

RAMANMETRIX™ & RAMANBIOASSAY™ as a chip-based diagnostic System using Raman spectroscopy

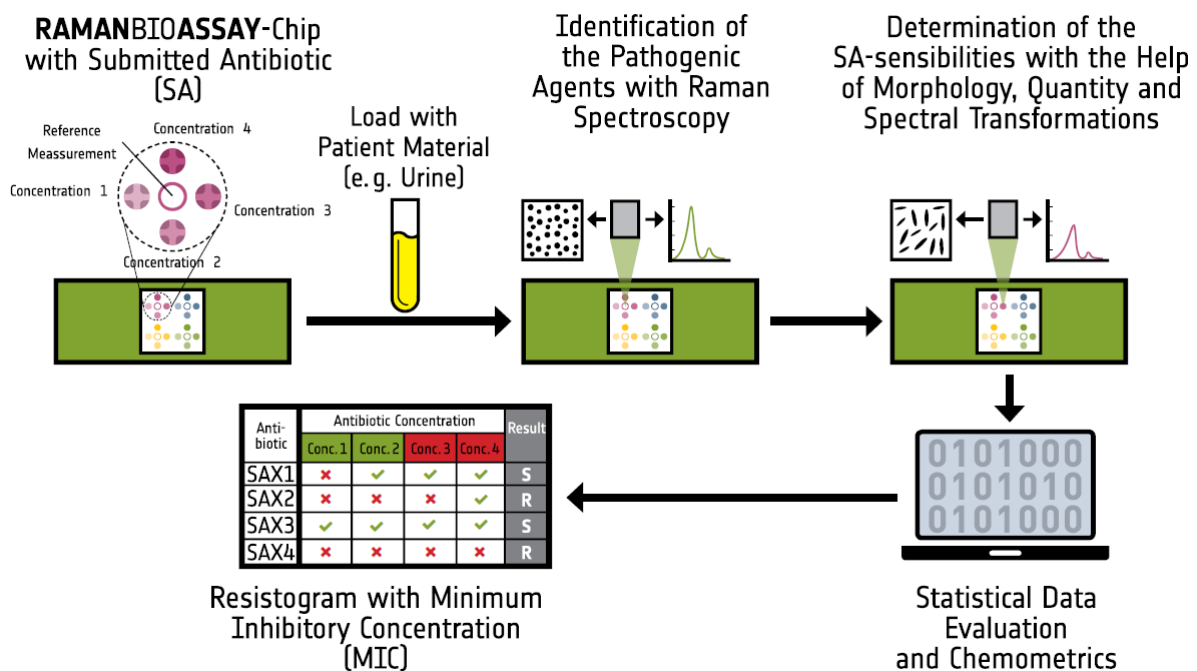
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The antimicrobial resistance world wide is already high and still increasing. The identification of pathogens within a very short time is possible with PCR, for example, but cost-intensive. An additional quantification and resistogramm takes currently at least 24 hours. A faster assessment of antimicrobial resistances is essential to control the increasing rate of AMR. The solution could be the **RAMANBIOASSAY™**, that is based on Raman spectroscopy.

The **RAMANBIOASSAY™** is the combination of a diagnostic device, a measurement chip and artificial intelligence with machine learning algorithms. The measurement chip is preloaded with antibiotics. Together with the simple handling this allows the diagnosis of pathogens within approximately 3 hours at comparable costs to the conventional method.



RAMANMETRIX™ is the brain behind **RAMANBIOASSAY™** and handles the data analysis with machine learning algorithms. The automated pre-processing steps are used to standardize spectra. This includes despiking, calibration, baseline correction and normalization. Afterwards the quality gets ensured with filters and the construction of either supervised or unsupervised machine learning models takes place. Because the test data and training data are processed in the same way pre-constructed models can be easily applied. Finally, a verification is carried out to check the accuracy of the models.

The standardized, traceable and reproducible pre-processing ensures robustness and high-quality models. Model building is easy and includes possibilities for modification. The dimensionality reduction can be performed using PCA or CNN. And the accuracy is verified by implemented cross-validation approaches.

RAMANMETRIX™ allows the validation at the touch of a button and can be integrated into different spectrometer software.