Study: Sunscreen provides little cancer defense

By Sue Vorenberg
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Using sunscreen as armor against the deadliest form of skin cancer is a bit like wearing chain mail to a gunfight, a new study at the University of New Mexico suggests.

Sunscreen protects against attacks from some kinds of sunlight, but other kinds can go right through like a carcinogenic bullet.

A UNM study published last month has narrowed down the types of sunlight most likely to cause melanoma skin cancer - and they aren't the types generally stopped by sunscreen, said Graham Timmins, a pharmacy professor and researcher at the University of New Mexico.

"Sunscreens are funny," Timmins said. "If you look at the bottle, they don't actually claim that they protect against skin cancer."

Timmins' research was published in the March 14 issue of the Proceedings of the National Academy of Sciences.

Sunscreen protects against ultraviolet light in the wavelength range known as UVB. That light generally causes less-deadly nonmelanoma cancers, Timmins said.

Sunscreen doesn't generally protect against ultraviolet light in the range known as UVA. And it looks like that type of light is one of the primary culprits that causes melanoma skin cancer, Timmins said.

Each year, more than 1 million cases of nonmelanoma skin cancer and about 59,600 cases of melanoma skin cancer are discovered in the United States. Most of the skin cancer-related deaths - 7,800 out of 10,600 each year - result from melanoma, according to the American Cancer Society.

In the study, Timmins and other researchers from UNM, Texas State University and Brookhaven National Laboratory tested how a specific type of fish responded to different wavelengths of ultraviolet light.

The fish, a hybrid species bred at the Xiphophorus Genetic Stock Center at Texas State, are prone to skin cancer and are frequently used in cancer research, said Ron Walter, a professor of cancer research at Texas State and director of the fish-breeding center.

"Although they don't look like us, fish are biologically similar enough to us that we can use them to understand how some of these cancers work," Walter said.

Timmins and other UNM researchers exposed the fish to different wavelengths of ultraviolet light and found the fish were more likely to develop melanoma skin cancer from UVA light than from other types, Timmins said.

"This fish is the only animal in which somebody's actually measured the wavelengths and how it responds to each wavelength," Timmins said.

Light wavelengths in the visual spectrum range from 700 to 400 nanometers. UVB light ranges from 290 to 320 nanometers.

UVA light comes in right between them, at 320 to 400 nanometers, and that is the spectrum the fish reacted to, Timmins said.

It looks like those wavelengths turn melanin - the chemical that controls skin pigment - into something like a Trojan horse, Timmins said.

Light from UVA wavelengths can penetrate melanin and damage it, which causes it to release free radicals - hidden biological warriors - that attack skin-cell DNA, "and once you get that, that's cancer," Timmins said.

The research could lead to better sunscreens in the future protecting against both types of skin cancer, he said.

So far, sunscreens are rated only for how well they protect against UVB light and related cancers, Timmins said.

"You can have a really high SPF sunscreen, but that doesn't help against UVA," Timmins said.

Sun-protection factor measures the time it takes skin to redden from UVB light. It tells nothing about UVA light, he said.

A small number of sunscreens include certain chemicals that protect against some UVA light, but the protection factors are harder to measure, Timmins said.

Those chemicals include avobenzone, zinc oxide and titanium dioxide, Timmins said.

"Of course the best advice is to wear a hat, wear a long-sleeved shirt in summer" and stay out of the sun, he said.

The next step in the research will be to study how different wavelengths affect an animal with skin more similar to humans. Some types of opossum will probably be ideal, Timmins said.