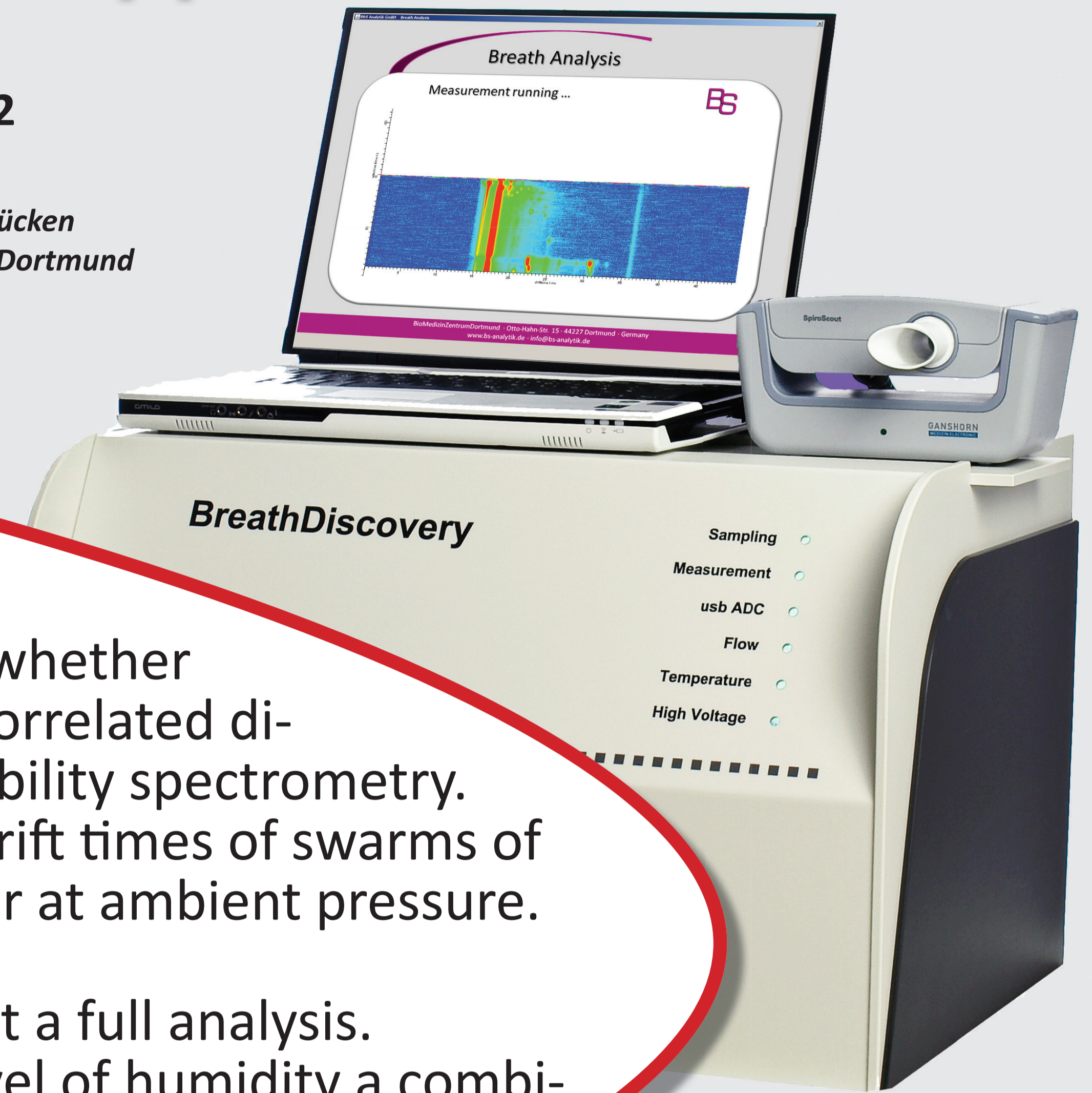


# Ion Mobility Spectrometry for Metabolic Profiling of Human Breath in Intensive Care and Point of Care Applications

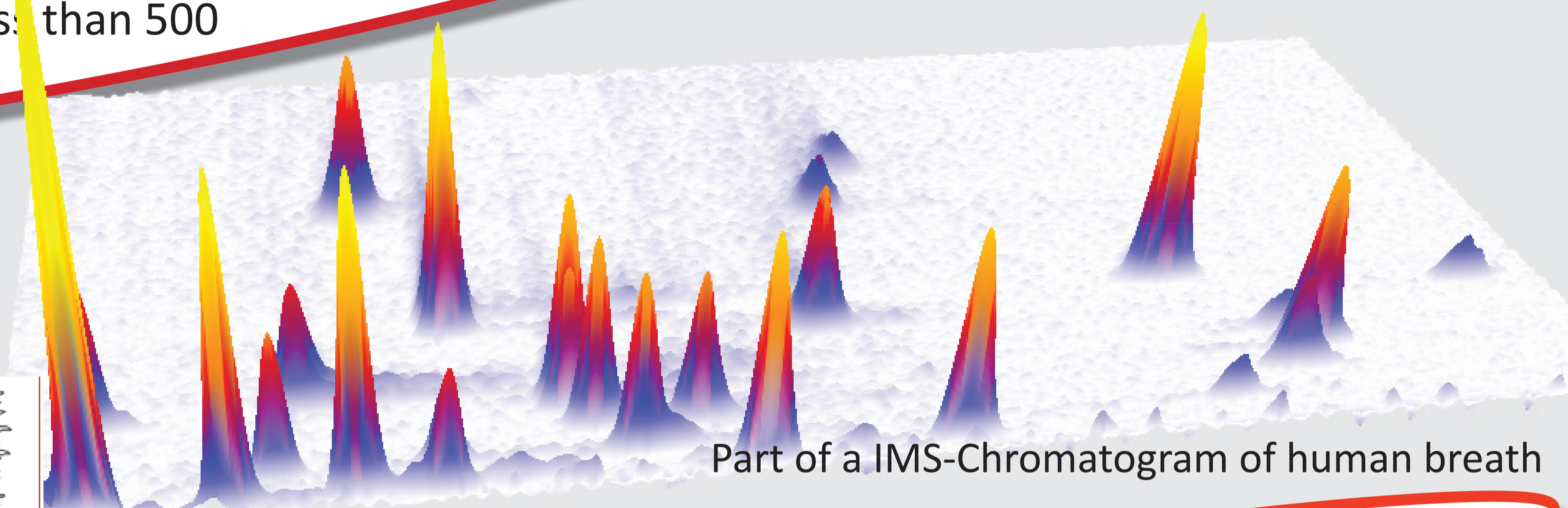
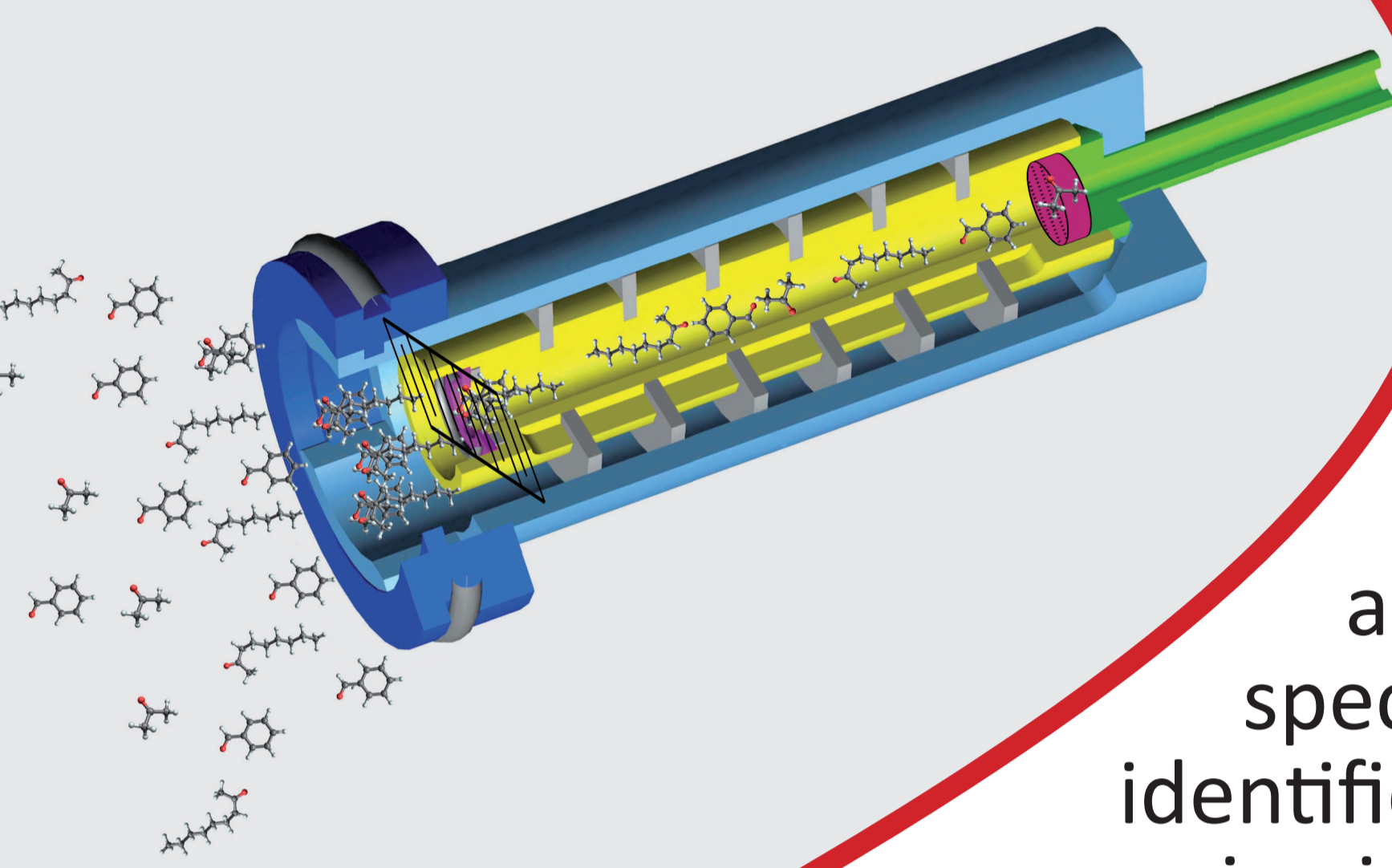
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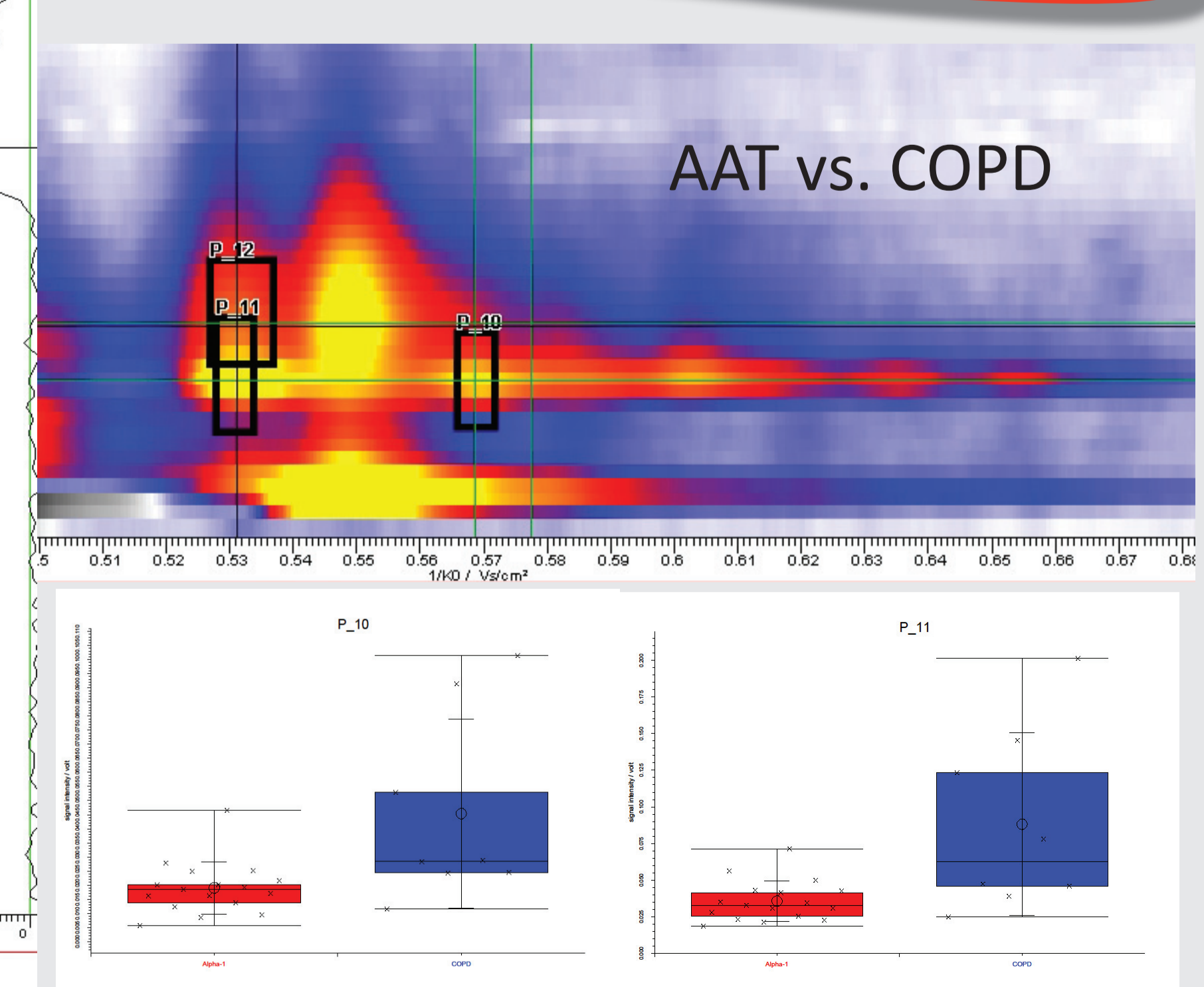
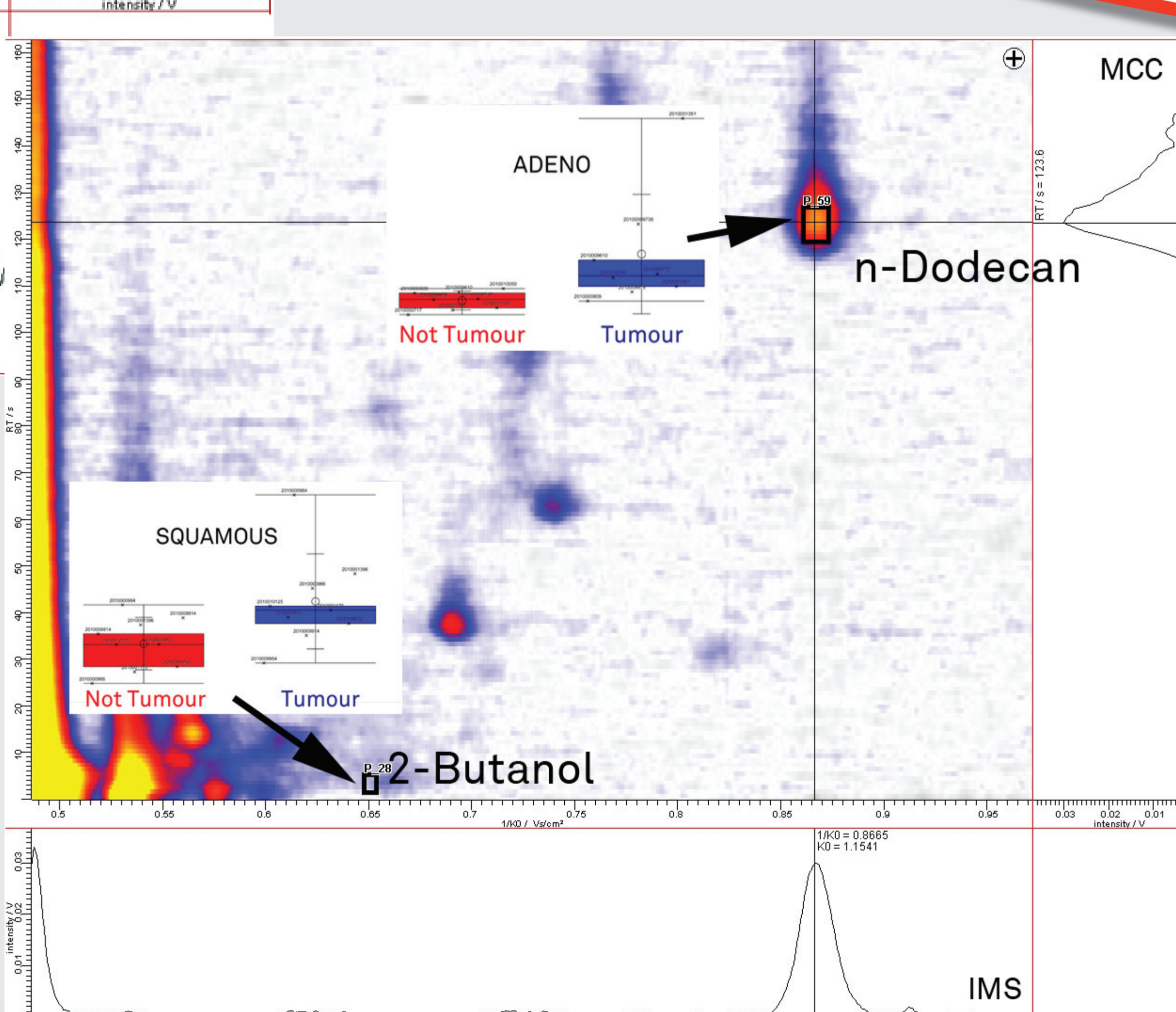
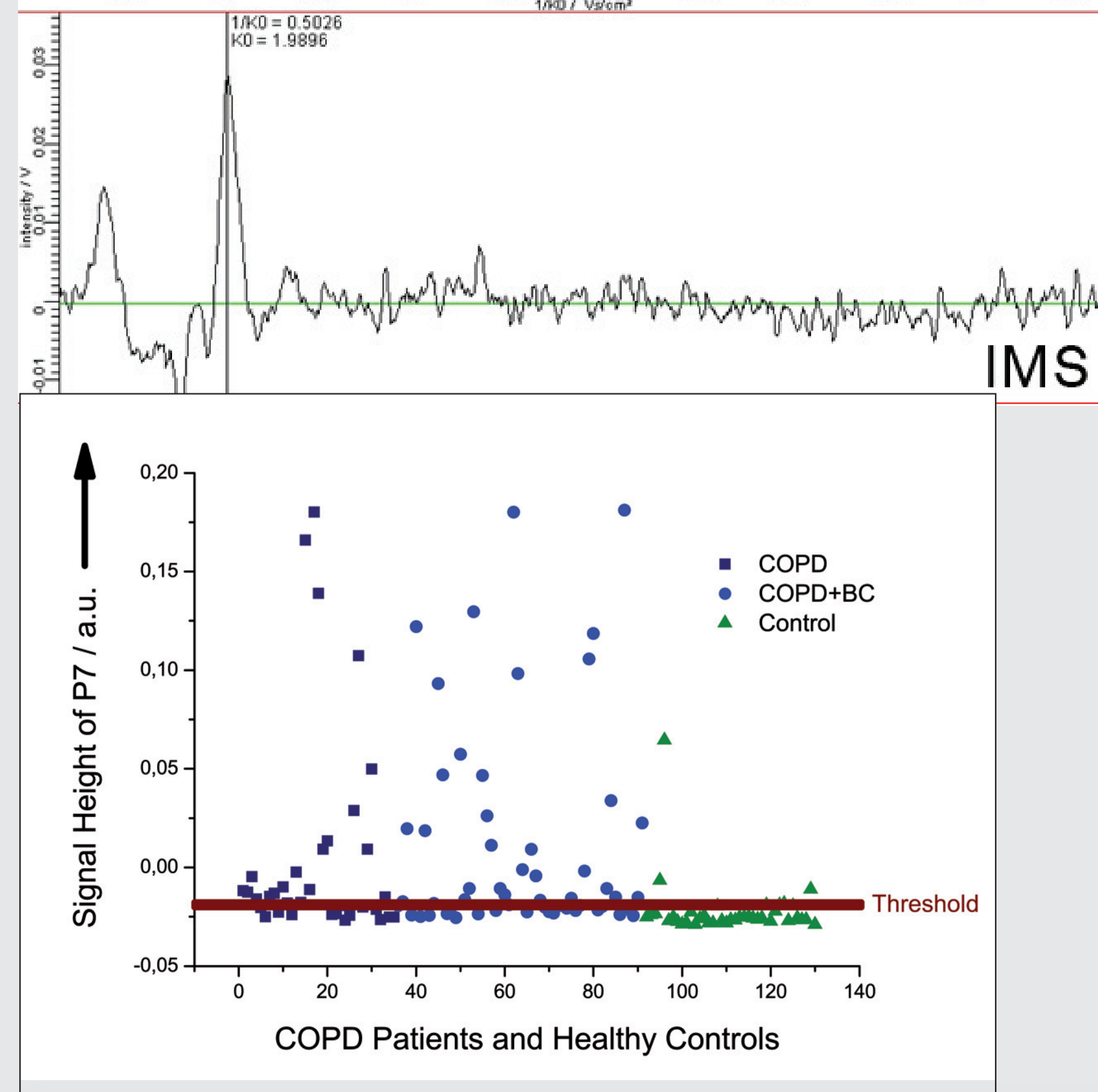
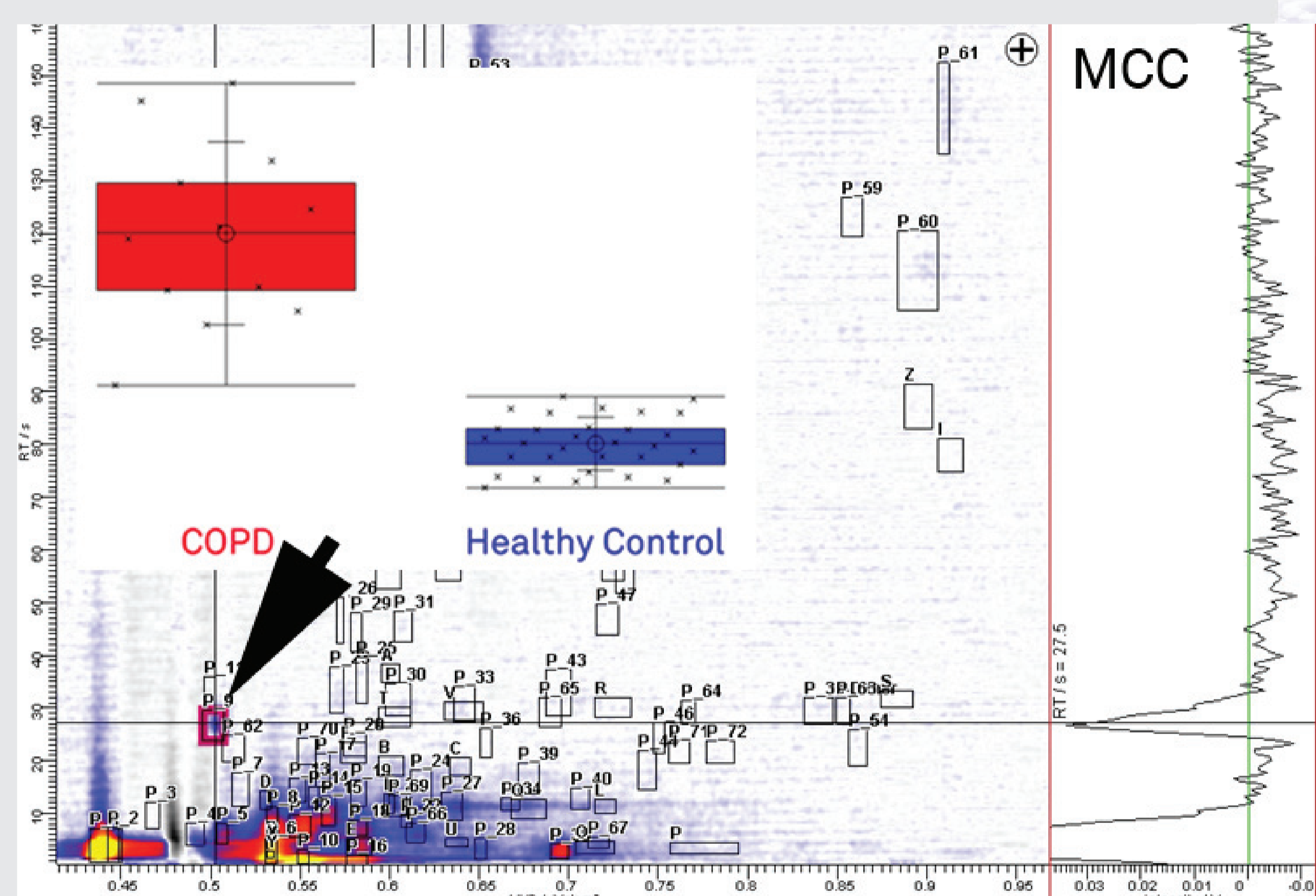
It is well known, that human breath acts as carrier of information on the metabolic processes in the human body. Because of the fact, that early diagnosis of lung cancer and airway infections is gaining increasing importance, we have examined whether volatile metabolites in human exhaled air can be correlated directly to different kinds of diseases using ion mobility spectrometry. The IMS investigations are based on different drift times of swarms of ions formed from the metabolites directly in air at ambient pressure.

About 10 mL of breath is necessary to carry out a full analysis. For investigations of human breath at a high level of humidity a combination of a Multi-Capillary Column (MCC) partly pre-separating the analytes is used in combination with a conventional ion mobility spectrometer (IMS). An IMS coupled to a MCC allows for the identification and quantification of volatile metabolites occurring in human breath down to the ng/L- and pg/L-range of analytes within less than 500 s and without any pre-concentration steps directly.



Part of a IMS-Chromatogram of human breath

The sampling was related to the end-tidal breath using a CO<sub>2</sub>-sensor commonly applied for spirometric investigations in pneumology and intensive care units. Parallel measurements using GC/MSD allow the validation of the IMS-data and support the alignment of signals GC/MSD to MCC/IMS.



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