

Blue light used to harden tooth fillings stunts tumor growth

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Alpesh Patel, a rising MCG School of Dentistry junior, studies the effects of a blue curing light on tumors. Credit: Phil Jones

A blue curing light used to harden dental fillings also may stunt tumor growth, Medical College of Georgia researchers say.

"The light sends wavelengths of blue-violet light to the composite, which triggers hardening," says Alpesh Patel, a rising MCG School of Dentistry junior. "The light waves produce free radicals that activate the catalyst and speed up polymerization of the composite resin. In oral cancer cells,

though, those radicals cause damage that decreases cell growth and increases cell death."

Mr. Patel, who has been working with Dr. Jill Lewis, associate professor of oral biology, Dr. Regina Messer, associate professor of oral rehabilitation and oral biology, and Dr. John Wataha, adjunct professor of oral rehabilitation and oral biology, studied 10 tumor-bearing mice, five treated with the light and five untreated.

He exposed half the mice to the blue light for 90 seconds a day for 12 days. Then the tumors were extracted and each one was split into two sections. Half were used to create slides for tissue analysis, and half were frozen to prepare protein extracts.

Tissue analysis indicated an approximate 10 percent increase in cell suicide, or apoptosis, in the light-treated tumors. The frozen protein extracts revealed a nearly 80 percent decrease in cell growth in the light-treated tumors.

"The decrease in cell growth, combined with increased apoptosis, helps explain why the tumors didn't grow as much because you have cells that aren't dividing and you have cells that are committing suicide," Mr. Patel says.

Dr. Lewis predicts treating the tumors with blue light sooner will increase the rate of apoptosis, possibly preventing the tumor from ever becoming measurable and easing treatment.

"One desirable feature we've observed with the blue light is that non-cancerous cells appear unaffected at light doses that kill tumor cells," says Dr. Lewis. "We're thinking that some day, blue light therapy may serve as an adjunct to conventional cancer therapy. Patients may, therefore, receive lower doses of chemotherapy, which would decrease

the adverse effects most cancer patients experience from standard chemotherapy regimens."

Source: Medical College of Georgia

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