



## Article of Interest

### New Genomics Technology Poised to Change Healthcare and Mass-Tort Litigation

By Bruce S. Gillis, M.D., M.P.H

DNA testing has altered the face of criminal justice. Scores of wrongfully imprisoned individuals have been freed from prison—and even death row—when DNA testing provided irrefutable evidence they were innocent of the crimes for which they were convicted.

By unlocking additional secrets stored in human DNA, we are poised to dramatically change many other areas of daily life. Building on the scientific groundwork of DNA-based analyses, medical experts are now able to pinpoint exactly how specific chemicals impact the DNA of individuals. This technology has massive potential in the fields of healthcare, workers compensation claims, insurance, and mass-tort litigation.

New genomics-based technology, pioneered by The Cytokine Institute and the faculty and staff of the University of Illinois' College of Medicine, can now determine how human cells and their individual DNA respond when exposed to a chemical and its metabolites, thereby offering an impartial methodology for providing scientifically-based evidence.

This technology, peer-reviewed in articles published by the scientific journals *Genomics* and *Environmental and Molecular Mutagenesis*, is called msds1™. It provides absolute specificity for identifying exactly how up to 36,000 parameters of an individual's DNA are affected by a chemical and its metabolites, so that scientists can tell with 99.9% certainty if a person was injuriously exposed to a particular toxin. These measurements exceed the current FBI-mandated level of 13 DNA parameters in criminal cases. Consequently, the msds1™ technology eliminates reliance on innuendoes and circumstantial evidence.

At the heart of msds1™ is a powerful innovation: the use of thumbnail-sized "chips" containing hundreds of thousands of Single Nucleotide Polymorphisms (SNPs), allowing researchers to scan an individual's DNA to determine if specific genes have been altered due to an exposure to a particular chemical. But the msds1™ technology isn't limited to that protocol. It also uniquely identifies the cellular impact of the metabolites of any chemical, plus it determines how a cell responds to chemical and metabolite exposures by measuring the release by a cell of small proteins called cytokines.

For example, it is now possible to determine whether a person's medical problem is truly due to a particular chemical exposure, such in the case of benzene and leukemia.

Along with the need to set safety standards to avoid injurious exposures, msds1™ can be used to achieve tangible, real-world information that is projected to save lives and billions of dollars in litigation.

#### Reduced Exposure at Work.

Employer use of msds1™ could dramatically change the way chemicals are handled in workplaces. Employers with the highest level of concern for the health and safety of workers will have a powerful tool to monitor employee health and the chemicals that impact it.

#### Timelier, Focused Treatment.

Diagnosing and treating workers and others exposed to chemicals can be an inaccurate and expensive proposition. This is largely due to a lack of information. Until now, it has not been clear if a specific chemical is the cause of a person's illness. Via msds1™, for the first time, healthcare professionals will be



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able to determine if a specific chemical actually caused a particular medical problem by determining whether there were specific changes at the cellular level which are unique to a chemical and its metabolites. Once confirmed, appropriate medical treatment tailored to that individual can be instituted. This should not only save enormous resources in healthcare, but more importantly, it will result in cost-effective and efficacious treatment.

### Fewer and Better Legal Judgments.

Presently, large numbers of people with varying degrees of chemical exposures—or none at all—can join a class action suit. When settled, the damages paid by a corporation are often tens and even hundreds of millions of dollars, but are spread over a large group of plaintiffs. With the msds1's scientifically-based evidence, it is now possible to identify which individuals were actually harmed, allowing only those who were actually injured to be compensated with larger damages.

Likewise, employers may avoid frivolous claims. For example, in one ongoing case, a tire salesman in California sued his employer over alleged exposures to benzene which he claimed resulted in his development of cancer. The employer's insurance company, Liberty Mutual, contracted to run the msds1™ test after all parties agreed to accept the results as evidence. The testing concluded there hadn't been any injurious exposures to benzene, saving Liberty Mutual \$2 million in treatment and litigation costs.

Mapping the human genome is one of the greatest human achievements. We are just now beginning to see some of the practical applications of this stunning scientific breakthrough. If msds1™ is any indication, the "era of the human genome" promises vast improvements in medical diagnosis, treatment, and workplace safety.

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