

## **Biochips for Integrative Medicine**

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### **Abstract**

We have developed a number of biochips and fluidic devices for integrative medicine which are capable of screening for the health of cells, or for the detection of genetic conditions and infections in individuals, providing better information for accurate diagnosis or for the prevention of genetic disease and induced conditions. For example, a microfluidic device was developed that can screen for sperm health, thereby facilitating production of healthy blastocysts. A microarray has been developed to detect aminoglycoside antibiotic-induced deafness and other hearing-related genetic mutations. Early screening can prevent inadvertent exposure to such antibiotics, preventing loss of hearing. These tools have been used effectively: last year over 300,000 newborns in China were screened using our hearing loss DNA microarray and over 800 newborns were found to carry mitochondrial gene lesions for antibiotic sensitivity. Other chips have also been developed for prenatal diagnosis of thalassemia and for detection of over 500 chromosomal abnormalities. Additionally, microarray and microfluidic chips were developed for the identification of 17 mycobacteria and for 12 different bacterial respiratory pathogens, and for the detection of TB multi-drug resistance and for HBV infection and drug resistance.