

New test for safer biomedical research results

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In cancer research, as in most other biomedical sciences, they are playing a key role: living cells, kept in sterile plastic containers with red culture media populating incubators in laboratories around the world. But do researchers always know what is really living in their culture dishes? Under the microscope, different cell lines are almost impossible to distinguish from each other. When these important research objects stop growing without apparent reason - is it because of the manipulations by the scientists or because of an invisible viral or bacterial infection?

Contaminations with other cell lines or pathogenic agents are a common and well-known problem. Often they are the reason why cell experiments fail to produce useable or reproducible results. Even worse, laboratory staff can get infected with dangerous [pathogens](#) from a cell culture.

To make those important cell culture experiments safer, DKFZ researchers Dr. Markus Schmitt and Dr. Michael Pawlita have developed a test which is able to identify 37 different cell contaminations in a single run. The researchers have tested the system in over 700 samples from different research labs and have now published their results.

The method called "Multiplex cell Contamination Test" (McCT) detects not only wide-spread viruses but also a number of mycoplasmas, which are considered the major contaminators of cell cultures. In addition, the test checks the cells for their origin. Thus, if dog genetic material is found in what are supposed to be monkey cells, then a contamination of the cell culture is obvious. The test also includes detection of commonly

used standard cell lines. Contamination with the fast-growing [cancer](#) cell line HeLa, for example, is a dreaded source of false results.

Pawlita and Schmitt found contaminations in a high percentage of cell samples. Twenty-two percent of tested cultures were contaminated with one of the various types of the parasitic bacterium called mycoplasma. "What we noticed about the results," says Markus Schmitt, "was that contaminations were frequent in some laboratories, while others sent in cultures that were constantly clean. Thus, care in laboratory work seems to play an important role."

The test is highly specific and needs no more than ten copies of foreign DNA in the cell sample to be positive. This is a sensitivity which is comparable to or even higher than those of previously available commercial mycoplasma tests. McCT results are reproducible to 99.6 percent. The method is based on multiplication of specific DNA sequences by polymerase chain reaction and subsequent detection of the multiplied DNA regions. A special advantage of the new test is that it can be carried out on a high-throughput basis. The DKFZ researchers can manage up to 1,000 tests per week.

Schmitt und Pawlita offer the service to external scientists and research institutes via the Steinbeis Transfer Center "Multiplexion", a DKFZ spin-off. If you are interested, please visit www.multiplexion.com for more information about the conditions.

More information: *Nucleic Acids Research* 2009, [DOI: 10.1093/nar/gkp581](https://doi.org/10.1093/nar/gkp581)

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