



# Chemist with a Cause

**David G. Hangauer '74, PhD, takes aim at cancer with a drug that targets its most lethal cells.**

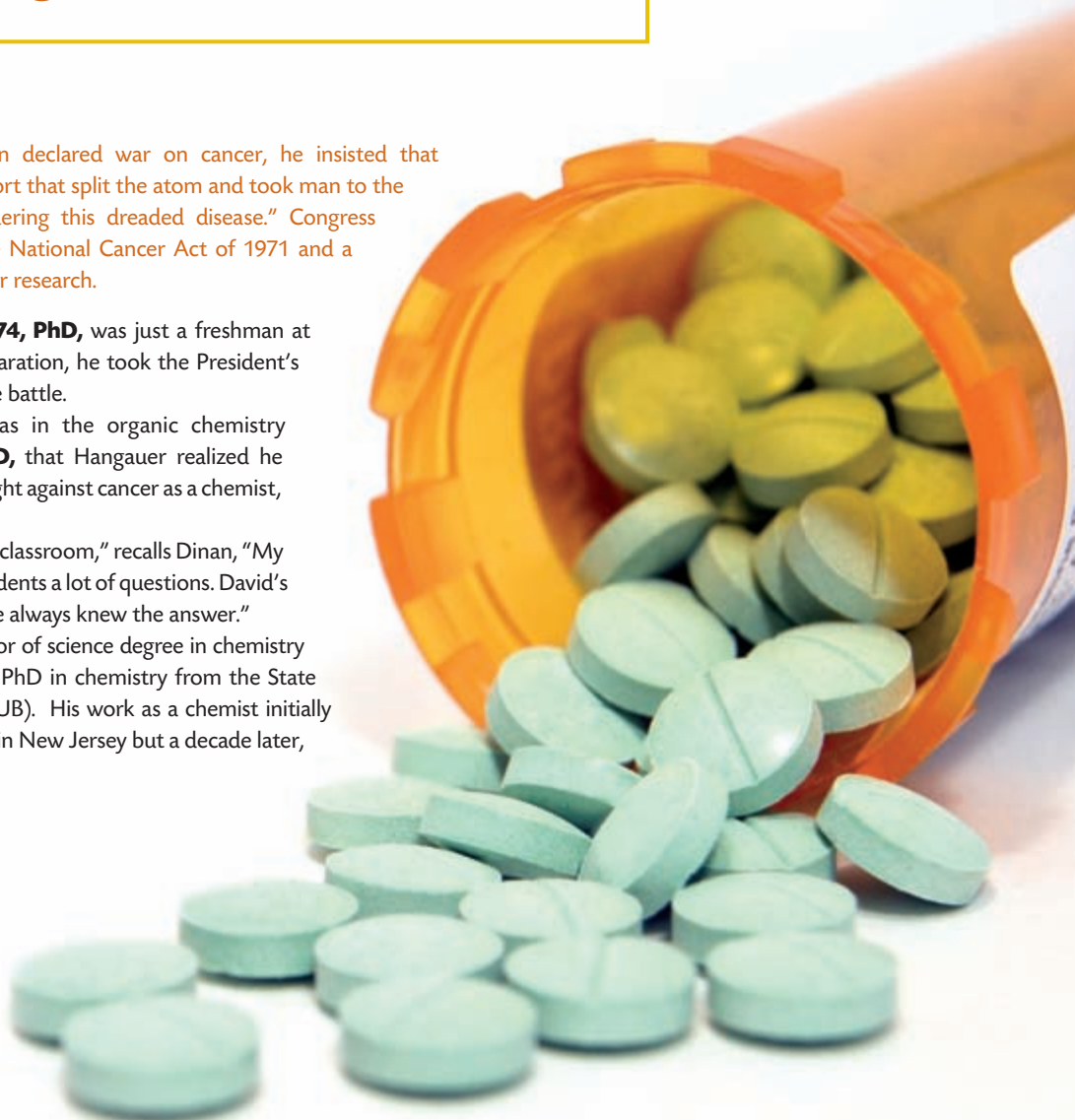
When President Richard M. Nixon declared war on cancer, he insisted that “The same kind of concentrated effort that split the atom and took man to the moon should be turned to conquering this dreaded disease.” Congress responded with the passage of The National Cancer Act of 1971 and a \$100 million appropriation for cancer research.

Although **David G. Hangauer '74, PhD**, was just a freshman at Canisius when Nixon made his declaration, he took the President’s words to heart and signed up for the battle.

Initially a pre-med major, it was in the organic chemistry classroom of **Frank J. Dinan, PhD**, that Hangauer realized he could contribute even more to the fight against cancer as a chemist, rather than as a physician.

“David sat right in the front of the classroom,” recalls Dinan, “My teaching style involves asking the students a lot of questions. David’s hand was constantly up in the air. He always knew the answer.”

After Hangauer earned his bachelor of science degree in chemistry at Canisius, he went on to earn his PhD in chemistry from the State University of New York at Buffalo (UB). His work as a chemist initially took him to Merck Pharmaceuticals in New Jersey but a decade later, Hangauer returned to Buffalo.



Now, an associate professor of medicinal chemistry at UB, he is also a pharmaceutical consultant and is engaged in several impressive drug developments. Hangauer was a founding scientist and key scientific advisory board member for a Swiss company that recently developed an antibiotic to combat Methicillin-resistant *Staphylococcus aureus*, also known as MRSA, or the "superbug." It should hit the market this year. An insomnia drug he invented is also in worldwide Phase II trials with Eli Lilly. Hangauer also is the lead developer of KX2-391, an anti-cancer drug that shows enormous potential.

Manufactured by Kinex Pharmaceuticals LLP, a company Hangauer co-founded, KX2-391 is in Phase I of human clinical trials at Roswell Park Cancer Institute in Buffalo, NY and MD Anderson Medical Center in Houston, TX. The people in the clinical trials have advanced cancer and have not responded to traditional therapies. For them, Hangauer's drug may be the answer to their prayers.

"The advantages of KX2-391 are that it creates fewer side effects than other similar drugs, it inhibits primary tumor growth and blocks the spread of cancer, which kills 90 percent of patients," says Hangauer.

"It has been very effective in mouse and cell culture models, and worked on all of the different cancers we examined," adds Irwin H. Gelman, PhD, vice chair and associate member of the Department of Cancer Genetics at Roswell Park Cancer Institute.

KX2-391 is the first in its class of drugs to progress to the clinical stage. It is also the first to target a specific site on Src (pronounced "sark") kinase, a protein that is linked to the survival of cancer cells. This target strategy greatly reduces the chance that patients will develop resistance.

"David is an expert in the kinase inhibitor technology and has distinguished himself in the design of drugs that are structure-based," says **Robert J. Genco '04, DDS, PhD**, vice provost and director of science, technology transfer and economic outreach for the State



<< David G. Hangauer '74, PhD, works in the lab at Kinex Pharmaceuticals located at 701 Ellicott Street in Buffalo.

University of New York at Buffalo. "He is a visionary who thinks in terms of how his knowledge will benefit society."

Hangauer also has very personal reasons to want KX2-391 to succeed.

"My father died five years ago from lung cancer, and several other people close to me have died from cancer," says Hangauer. "I have seen firsthand how this disease devastates people. Even if the drug works half as well in patients as it did in the pre-clinical trials, it would be wonderful."

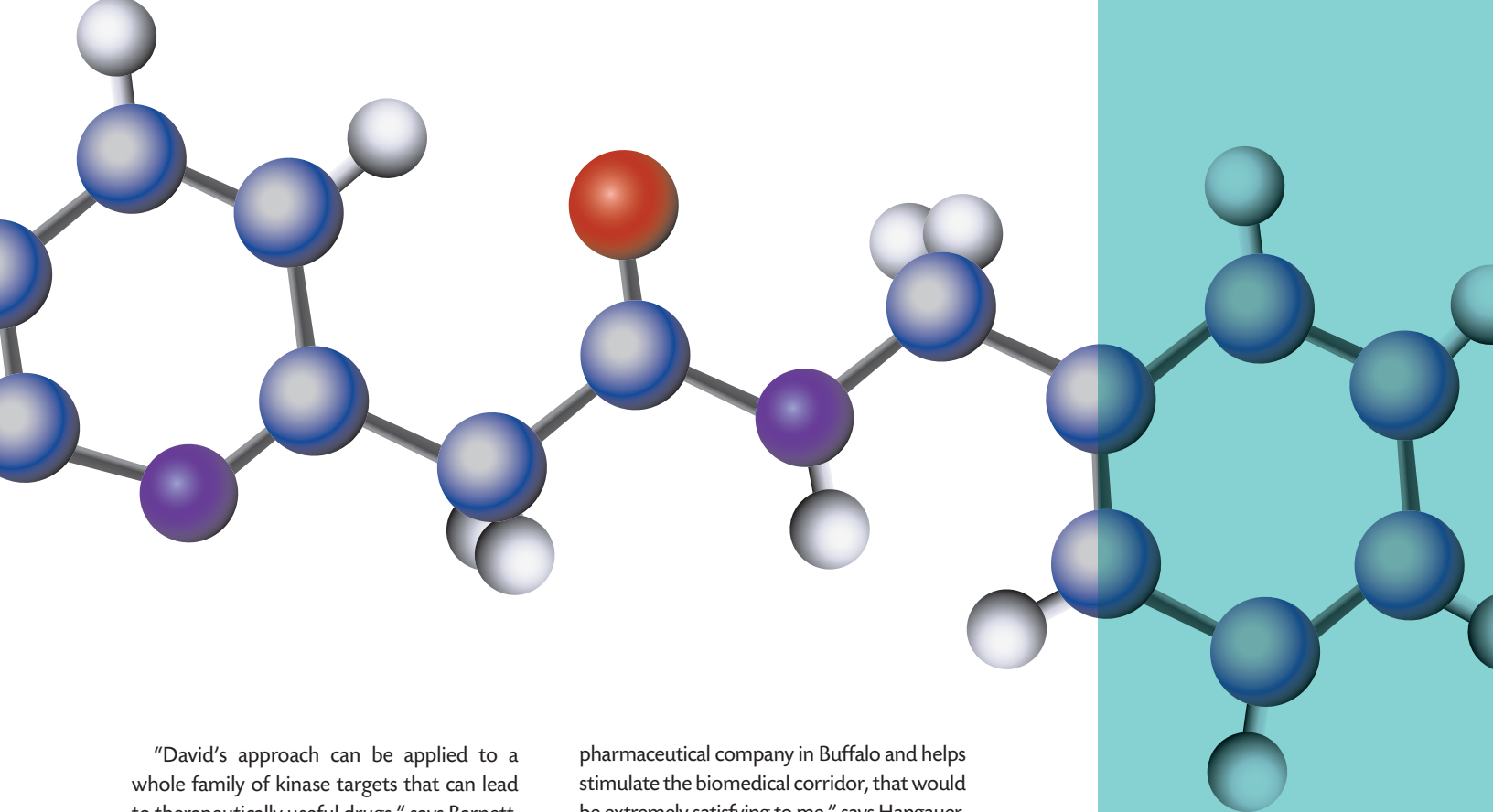
Hangauer laid the groundwork for KX2-391 during his time in drug discovery at Merck, where he was exposed to new sciences and cutting-edge technologies. One of the first medicinal chemists to synthesize compounds in the laboratory and utilize computer-aided drug discovery, Hangauer applied his expertise to such high-profile projects as Vasotec, a high-blood pressure drug. But it was the potential of his extensive research on kinases that motivated Hangauer.

"In the 1980s, kinase research was brand new," recalls Hangauer. "Today, there is a huge global effort to find drugs to inhibit various kinases."

When Merck shut down its kinase inhibitor project, Hangauer "jumped at the chance to return to my hometown and reinstate a program on kinase inhibitors."

By the early 2000s, Hangauer's kinase research outgrew the laboratory and reached the drug development phase. That is when he decided to form his own company. The university filed a patent for Hangauer's research and then licensed it exclusively to Kinex (the name is derived from the word "kinase"), located in Buffalo's biomedical corridor.

Hangauer recruited major players from the pharmaceutical industry to Kinex, including former Schering-Plough executive Allen Barnett, PhD, who is Kinex's CEO. With 30-plus years experience, Barnett developed the well-known allergy drug Claritin, which currently generates \$3.5 billion dollars a year for Schering-Plough.



“David’s approach can be applied to a whole family of kinase targets that can lead to therapeutically useful drugs,” says Barnett. “After a while in the field, you develop an eye for things that you think will pay off down the line.”

When Phase I of the KX2-391 clinical trials are complete, Kinex will license the drug to a larger pharmaceutical company for Phase II. This will provide Kinex with a steady stream of income, and enable it to expand and invent new drugs. Medications for osteoporosis, arthritis and hearing loss are already in the works.

The success of KX2-391 could be a boost to Buffalo’s biomedical corridor and ultimately contribute to the economic revitalization of the entire region. According to Barnett, Buffalo is not yet considered a hot-spot for biotech discoveries like Boston and San Diego. He notes that venture capitalists did not want Kinex located in Buffalo but the partners weren’t dissuaded.

“This location is ideal, being one block from Roswell Park Cancer Institute and within The New York State Center of Excellence in Bioinformatics & Life Sciences. All four partners have strong ties to this area, so our loyalty has been built up,” says Barnett.

Kinex, which has already outgrown its current facility in the Center for Excellence in Bioinformatics and Life Sciences, is considering a move to a new, larger facility – possibly the former Trico Building.

“If Kinex goes on to become a substantial

pharmaceutical company in Buffalo and helps stimulate the biomedical corridor, that would be extremely satisfying to me,” says Hangauer.

It would be equally satisfying to Canisius, which will convert the former BlueCross BlueShield building on Main Street into an interdisciplinary science center.

“One of the big advantages when you provide the proper level of interdisciplinary training is that students will know how their work relates to other specialties, and how it may be combined or cross-fertilized to produce results that could not previously be obtained working only in their own specialty,” explains Hangauer, whose research activities combine several areas aside from chemistry.

A loyal alumnus of Canisius, Hangauer’s ties to *alma mater* were strengthened in 2006, when the college’s Chemistry Department honored him with its Dr. James H. Crowdle Medal. The award is bestowed periodically to an alumnus/ae who has distinguished him or herself in the fields of chemistry or biochemistry. And although Hangauer is a recipient of several prestigious awards, he says the Crowdle Medal was particularly rewarding because the recipient is chosen by Canisius chemistry students. The same students, he notes, who will one day use their Canisius educations to forge new discoveries and feed Western New York’s scientific pipeline, much like he has done.

“My number one goal is to make a difference and I believe I can do that with drug discovery,” says Hangauer. ■

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