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Pharmaceutical and Biomedical Applications of Raman Spectroscopy

Raman Spectroscopy has received great attention in solid-state pharmaceutical applications ranging from the verification of raw materials to quality control of products. On-line or even in-line process monitoring in drugs production lines is also considered advantageous. Detection of active pharmaceutical ingredients (APIs) in biological fluids in extremely small concentration levels is also a challenging task. Sophisticated and time-consuming techniques are currently used in these cases. Raman spectroscopy can be further extended to the study of bone and joints in human and animal models. Metabolic and degenerative diseases, like osteoporosis and osteoarthritis, can be identified. The procedures and factors responsible can be explored. In this work, some of such cases will be presented. Conventional, portable and bench-top micro-Raman spectrometers analyzing APIs and formulations as they are and inside packaging, in biological fluids (blood serum, urine, and saliva). Raman metrics established for the study of bony and cartilaginous tissues in several cases will be also shown.

Figures

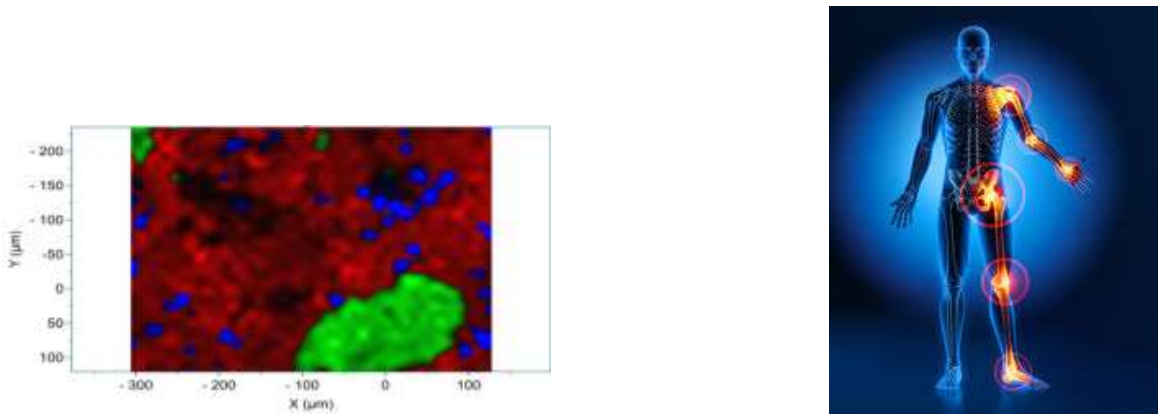

Figure 1: Left: Raman map of a section of a two-API pain-killer. Right: Raman map Human bones and joints studied with Raman spectroscopy

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