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A new Technology Sheds Light on *Salmonella* and *Listeria*

Renowned Journal publishes research on ultra-sensitive chemiluminescence-based pathogen detection

Dübendorf, Zurich – NEMIS Technologies Ltd. is excited to announce the recent publication of its research work on the innovative, ultra-sensitive chemiluminescence-based technology for the detection of *Salmonella* and *Listeria monocytogenes* has been published in the prestigious journal *Angewandte Chemie*.

Salmonella and *Listeria* are amongst the most widely distributed and deadliest causes of foodborne infections. It is estimated that about a million people per year are infected with *Salmonella* infections in the United States alone. Infections with *Listeria* can often be fatal. Their early, rapid and reliable detection on food and industrial food processing equipment is therefore paramount. Current testing methods usually requires the growth of bacterial cultures in a contained laboratory. A conclusive result based on standard diagnostic techniques generally takes two to six days.

In the journal *Angewandte Chemie*, a team of scientists from Tel Aviv University (Prof. Doron Shabat), The Zürich University of Applied Sciences (Prof. Lars Fieseler), Nemis Technologies AG (Zürich, Switzerland) and Biosynth AG (Staad, Switzerland) have introduced a new, ultrasensitive, chemiluminescence-based method for the direct detection of *Salmonella* and *Listeria monocytogenes*. The study is titled "[Ultrasensitive Detection of *Salmonella* and *Listeria monocytogenes* by Small-molecule Chemiluminescence Probes](#)".

The method is based on chemiluminescence – the emission of light resulting from a chemical process. The simplicity of the tests allows for both enrichment of the bacteria and their detection in a test tube, with no further sample preparation and therefore, no containment laboratory is required. The chemiluminescence probes have proven to be about 600 times more sensitive than conventional fluorescence probes.

The success of this technique is due to specially developed molecular probes combining a luminescent substance (a phenoxy-dioxetane) with a "trigger". In this form the probe does not light up. The trigger is tailored to the bacteria to be detected; it is recognized by a specific enzyme produced by the pathogen – a special esterase in the case of *salmonella* and a special phospholipase C for *listeria* – that splits it from the luminescent part.

This enzyme initiates a chemical reaction that causes the luminescent molecule to split and emit a very intense green light. Tests with various bacteria demonstrated that the probe tailored to the *Listeria* test only reacts to *Listeria monocytogenes*, not to other, non-pathogenic, strains of *Listeria*. The sensitivity of the test allows first results after six to eight hours and same day detection can be achieved even with dried bacteria from food industry surface materials such as stainless steel.

Arnaud Muller, the company's CEO, stated: "Excited by these findings; a great teamwork in developing our innovative technology. We are confident that our new method will be used more broadly to develop specific chemiluminescence probes relevant for the detection of a wide range of bacteria and point-of-care diagnostics. Additional detection kits are currently under development at NEMIS".

MEDIA RELEASE

For immediate release



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About NEMIS Technologies Ltd

NEMIS Technologies Ltd. (www.nemistech.com) was founded in January 2018 by an experienced team of entrepreneurs, scientists and diagnostics, medical and food business professionals. The company is entering the pre-industrialization phase. Several functional proof-of-concepts have been achieved and enable rapid prototype development with low technology risks. Industrial scale-up is in preparation with first marketable products possibly already available in 2020.

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