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RESISTELL: NANO-MOTION BASED FAST ANTIBIOGRAM

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The EPFL spin-off, Resistell, proposes revolutionary alternative to culture based antibiogram, the current gold standard in antibiotic susceptibility testing. The method has been developed by the Laboratory of Physics of Living Matter (LPMV EPFL, Lausanne, Switzerland) led by Prof. Giovanni Dietler and is based on the detection of nano-scaled motion that corresponds to living bacterial cells. Resistell is commercializing this technology and its offering a diagnostic device. The cantilevers, also used in atomic force microscopy, serve as sensors in the Resistell's instrument. Sensor deflection is measured by the laser-based system using photodiodes as detectors. The bacteria are non-specifically attached to the cantilevers, which are subsequently immersed in the custom-made fluid chamber. The dynamic fluctuations of the sensor in the growth medium and after exposure to the antibiotic are recorded and analyzed using custom-made software. The oscillations of the sensor indicate whether the bacteria in the

applied sample are metabolically active. When the antibiotic susceptible strains are exposed to the drug, they become non-viable within minutes and the oscillations of the sensor return to the level of abiotic sample. The variance of the signal acquired in the growth medium and after exposure to antibiotic serves as a marker of susceptibility or resistance. The pre-clinical data for a wide range of fast and slow growing bacteria are available. The MVP of a device is currently undergoing the clinical validation in the Swiss hospital. Resistell allows for the real-time monitoring of bacterial response to a drug, as well as the calculation of minimal inhibitory concentrations (MIC) and minimal bactericidal concentrations (MBC). Compared to the current gold standard antibiogram, Resistell is able to identify the most effective antibiotic in a matter of minutes rather than days. This means effective treatment of the patient can start on day one.

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