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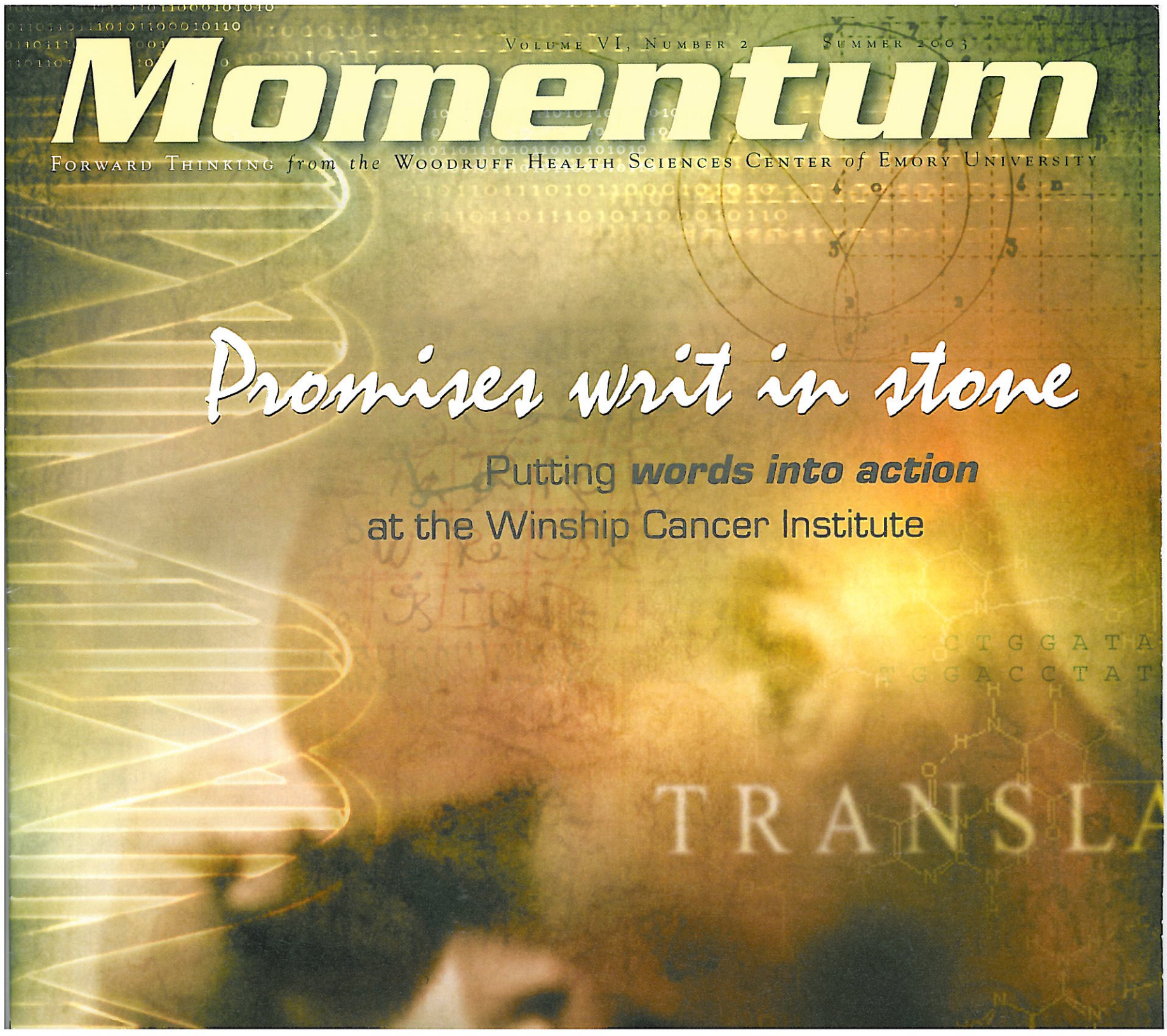
Momentum

FORWARD THINKING *from the* WOODRUFF HEALTH SCIENCES CENTER *of* EMORY UNIVERSITY

Promises writ in stone

Putting ***words into action*** at the Winship Cancer Institute



ientists go beyond the basics

ELAND CHUNG was quite a catch for Emory. An internationally renowned urologist, prostate can-earcher, and molecular biologist, he aps best known for his investiga-f the interplay between cancer and roenvironment—the cellular environ-round the cancer, the normal tissue a tumor that supports its growth.

ıg and WCI director **JONATHAN SIMONS** cently awarded the largest, federally three-year award for prostate cancer ı in history. With the $10 million grant e US Department of Defense, they will ı a consortium of 13 universities to seek erapeutic molecular targets and con-ır treating advanced prostate cancer. ough Chung focuses primarily on e cancer, his line of investigation applies ally any kind of cancer—an interdisci-way of thinking that marks the new phy of the WCI.

current technology in cancer treatment y focused on cancer cells," he says. rrow-minded. Cancer is a disease that s an intimate cell-cell communication. not grow in a vacuum. It grows in a imensional organization alongside other f cells—fibroblastic, muscle, endothelial, natory, and nerve cells. The cancer cells stantly in touch with the cells around them (stroma). They attach themselves onto things, and because of their interactions with the immune system, they're constantly being stressed out, constantly interacting with the body. The cancer and the stroma are moving targets constantly undergoing change."

Chung is always seeking innovative ways to conduct experiments that closely resemble what happens in the human body. Last winter, he sent prostate tumor cells on board the ill-fated shuttle Columbia, to grow metastatic prostate cells in a three-dimensional, gravity-free environment, with bone stroma mimicking the growth environment of prostate cancer metastasis in the human body.

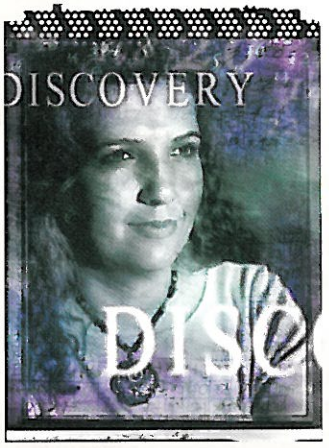
His quest to unravel the interplay between cancer and its growth environment could lend a much broader understanding of metastasis—the molecular biology of cancer progression. Understanding why cancer progresses so quickly in some people and more slowly in others could help target more individualized—and more effective—treatments. "By comparing what happens on a molecular level with both the cancer and the stroma at given points in disease progression, we define the differences between patients who die quickly and those who don't," he says. This knowledge could lead to new drugs that target both cancer cells and their surrounding environment to make it more difficult for cancer to spread.

Many other WCI scientists are breaking new ground in basic science discovery, all while keeping cancer patients foremost in their minds. **PARASKEVI GIANNAKAKOU** has identified a novel association between the tumor suppressor protein p53 and the cell's structure (cytoskeleton). Chemotherapy drugs that affect the cytoskeleton of cancer cells also affect the function of the p53 protein by altering its location within the cell. Her findings give new insight into the mechanism of drugs that target the cytoskeleton.

"We are learning a lot of basic science about the cellular pathways of genetic damage and how they relate to death, aging, and cancer," says biochemist and radiation oncologist **PAUL DOETSCH**, interim head of basic sciences for WCI. For years he has done basic research on systems that repair genetic damage within a cell, including damage that can lead to cancer. His lab discovered a protein produced by African beer yeast that seems to recognize and kick off the repair process for many kinds of genetic damage, including radiation from chemotherapy, ultraviolet light, and normal cell metabolism. He patented the protein and now has a grant from Emtech, a biotechnology incubator formed through a partnership of Emory and Georgia Tech, to develop applications for it. "Developing ways to use this new knowledge to help mankind—that's the best kind of science there is," he says.

Like Doetsch, **ANDREW KARELLAS** cares deeply about improving the lot of cancer patients. The medical physicist works closely with **CARL D'ORSI**, program director for oncologic imaging at WCI and director of breast imaging, to make mammography and other imaging technologies more sensitive by creating high-resolution, three-dimensional images. Their work is a prime example of a basic scientist teaming with a clinician to help patients more quickly.

Chung, like so many WCI scientists and clinicians, keeps real patients in mind while conducting research. **"Scientists can stay inside their labs all day, make their discoveries solely for the benefit of 'science,' and never talk to anybody else," Chung says. "But if their discoveries never make a difference for a real human being, what's the point?"**



"I CAME TO EMORY BECAUSE INTERDISCIPLINARY WORK IS SO IMPORTANT HERE," SAYS PARASKEVI GIANNAKAKOU. "DRUG DISCOVERY IS SO IMPORTANT FOR CANCER PATIENTS, AND HERE WE HAVE EVERYONE WORKING TOGETHER—CELL BIOLOGISTS, PHARMACOLOGISTS, AND CLINICIANS. WE HAVE GREAT POTENTIAL FOR COMING UP WITH SOME NOVEL DRUGS WITH GREAT SPEED."