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Small peptide found to stop lung cancer tumor growth in mice

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In new animal research done by investigators at Wake Forest University School of Medicine, scientists have discovered a treatment effective in mice at blocking the growth and shrinking the size of lung cancer tumors, one of the leading causes of cancer death in the world.

The study, recently published in *Molecular Cancer Therapeutics,* a journal of the American Association for Cancer Research, is the first to show that treatment with a specific peptide, angiotensin-(1-7), reduces lung tumor growth by inhibiting blood vessel formation.

"If you're diagnosed with lung cancer today, you've got a 15 percent chance of surviving five years - and that's just devastating," said co-lead investigator Patricia E. Gallagher, Ph.D., director of the Molecular Biology Core Laboratory in the Hypertension and Vascular Research Center at the School of Medicine. "Those other 85 people - 85 percent - they're not going to see their kids graduate. They're not going to see their children get married."

The lung cancer survival rate has changed little in the past 30 years, said Gallagher's co-lead investigator, E. Ann Tallant, Ph.D., a professor in the Hypertension and Vascular Research Center - a fact that motivates them in their research.

Peptides, found in all animals, are compounds formed by linking one or more amino acids together through the sharing of electrons. They are among the building blocks of life. Peptides can perform a wide range of

functions in the body, depending on which amino acids are involved. Some can regulate hormones, for example, while others can have an antibiotic function.

Angiotensin-(1-7) is a small peptide that binds to proteins on the surface of cells and prevents cell growth - but only if the cell is actively growing when the binding occurs. That property is what led Tallant and Gallagher to explore the peptide's uses for treating cancer by blocking tumor growth.

Angiotensin-(1-7) works by inhibiting the production of signals sent out by a cancer tumor for food. For tumors to grow, they need nutrients delivered by blood vessels. The signals they send prompt blood vessels to grow and invade the tumor to feed it.

Every day during the six-week study, researchers injected either saline or the angiotensin (1-7) peptide into mice growing human lung cancer tumors. Over the course of the study, the tumors treated with angiotensin-(1-7) shrunk, while the saline-treated tumors grew and, at the end of the study, the tumors treated with angiotensin-(1-7) weighed about 60 percent less than the tumors treated with saline. Analysis also showed that the tumors from mice treated with the peptide had significantly fewer blood vessels compared to the tumors from the saline-treated animals.

The researchers further tested angiotensin (1-7)'s affect on blood vessel formation, or angiogenesis, by treating chick embryos with the peptide - a procedure considered the gold standard for determining anti-angiogenic ability. They found that blood vessels continued to grow in a saline-injected control group, while blood vessel formation decreased by more than 50 percent in the embryos treated with angiotensin-(1-7).

Tallant and Gallagher said the treatment likely has applications beyond

lung cancer - they have collected data showing it is effective on breast, colon and brain tumors, as well.

The treatment also presents an attractive possibility for future human cancer therapy from a cost perspective, they said.

"Because it's a peptide, it's very small and can be made very easily," Gallagher said. "We sometimes like to say we're the aspirin of cancer therapy."

Source: Wake Forest University Baptist Medical Center (news : web)