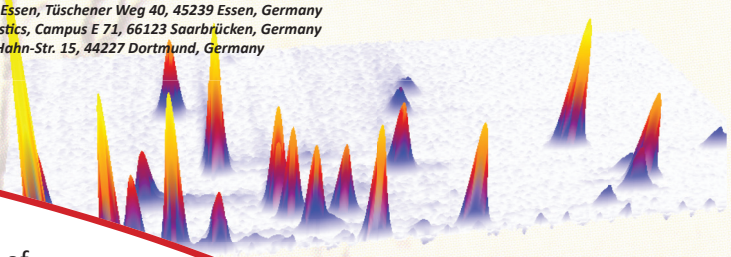
Volatile Organic Compounds (VOC) sampled during bronchoscopy in lung cancer patients

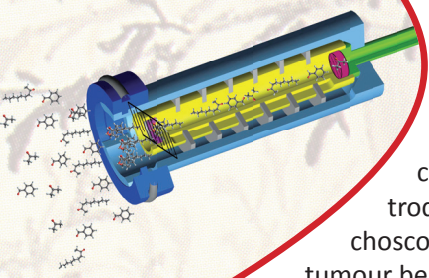
K. Darwiche[1], J.I. Baumbach[2,3], U. Sommerwerck[1], H. Teschler[1], L. Freitag[2]

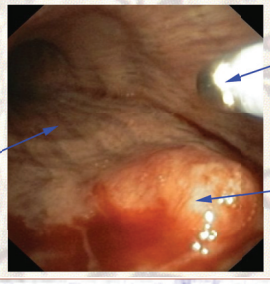
1 Ruhrlandklinik, Clinic for Pulmonology, University Hospital Essen, Tüschener Weg 40, 45239 Essen, Germany
2 KIST Europe, Department Microfluidics and Clinical Diagnostics, Campus E 71, 66123 Saarbrücken, Germany
3 B&S Analytik, BioMedicalCenter Dortmund, Otto-Hahn-Str. 15, 44227 Dortmund, Germany

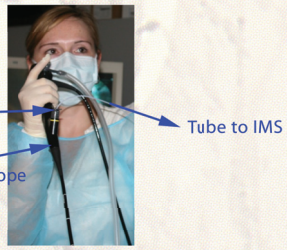


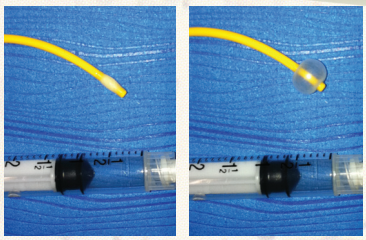
Part of a IMS-Chromatogram of human breath

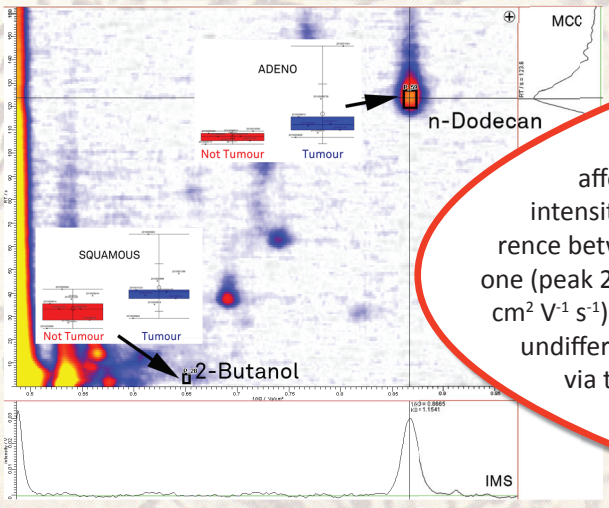
Ion mobility spectrometry coupled to a multi capillary column (MCC/IMS) has the potential for diagnosis of lung cancer. However, the origin of specific volatile organic compounds (VOC) detected in patients with non-small-cell lung cancer (NSCLC) still remains unknown. We wondered whether if the spectrum of VOCs in bronchi close to the tumour is different to the VOCs in the bronchi of the contralateral lung in lung cancer patients. 10 Patients with histologically proven peripheral NSCLC were included in the study. During the diagnostic flexible bronchoscopy a catheter connected to an MCC/IMS was introduced through the working channel of the bronchoscope. Gas samples were aspirated from the tumour bearing side and the contralateral lung before biopsies of the tumour have been taken.











There were no adverse events. In the measured data set 61 common peaks could be detected. Three peak intensities were significantly higher on the tumour bearing site compared to the unaffected side lung. One peak had a significantly lower intensity on the tumour site. Two peaks showed a difference between both lungs only for adenocarcinoma and one (peak 28; Retention time 3,4 sec; ion mobility K_0=1,54 $cm^2\ V^{-1}\ s^{-1}$) particularly in patients with squamous cell and undifferentiated NSCLC. Analyzing gas samples aspirated via the bronchoscope with MCC/IMS is feasible. The spectrum of VOCs is different between the tumour bearing lung and the not affected lung in lung cancer patients. Therefore these VOCs may have been produced in or nearby the tumour.

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* Korea Institute of Science and Technology Europe Forschungsgesellschaft mbH (KIST Europe)
Campus E 7 1 - 66123 Saarbrücken - Germany
phone + 49 (0) 681 9382 229 - fax + 49 (0) 681 9382 240

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http://www.kist-europe.de

Contact: PD Dr. Jörg Ingo Baumbach
Head of Department Microfluidics and Clinical Diagnostics
baumbach@kist-europe.de