-Infrared LED Light Activates the Material

The research team used near-infrared LED light with a wavelength of approximately 810 nanometers.

This type of light is outside the visible range of the human eye.

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When the light reaches the prepared nanoflakes, the material absorbs its energy.

Step 3: Light Energy Is Converted Into Heat

The nanoflakes transform absorbed light energy into thermal energy.

This process is known as the photothermal effect.

Under carefully controlled laboratory conditions, the resulting temperature increase can damage nearby cancer cells.

Step 4: Cancer Cell Viability Decreases

Researchers exposed different cultured cell types to the nanoflakes and LED light.

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They observed substantial reductions in cancer cell survival while healthy human skin fibroblasts remained largely unaffected under the tested conditions.

This suggests that the combination of material properties, light exposure, and cellular responses may support selective cancer treatment.

However, researchers still need to establish how reliably this selectivity can be achieved inside living human tissues.

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The Results: 92% of Skin Cancer Cells Affected in Just 30 Minutes

The research team’s findings attracted attention because of the substantial differences observed between malignant and healthy cells.

LABORATORY RESULTS AFTER 30 MINUTES

92%

Skin cancer cells

Reduction in viability

50%

Colorectal cancer cells

Reduction in viability

Healthy human skin fibroblasts showed no detectable cytotoxicity under the reported test conditions.These results came from experiments on cultured cells—not human cancer patients.

The researchers tested the technology on A431 skin carcinoma cells and SW837 colorectal cancer cells.

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Both cell types demonstrated responses to the experimental treatment, although the degree of sensitivity differed considerably.

These findings are encouraging because they show that photothermal effects can be generated using an LED system rather than relying exclusively on powerful lasers.

But the percentages describe reductions in cell viability during controlled laboratory experiments. They do not mean that 92% of tumors would disappear in patients or that the treatment has a 92% clinical cure rate.

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Why Is Protecting Healthy Cells So Important?

Cancer treatment is often a delicate balance between eliminating malignant cells and preserving healthy tissue.

Some effective treatments cause difficult side effects because they also influence normal biological processes.

These effects can include fatigue, nausea, skin reactions, inflammation, and other complications, depending on the treatment.

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A technology capable of delivering destructive energy more selectively could potentially reduce certain treatment-related complications.

The LED and nanoflake approach is particularly interesting because healthy skin fibroblasts did not show significant toxicity in the laboratory experiments.

However, the human body contains numerous cell types and complex structures.

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Researchers must still determine how the technology affects blood vessels, nerves, immune cells, connective tissues, and healthy organs under real treatment conditions.

Promising laboratory selectivity is an important first step, but it is not proof that a treatment will have no side effects in humans.

Why LED Light Could Make Cancer Treatment More Affordable

Conventional experimental photothermal therapy often relies on laser equipment.

Depending on the application, medical laser systems can be expensive and require specialized infrastructure.

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LEDs offer several potential advantages.

They can be relatively inexpensive to manufacture, consume less energy, and be incorporated into portable devices.

LED systems may also provide more distributed illumination than tightly focused laser beams.

This could eventually make certain light-based treatment technologies more accessible.

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The research team developed a custom LED system specifically for the experiments.

Importantly, affordability alone does not determine whether a medical device is suitable for clinical use.

Future treatment costs would also depend on nanoparticle production, safety testing, medical supervision, device certification, and clinical effectiveness.

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Nevertheless, using LEDs instead of specialized lasers could simplify some aspects of treatment development.

Could This Technology Eventually Treat Skin Cancer at Home?

One of the most intriguing possibilities discussed by the researchers involves portable medical devices.

Their long-term vision includes developing light-based systems that could potentially be used outside major hospitals.

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For some skin cancers, researchers envision devices that might one day be applied following surgery to target residual malignant cells.

Such technology could potentially reduce the need for certain complex procedures if future studies establish its safety and effectiveness.

But this remains a research goal, not an available treatment.

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There are important challenges to solve before home use could ever become practical.

Scientists must determine how the nanoflakes would be delivered, how deeply the light penetrates tissue, how accurately treatment can be controlled, and whether all malignant cells receive an adequate dose.

They must also investigate whether particles remain in the body, how they are cleared, and whether repeated exposure causes long-term harm.

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Until these questions have been answered through rigorous clinical research, LED cancer treatment should remain within appropriate experimental and medical settings.

Could LED Therapy Work Against Other Types of Cancer?

The initial experiments focused on skin carcinoma and colorectal cancer cell lines.

The results suggest that different cancers may respond differently to the same treatment.

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This is not surprising.

Cancer is not a single disease. Different tumor types can vary dramatically in metabolism, genetic mutations, physical structure, and sensitivity to environmental conditions.

Researchers are exploring various forms of light-based cancer therapy for several malignancies.

However, extending the results of this particular LED-nanoflake technology to breast, lung, prostate, brain, or other cancers would require separate investigations.

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Another major limitation involves tissue depth.

Near-infrared light can penetrate biological tissue more effectively than some visible wavelengths, but its penetration is still limited.

Deeply located tumors may require different delivery strategies.

This means that a method suitable for superficial cancer cells may not automatically work against tumors located deep inside the body.

How Is This Different From Red-Light Therapy?

This distinction is particularly important because light-based wellness treatments have become increasingly popular.

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You may have seen advertisements for red-light panels, infrared devices, or LED masks promising benefits for the skin, inflammation, or cellular health.

The experimental cancer treatment described here is fundamentally different.

It relies on a specific combination of engineered tin oxide nanoflakes and controlled near-infrared LED exposure.

Light alone was not the entire treatment. The nanoflakes were a crucial part of the experimental system.

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Ordinary LED lamps, red-light therapy panels, and cosmetic light devices should not be assumed to produce the same anticancer effects.

There is no scientific justification for attempting to treat suspected or diagnosed cancer using consumer LED devices based on these findings.

Doing so could delay effective medical care.

What Still Needs to Happen Before Patients Can Benefit?

Although the results are exciting, the technology remains at an early research stage.

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Several important questions must be answered before any potential clinical application.

1. Does it work in living tumors? Cancer cells growing in a laboratory dish behave differently from tumors surrounded by blood vessels, immune cells, and other tissue structures.

2. Can researchers deliver the nanoflakes safely? Scientists need to establish how the material reaches the desired location and whether it causes unintended effects elsewhere in the body.

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3. What happens after repeated exposure? The materials demonstrated stability during repeated irradiation experiments, but long-term biological safety remains uncertain.

4. Can it prevent cancer recurrence? Destroying cultured cancer cells does not establish that the technology can eliminate entire tumors or prevent cancer from returning.

5. Will it work in human clinical trials? Controlled clinical studies would be necessary to determine dosing, effectiveness, possible complications, and appropriate patient populations.

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These steps are essential before a promising laboratory discovery can become an accepted medical treatment.

A Growing Field: Light-Based Cancer Research

The LED-nanoflake study forms part of a wider scientific effort to create more precise cancer therapies.

Researchers are investigating several approaches that use light to activate localized biological or chemical effects.

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Some technologies use photosensitive compounds that become active under specific wavelengths.

Others use nanoparticles to convert light into heat.

Still others aim to influence cancer cell signaling or stimulate antitumor immune responses.

Each approach has distinct mechanisms, limitations, and stages of development.

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The common objective is to increase the precision of treatment while reducing unnecessary damage to healthy cells.

This does not mean light-based therapies will replace chemotherapy, radiation, immunotherapy, or surgery.

Instead, future technologies may potentially complement established treatments or provide additional options for selected patients.

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The Bigger Picture: Could Cancer Treatment Become More Precise and Less Invasive?

Over recent decades, cancer care has made important advances through targeted therapies, immunotherapy, improved imaging, and more accurate radiation techniques.

The emerging LED research reflects the same broader scientific objective: treating cancer with greater precision.

By integrating nanotechnology with inexpensive light-emitting devices, researchers are exploring an approach that could eventually be less invasive and more accessible for certain applications.

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Still, the road from laboratory research to patient treatment can be long.

Many experimental cancer therapies that perform well in cultured cells do not achieve the same results in animal studies or human clinical trials.

That uncertainty should not diminish the importance of early discoveries.

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Instead, it highlights why scientific progress requires careful testing, independent confirmation, and transparent reporting.

Final Thoughts: A Promising Discovery, Not Yet a Cancer Cure

The collaboration between scientists in Texas and Portugal has produced encouraging results.

Using specially engineered tin oxide nanoflakes activated by near-infrared LED light, researchers reduced the viability of up to 92% of skin cancer cells and approximately 50% of colorectal cancer

cells in laboratory experiments.

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Healthy human skin cells showed no significant damage under the tested conditions.

These findings demonstrate the potential of combining nanotechnology with controlled light exposure to develop more selective cancer treatments.

But it is important to remember that this remains experimental research, not a proven cure or an approved clinical therapy.

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If future investigations confirm its effectiveness and safety, this technology could contribute to a new generation of more precise cancer treatments.

The most exciting possibility isn't simply that light can destroy cancer cells. It's that scientists are learning how to direct that destructive power more selectively while preserving healthy tissue.

And that could make an important difference in the future of cancer medicine.

ezstandalone.cmd.push(function () { ezstandalone.showAds(164); });
Would you feel comfortable with a light-based cancer treatment if clinical trials eventually proved it was safe and effective? Share your thoughts in the comments.

Read online: https://bestfolkmedicine.com/2026/10/led-light-kills-cancer-cells-spares-healthy-cells/
Downloaded on 22/11/2026

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