

Meet...

Andrew Combs

MEDICINAL CHEMIST, *Wilmington, Delaware*



BORN IN

Argentina, Newfoundland, Canada. Then we moved to Maryland, and I grew up in Wisconsin. My dad was in the Navy.

JOB SITE

Incyte Corporation

ALTERNATE CAREER CHOICES

I thought I was going to be an artist and a doctor.

HOBBIES

Being outdoors: boating, wakeboarding, hiking, fishing, hunting and gardening.

RECENT VACATIONS

Scuba diving with my family at Little Cayman Island, seeing all the cool creatures.

What He's Doing

It's a story straight out of "When Enzymes Go Wild." Essential enzymes in the body called kinases sound an alarm when a stimulus comes knocking at a cell's door. The kinase's signal tells the nucleus to react by dividing, laying low or sending out chemicals. But sometimes the process goes awry: kinases keep signaling, telling cells to divide and divide and divide when they shouldn't. Those out-of-control cells may tell other cells around them to start dividing, too. Suddenly you have a cancer.

Enter Andrew Combs. An executive director at a biomedical company, he runs a program that designs molecules to calm down those overexcited kinases. By slowing cell division, he hopes to treat human cancers.

Combs started college as an art and pre-med major, but he soon realized that he couldn't squeeze in art studios with all of his science labs and math classes. Eventually, he ended up in chemistry. But his artistic abilities have stayed with him. Organic chemistry is an art form in itself, he says. You have to be able to draw molecules in two dimensions and see them in three. Combs has a knack for picturing and rotating molecules in his head to help examine their shapes and see if they may be the right ones for the job.

"It's exciting and rewarding to be a chemist working in a field where your research can possibly help so many people. I can't think of a career I would rather do."

His Findings

Combs' team designed a molecule, now entering human testing, that affects the body's levels of the amino acid tryptophan. Although it's most famous for making you sleepy after your Thanksgiving turkey, tryptophan also maintains your immune system. Some cancers sneakily evade an immune system attack by lowering levels of tryptophan in the area. They do it by turning on an enzyme called IDO that helps break down tryptophan. When tryptophan levels drop in the neighborhood, the immune system weakens in that spot, and the cancer proliferates. So Combs' molecule turns IDO off again, allowing your immune system to spring back and go after the tumor cells.

This drug could become a treatment for a variety of human cancers in which IDO is on overdrive, including ovarian, breast, prostate and colon cancers. It would be an especially important medicine since cancer patients with high IDO activity tend to have faster-growing cancers and worse outcomes.

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