

## Technologies

The **Photonic Molecular Probe® (PMP)** identifies and measures the concentration of a target molecule(s) within a mixed specimen. The PMP uses a specially prepared beam of light and detects multiple physical property changes to the beam of light as it is affected by target molecule(s). Additionally, the PMP uses an extremely sophisticated proprietary signal processing technique, to include Bayesian - based Methodology developed for and used by NASA and the Department of Defense. The PMP has many applications including: noninvasive blood glucose monitoring; triglycerides monitoring; hormone monitoring; licit and illicit drug monitoring; fermentation process control; and, chemical and biological warfare agent detection, such as anthrax and small pox. Unlike technologies based on absorption spectroscopy, its most versatile mode of operation is the transmission/reflection dichroic spectra of targeted molecules. The patented device should cost less than \$1,000 and be approximately the size of a paperback book.

The **Smart Medical Database** is an integrated management information system software program. The Smart Medical Database is a real time “dynamic” data structure whose diagnostics is based on Artificial Intelligence. Currently there is no satisfactory, timely body of clinical data that is useful in the practice of medicine. The Smart Medical Database provides a desperately needed, comprehensive inventory of clinical experiences involving patient presentation, test results, diagnoses, treatment protocols and eventual outcomes. The Smart Medical Database integrates clinical experience with cost, payment data and strategic planning both in the payer sector and in legislating truly informed and effective health care policy. Relevant data, useful in the making of day-to-day diagnostic and treatment decisions provides lower medical costs and better quality care. Studies show that the Smart Medical Database can provide a 25% savings in health care expenses.

The **Solid-State Molecular Sensor** is a nonlinear, bi-refrigent waveguide technology that identifies target molecules in an ambient environment. The Solid-State Molecular Sensor has many applications in developing miniaturized sensor devices for quick remote screening and recognition of chemical hazards in the environment. Trace impurities are continuously monitored for air/water contaminants notably chemical and biological warfare agents, and for pollution. More importantly, the technology would have worldwide impact when used in chemical and biological warfare (agent) detection. Probably the most lucrative market would be in medical applications. The Solid-State Molecular Sensor can be used to identify and monitor complex biological structures, test for allergic reactions and screen for common diseases. Additionally, this technology could hasten the time that new drugs are introduced into the marketplace when used to detect the biochemical and molecular responses of cells to candidate drugs. Approximately the size of a credit card, the patented Solid-State Molecular Sensor can be worn on clothing and provide constant monitoring with very low power consumption.

The **Enhanced Magnetic Resonance Imaging** uses a proprietary Bayesian-based methodology of conditional probabilities to enhance the resolution of MRI *flow* systems. The role of dynamic imaging in medicine is constantly and briskly growing in importance as a tool for diagnosis and research. Most importantly is the role of flow studies inside the vascular tree, which range from flow studies in the heart, major arteries, and through replacement devices like valves, to more delicate studies of flow patterns in the brain. Typically, flow studies of smaller, deeper vessels necessitate complicated invasive techniques such as the use of radio-labeled substances. Even so, these techniques lack the resolution to provide detailed flow parameters on a small scale.