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**Applications of near infrared and Raman spectroscopy for the analysis of counterfeit medicines**

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Counterfeiting is a crime with dreadful consequences, especially in the case of medicines. All type of counterfeits can be found, from the ones devoid of Active Pharmaceutical Ingredient (API) to under dosed medicines. Fast and reliable analyses are consequently necessary to confirm the cases and evaluate the risk encountered by the patients. Near Infrared Spectroscopy (NIRS) and Raman spectroscopy present many advantages for that purpose. There are indeed both fast, non-destructive methods, that provide chemical information about the analysed samples. The advances in technology enabled their miniaturisation and therefore their use on the field for even faster analyses. Thanks to chemo-metric tools, the chemical signature of a suspect sample can be rapidly compared to the genuine references, providing a fast yes/no answer. Three applications will be presented for the analysis of counterfeit medicines. The first methods that will be presented consist of the NIR identification with a lab instrument, using different chemo-metric models, of all the tablets produced by Roche, which represents 30 pharmaceutical products. The described method will also be applied to the detection of counterfeits of these products. The performance of two NIR handheld spectrometers will then be presented for the analysis of counterfeited tablets on the field. The complementarity of NIR with Raman spectroscopy will finally be illustrated through examples of spectral analysis of both solid and biological products.

**Biography**

Klara Dégardin is working at Roche Pharmaceuticals in Switzerland, and is responsible for the Anti-Counterfeiting lab. She is holder of a master's degree in Chemistry and of a PhD in forensic science. She has been working at Roche since 2007, and within the complaints and counterfeits group has specialized in various analytical methods like Raman and near infrared spectroscopy.

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