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Article

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Evaluation of Near-Infrared Chemical Imaging (NIR-CI) for the Authentication of Antibiotics

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ABSTRACT

Counterfeit medicines represent a public health threat that results in treatment failure and may even have lethal effects in the worst-case scenario. Near-infrared Chemical Imaging (NIR-CI) offers an informative and in-depth tool for several applications in the pharmaceutical industry, particularly for medicine authentication. The current study aimed to authenticate antibiotic tablets using NIR-CI. These tablets were measured non-destructively using a near-infrared microscope within their blister packaging, without their blisters, sectioned and crushed. The results showed that there was no marked difference in measuring the tablets within or without their blister packaging. The mean spectra of tablets showed high correlation coefficient values against the active pharmaceutical ingredient, in case of authentic tablets. On the other hand, counterfeit tablets showed key differences from their authentic alternatives with low correlation coefficient values. More specifically, counterfeit tablets showed poor distribution of the active pharmaceutical ingredient and excipients. It has been proved from the results that NIR-CI process is an authentic process for the evaluation of counterfeit tablets, non-destructively.

Keywords: counterfeit medicines, active pharmaceutical ingredient, blister packaging, near-infrared chemical imaging, excipients

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