ENANTIOSELECTIVE ANALYSIS OF TETRAMISOLE AND ITS PHASE-1 METABOLITES USING HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY TANDEM MASS SPECTROMETRY (HPLC-MS/MS) AND SUPERCRITICAL FLUID CHROMATOGRAPHY TANDEM MASS SPECTROMETRY (SFC-MS/MS)

Giorgi Amiranashvili

giorgi.amiranashvili858@ens.tsu.edu.ge

Institute of Physical and Analytical Chemistry, School of Exact and Natural Sciences, Iv. Javakhishvili Tbilisi State University, I. Chavchavadze Ave 1, 0179 Tbilisi, Georgia

For many years it was believed that (street) cocaine samples were adulterated with levamisole despite several studies indicating that the adulterant could not necessarily be levamisole but its racemic analogue tetramisole. The reason for possible misinterpretation of earlier results could be the fact that the mass spectrometric detector (which is the most widely used detector in forensic and toxicology laboratories) cannot differentiate between levamisole and tetramisole without using enantioselective separation techniques. Therefore, one of the major goals of our research was to develop methods for enantioselective determination of tetramisole and then apply it to analyze oral fluid samples from drug users. This would enable us to answer the question of whether only levamisole or sometimes also tetramisole is used as an adulterant of cocaine.

We conducted the research using HPLC-MS/MS and SFC-MS/MS instruments using various mobile phases and chromatographic columns. After selecting optimal conditions, we processed real samples of drug abusers.

Based on the analysis of patients' biological samples, we determined that in most cases, the adulterant detected was not levamisole, as previously assumed, but racemic tetramisole.

In addition, this study also addressed the controversial issue about the metabolites of tetramisole. It was previously assumed that levamisole enhanced the effect of cocaine through one of tetramisole's metabolites, aminorex. This metabolite was also supposed to be responsible for the increased toxicity of cocaine. However, our research called this notion into question. We discovered that the main metabolite is not only aminorex, but also 4-phenyl-2-imidazolidinone.