

Antifungal drug stops blood vessel growth

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Researchers at Johns Hopkins have discovered to their surprise that a drug commonly used to treat toenail fungus can also block angiogenesis, the growth of new blood vessels commonly seen in cancers. The drug, itraconazole, already is FDA approved for human use, which may fast-track its availability as an antiangiogenesis drug.

In mice induced to have excess blood vessel growth, treatment with itraconazole reduced blood vessel growth by 67 percent compared to placebo. “We were surprised, to say the least, that itraconazole popped up as a potential blocker of angiogenesis,” says Jun O. Liu, Ph.D., professor of pharmacology. “We couldn’t have predicted that an antifungal drug would have such a role.”

In their search for antiangiogenesis drugs, the researchers worked with cells from human umbilical cords, a rich source of blood vessels, and exposed them to 2,400 existing drugs - including FDA- and foreign-approved drugs, as well as nonapproved drugs that had passed safety trials - to see which ones could stop the cells from dividing.

“The best outcome was to find an already approved drug that worked, and the fact that we did was very satisfying,” says Liu, whose study appears online in ACS Chemical Biology.

As an antifungal drug, itraconazole blocks a key enzyme for making fungal cholesterol, causing these primitive life forms to become fragile and break apart. It turns out that itraconazole can block the same enzyme in blood vessels, but the researchers aren’t positive if that’s the reason

blood vessels stop growing, because related antifungal drugs had much lower inhibitory effect.

“Our screening test did show that cholesterol-lowering statins also appear to stop blood vessel growth,” Liu says, “so there is likely some important connection between cholesterol and angiogenesis.”

While the researchers still must tease out exactly how itraconazole works to stop vessel growth, and test it in animals with cancer, they have high hopes for its use. “Itraconazole can be taken orally for fungal infection, and therefore oral delivery may work for angiogenesis as well,” Liu notes.

Source: Johns Hopkins Medical Institutions

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