

What if ... an inhaled contrast agent could map a broad range of relevant lung characteristics without ionizing radiation?

PROJECT STATUS

Second generation polarizer assembled and tested in 2009

Spin-up rates of 20% per hour with 50 liter batches meet or exceed the world's highest

HeliBox-Z100 third generation system is being assembled with high-power narrow-band laser pumping to explore the limits of helium-3 polarization

INTELLECTUAL PROPERTY

Patent awarded on laser technology

Exclusive rights licensed from University of New Hampshire

Worldwide patent coverage

COMMERCIAL POTENTIAL

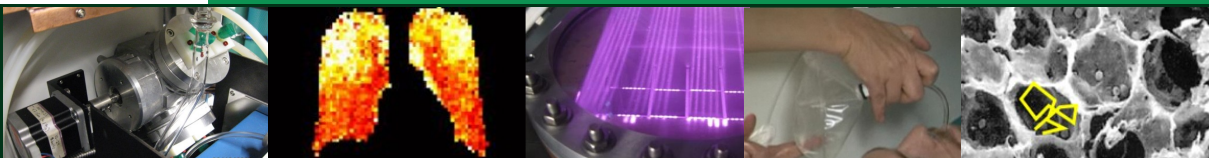
Pharmaceutical companies validating new medical therapies in clinical trials, can use MagniLium MRI as a Drug Development Tool

National neutron scattering labs rely on large-scale helium-3 polarization for neutron polarization analysis

National electron scattering labs utilize polarized helium-3 as a target for probing quark structure of nature

For further information:

F. William Hersman, PhD
President and CEO
P: 603-868-1888
E: hersman@xemed.com

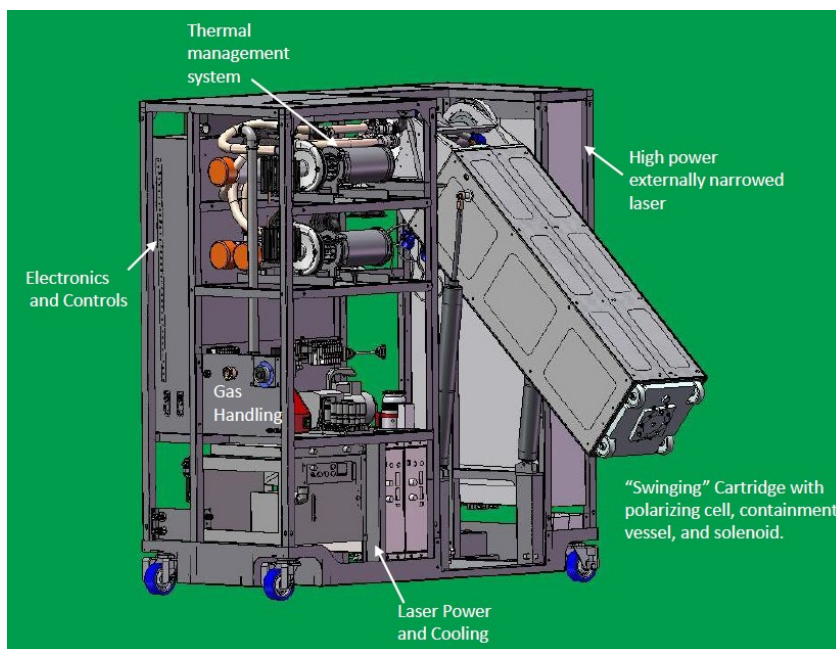


Almost fifteen years of research effort at two dozen clinical research sites in North America and Europe have revealed numerous beneficial applications of pulmonary functional imaging with hyperpolarized noble gases. The vast majority of those pilot studies were conducted with hyperpolarized helium-3, a scarce resource. As hyperpolarized noble gas MRI increasingly becomes clinically and commercially valuable, the imaging community must transition to xenon-129, which is abundant and affordable. In the meantime, however, there is an ongoing need for helium-3 hyperpolarization capability that is portable, automated, and reliable, particularly for large-scale institutional or commercial users.

Xemed has developed a large-scale system for production of hyperpolarized helium-3. The HeliBox-Z100 is capable of polarizing up to 100 liters per day, and is capable of achieving the highest theoretical polarizations attainable with Spin Exchange Optical Pumping. At its core, the HeliBox-Z100 consists of an eleven liter, fully blown, monolithic aluminosilicate cell, thermally stabilized by a flowing oil heat exchanger, which is mounted inside a pressure vessel. The pressure inside the glass cell can be raised to several atmospheres and precisely balanced with the same pressure outside the cell. A hybrid alkali mixture of potassium and rubidium allows high polarization efficiencies at temperatures up to 240°C.

Our second generation prototype system was assembled and tested in 2009. Spin-up rates around 20% per hour for batches exceeding 50 liters were measured with several test cells blown from both borosilicate and aluminosilicate using a 2 kW broadband diode laser system.

Our third generation system, HeliBox-Z100, presently being assembled, will be illuminated by a 2.5 kW spectrally narrowed laser that provides a line width under 0.3 nm. Furthermore, the third generation system will be robust, compact, and automated.



The HeliBox-Z100 system will provide a hybrid alkali mixture of potassium and rubidium, stabilized at 240°C by a flowing oil system, illuminated with 2.5kW narrow-band laser light to polarize up to 50 liters of helium-3.