

NEXT GENERATION OF ULTRASENSITIVE NANO SENSORS FOR LIVING CELL ANALYSIS

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Advances in the understanding of the genetic basis of cancer and related changes in the cell and local micro-environment, coupled with modern tools of biotechnology and molecular and cellular biology, are destined to ignite a révolution in detection, diagnosis, and treatment of cancer. At the heart of these expected advances, however, lies the challenge of studying and manipulating cancerous procedures that require only minimal numbers of cells from living patients requires the development of a new generation of highly improved markers having superior detection sensitivity and spatial resolution.

We have recently synthesized ultrasmall (nanoparticle) silicon markers that are brighter, safer, less fragile, and potentially more practical than alternatives currently available. These fluorescent silicon nanoparticles (FSP) - which are about one-billionth of a meter in diameter and contain about 30 silicon atoms - have none of the shortcomings of current fluorescent biological markers. Not only the substitution of commonly used fluorophores with this new class of fluorescent particles is expected, but new diagnostic methods may be enabled that are currently unfeasible because of the limited sensitivity of today's fluorophores.