

## new diagnostics

### 1168P VALIDATION OF 1H-NMR-BASED METABOLOMICS AS A TOOL TO DETECT LUNG CANCER IN HUMAN BLOOD PLASMA

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**Aim:** Until today no effective method permits the early detection of lung cancer. Evidence has shown that disturbances in biochemical pathways which occur during the development of cancer provoke, changes in the metabolic phenotype. Recently, our research group has constructed a statistical classifier by means of multivariate orthogonal partial least squares-discriminant analysis (OPLS-DA). This classifier (constructed with 110 variables) allows to discriminate between 190 lung cancer patients (71% male, 29% female, age: 68 ± 10, BMI: 25.8 ± 4.7) and 182 controls (53%

male, 47% female, age: 69 ± 11, BMI: 28.1 ± 4.8) with a sensitivity of 76% and a specificity of 89%, with an AUC of 0.86. When only the 19 most discriminating variables (VIP value > 0.8) were selected to construct a classifier (i.e. glucose, lactate, myo-inositol, threonine, alanine, isoleucine and lipids signals) a sensitivity of 69%, a specificity of 83% and an AUC of 0.81 is achieved. The present study aims to examine the predictive accuracy of these statistical classifiers in an independent cohort of 50 lung cancer patients (60% male, 40% female, age: 67 ± 9, BMI: 25.6 ± 4.3) and 58 controls (64% male, 36% female, age: 63 ± 13, BMI: 26.9 ± 5.7).

**Methods:** The metabolic phenotype of the plasma samples from this independent cohort is determined by 1H-NMR spectroscopy. Subsequently, the constructed classifiers are used to classify the independent samples. OPLS-DA is used as discriminant statistic.

**Results:** By using the classifier constructed with all 110 variables, 72% of the lung cancer patients and 72% of the controls are correctly classified, with an AUC of 0.79. Moreover, when the classifier constructed with only the 19 most discriminating variables is used to classify the independent samples, a sensitivity of 82%, a specificity of 64% and an AUC of 0.79 is achieved.

**Conclusions:** A statistical classifier constructed with only the most discriminating variables shows already a fair predictive accuracy, similar to this of the classifier build with all variables. Future experiments will investigate whether the constructed classifier can be used as a valid screening tool.

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