

## Xenon injects images with brightness

Breathed as an anesthetic, the inert gas xenon gives patients a light-headed feeling similar to that of laughing gas. Since the 1980s, researchers have been exploring another use for inhaled xenon—enhancing the capacity of magnetic resonance imaging (MRI) to obtain detailed pictures of the lungs and the brain.

Conventional MRI creates anatomical pictures by detecting protons, which reside mainly in a tissue's water molecules. Xenon also generates a distinct MRI signal, but as it travels through the bloodstream, it becomes too diffuse to yield useful images.

Now, scientists report that an injection of xenon can deliver high concentrations of the gas to parts of the body far from the lungs. An injection localizes the gas in a particular organ, which can then be scanned using MRI, says Alexander Pines of the Lawrence Berkeley (Calif.) National Laboratory and the University of California, Berkeley.

Pines, Thomas F. Budinger of the University of California, San Francisco, Gil Navon of Tel Aviv University in Israel, and their colleagues report the findings in the Dec. 23, 1997 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES.

"It's a very nice study," says Scott D. Swanson of the University of Michigan in Ann Arbor, who is developing brain imaging techniques using inhaled xenon. Physicians may someday choose inhalation or injection, depending on which organs they want to see, he says.

Using a technique called optical pumping (SN: 7/30/94, p. 70), Pines and his colleagues hyperpolarized the xenon nuclei, aligning their spins and thereby enhancing their MRI signal. The scientists then dissolved the treated xenon in a solvent compatible with the tissues to be imaged. Once dissolved, the xenon spins begin to fall out of alignment. In their experiment, the researchers had less than a minute to inject the solution into the hind legs of rats and detect the circulating xenon.

Pines and his team are also delving into whether the treated xenon can transfer its polarization to other molecules in the body (SN: 5/4/96, p. 282). If it can, hyperpolarized xenon could enhance a variety of conventional MRI images.

—C. Wu