# Separation of isomeric steroid metabolites using high resolution IMS-MS

IMS-TOF

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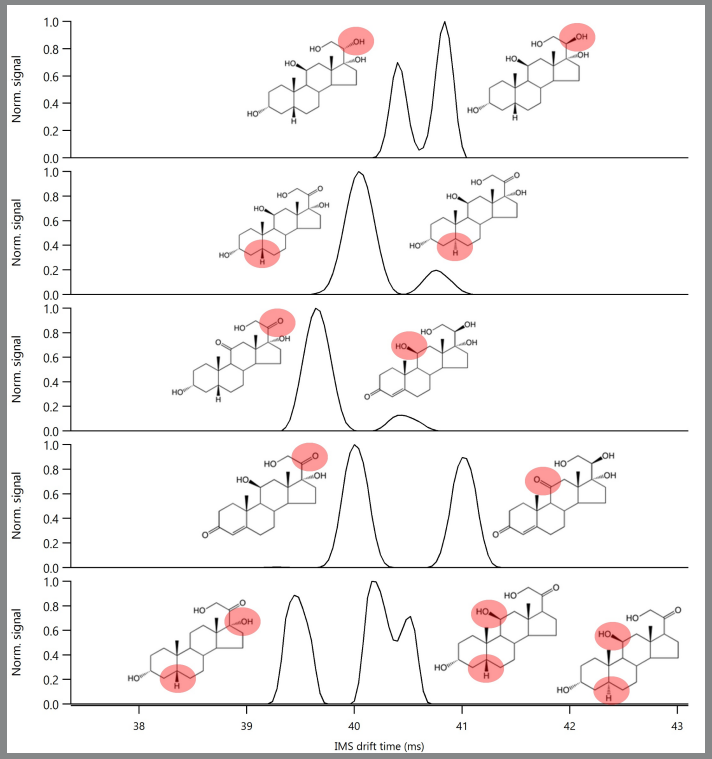
Steroids are the most important signalling molecules in biology. Their metabolites are typically analyzed in bodily fluids such as urine to screen for various hormonal disorders. Many of these metabolites are closely related isomers - and even though they exhibit strong chemical and structural similarity, their biological activity can be extremely different.

The commonly used methods for the analysis of steroid metabolites is gas or liquid chromatography coupled to mass spectrometry (GC-MS and LC-MS). GC exhibits good separation power but requires extensive sample preparation (derivatization) and long analysis times. Although samples can be analyzed without derivatization by liquid chromatography, most isomers are not at all or unsatisfactorily resolved unless very long gradient separations (> 60 min) are used.

High resolution IMS-MS is especially good at separating isomers - and therefore a very attractive technique as an alternative to GC-MS and LC-MS. Herein we show that using the TOFWERK IMS-TOF, progesterone metabolites that sometimes only differ in the orientation of a hydrogen can be baseline separated.

**High-resolution IMS-MS allows direct analysis of isomeric steroid metabolites with the separation power of GC-MS and the easy-of-use of LC-MS.**




Separation of isomeric progesterone metabolites commonly found in urine. Using the TOFWERK IMS-TOF and electrospray ionization, laborious sample preparation as commonly done for GC analysis is avoided. The high ion mobility resolution allow confident detection and quantification of isomers that cannot be separated by LC. The instrument was operated with the following settings: IMS pressure 1000 mbar, IMS temperature 70°C, nitrogen as drift gas.

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