The ART *of*

SCIENCE

Curated by CAROL SQUIRES

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International Center of Photography

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Excerpt from Exhibition Catalogue

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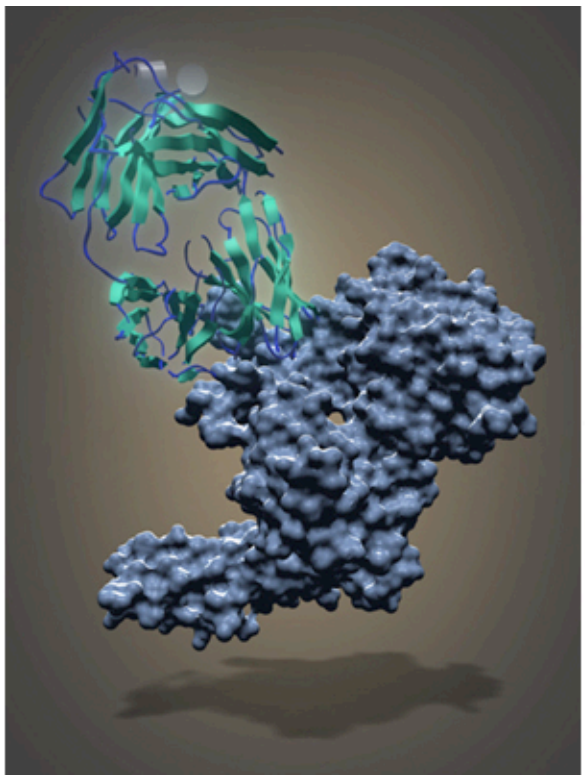


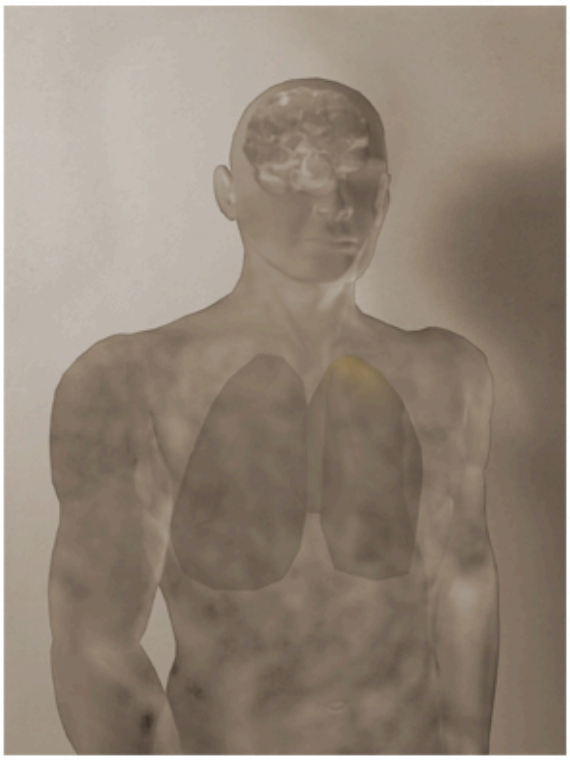
Ellen Sandor, Keith Miller, (art)^{n}, with Matthew Franklin, Department of Protein Engineering, Genentech, Inc., *Omnitarg: Hope*, 2003. PHSCologram composed of Duratrans, Kodalith film, Plexiglas, 40x30 inches. Courtesy of Ellen Sandor and (art)^{n}

Science in the twenty-first century is increasingly driven by astonishing methods of visualization. Whether the subject is the surface of Mars or the interior of a human cell, scientists look at images not so much as documentation but as sites of discovery. Images capture life systems as they unfold, enabling scientists to learn how cells are structured, how embryos develop, or how the human brain thinks.

This revolution has occurred in large part because of the computer, which has had a profound effect on scientific imaging of the body since the early 1970s. With it, scientists can capture electronic signals from an array of different instruments. Some scan the interior of the human body as a series of slices, and the computer converts those signals into pictures for video screen display. Those devices, such as the MRI (magnetic resonance imaging) and PET (positron emission tomography), allow doctors and scientists to peer deeply into the human body without doing surgery, and even to watch the living body and the brain at work. With new quantum dot technology, researchers can make digital time-lapse movies that show the moment DNA transcription begins in a new life.

The images in this exhibition were made to understand how human and animal biology functions and how and why it goes wrong. All were created in digital form and with a few exceptions are projected as digital files. They represent a small sampling of the enormous range of awe-inspiring scientific visualization. Yet, while they are fueling important scientific discoveries, such images and techniques raise significant issues as well. Primary among them is the disquieting fact that all of life, including our genetic code, can be reduced to pixels and processed as data. As science rushes ahead to its remarkable discoveries, we continue to probe the impact of the computer on the very core of our humanity.

The VIRTUAL HUMAN



Ellen Sandor, Keith Miller, Janine Fron, Jack Ludden, (art)^{n} with Jim Strommer, School of Medicine, University of California, Los Angeles. *PET Study 2 (Lung Cancer): Man Ray/Picabia*, 2003. PHSCologram composed of Duratrans, Kodalith film, Plexiglas, 40x30 inches. Courtesey of Ellen Sandor and (art)^{n}

Ellen Sandor, Keith Miller, Janine Fron, Jack Ludden and other members of (art)^{n} are a group of artists who have been collaborating with scientists since 1983 to create works in the computer that merge art with science. For the piece *PET Study 2 (Lung Cancer): Man Ray/Picabia*, 2003, they chose to model their virtual sculpture on a 1923 portrait photograph that Man Ray took of the painter Francis Picabia. Next they took a PET scan of lung cancer made at UCLA's School of Medicine with Dr. Jim Strommer, digitally colored and sculpted it, and inserted it into a digitized, three-dimensional model of the lungs. Then they mapped that onto the

virtual sculpture, and rendered the entire image as a series of sixty-four separate images, each from a slightly different perspective. When the final image is viewed through a backlit barrier screen, the viewer perceives it as existing in three dimensions.

The manner in which $(art)^n$ builds up the multiple layers of the sculpture echoes in reverse the way that scanning technologies deconstruct the body as a series of planes. For positron emission tomography, or PET scans, which allow scientists to explore disease at the molecular level in a living patient, a subject is injected with a tracer labeled with short-lived, radioactive pharmaceuticals. The isotope-tagged material moves through the body, giving off particles called positrons during radioactive decay.

When they collide with electrons, they produce photons. The photons give off signals that are picked up by the PET scanner, which is a ring of electronic detectors that surrounds the body. The resulting signals are fed into a computer, which reconstructs them as a picture sequence of planes cut through the body.

But by using the Picabia portrait, $(art)^n$ also pointedly includes a third concept about the layering and reproduction of the human form. In the photograph, the bare-chested artist is said to be imitating the virile posture of Auguste Rodin's sculpture, *Monument to Balzac* (1897-98), a massive portrait of the famed French novelist. The portrait photographer Nadar wrote in a memoir that Balzac was afraid to have his picture taken because he believed that "all physical bodies are made up entirely of layers of ghostlike images, an infinite number of leaflike skins laid on top of the other." Balzac also thought that man was incapable of "creating something from nothing [and]

. . . concluded that every time someone had his photograph taken, one of the spectral layers was removed from the body and transferred to the photograph." What one was giving up was "the very essence of life."[1]

Although Balzac misperceived the way a photographic image is made, his fear can be seen as a prescient vision of scientific capabilities. Millions of ghostlike layered images have been taken in the name of science. They reside in laboratories and doctor's offices around the globe. Although they have been made for the purpose of preserving, rather than giving up the "essence of life," it is humbling to know how closely we can inspect life's origins and inner workings.

CAROL SQUIRES, *Curator*

[1] See Nadar, "My Life as a Photographer," trans. Thomas Repensek, October, no. 5 (Summer 1978): 9.