

Abstract: Clearly explain the question or problem to be addressed and the approach to its answer or solution

Although cancer costs Texas \$22 billion/year, during the last 50 years the reduction in cancer death was only 5%, while reduction for heart disease was 64% with lower cost. Experimental data show early detection of cancer saves lives. Change in metabolism associated with cancer cells (up to 70 times greater) is the most reliable information for early detection of most cancer types. To reduce premature cancer death, early detection must be improved. Current diagnostic instrumentation detecting metabolism (PET) is inefficient, require high radiation to the patient and expensive exams. Safe affordable medical instrumentation for detecting such metabolic changes and other biological process changes at the molecular level at a very early stage is possible. Breakthrough 3D-CBS technology as proposed is 400 times more efficient than current PET. It maximizes signal capture showing minimum abnormal metabolism (or other biological processes), achievable by capturing simultaneously and accurately as many signals as possible from tumor markers at the lowest cost per signal captured. Complex algorithms with the possibility to correlate data received from neighboring detector elements are executed for longer than the time interval between consecutive input data, providing maximum utilization of radiation, reducing dosage to a level safe for annual full body screening of asymptomatic patients at high risk as well as detecting the restart of activity at an early stage in cancer survivors