NON-INVASIVE BLOOD GLUCOSE DETECTOR

Diabetes, a disease in which the body does not produce or properly use insulin, can lead to serious damage to many of the body's systems, including the nerves, blood vessels, eyes, kidneys and heart. It is also a leading cause of death in the United States; 7th most common cause in 2006 (CDC). It has been shown through two NIH studies* over 22 years that tight control of blood glucose levels, requiring multiple glucose tests each day, significantly reduces the risk of eye disease (76%), kidney disease (50%), nerve disease (60%) and heart attack and stroke (57%). Current monitoring technology (glucometers) require drawing blood for each glucose level measurement, which is painful, expensive (up to $800/year for supplies to complete recommended 4-5 measurements per day), and inconvenient (each test requires a new alcohol swab, lancet and test strip). As a result, most diabetics do not test as often as recommended by their doctors.

Researchers at UM-St. Louis have developed technology for a **non-invasive blood glucose detector**. The new portable optical device will allow for pain-free, inexpensive detection of glucose levels in capillaries of the finger with no waste (strips, lancets, etc.). Unlike other non-invasive monitors in development, this technology provides for detection in ~1 second based on a pulsatile approach, eliminating the potential problems of finger movement, temperature change, light power drift, and optical interference from finger components such as fat, muscle, bone, skin, nail and interstitial fluid.

POTENTIAL AREAS OF APPLICATIONS:

- Non-invasive detection of blood glucose in both Type 1 and Type 2 diabetics
- Non-invasive detection of additional blood analytes (cholesterol, hemoglobin, lactic acid)

PATENT STATUS: U.S. Patent Applications filed/published: US-2009-0105565 (published) US-2009-0247843 (published; US-2009-0079964 (published); US-2009-0292186 (published); US-2009-0116017 (published); 12/729,886 (filed); Five PCT applications filed; **(1) Diabetes Control and Complications Trial (DCCT), 1983-1993, 1441 people; (2) Epidemiology of Diabetes Interventions and Complications EDIC), 1993-2005, 93% of 1441 people in DCCT trial.*

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