

## **ABSTRACT**

Medicines for erectile dysfunction are among the most counterfeited pharmaceuticals in the world. Therefore, new methodologies for the fast and efficient characterization of such medicines are badly needed. In this work, the PIXE and MeV-SIMS techniques were employed for the elemental and molecular characterization of sildenafil-, tadalafil-, and vardenafil-based medicines. The results indicate that all medicines had the respective active ingredients. Finally, principal component analysis proved to be a valuable tool for a clear distinction of different groups of pharmaceuticals.

**Keywords:** Viagra; PIXE; MeV-SIMS.