

# Evaluation of urinary volatile metabolites as potential biomarkers for prostate cancer diagnosis

Ana Rita Lima<sup>1</sup>, Joana Pinto<sup>1</sup>, Ana Isabel Azevedo<sup>1</sup>, Carmen Jerónimo<sup>2,3</sup>, Rui Henrique<sup>2,3,4</sup>, Fernando Remião<sup>1</sup>, Maria de Lourdes Bastos<sup>1</sup>, Márcia Carvalho<sup>1,5</sup>, Paula Guedes de Pinho<sup>1</sup>

<sup>1</sup>UCIBIO/REQUIMTE, Department of Biological Sciences, Laboratory of Toxicology, Faculty of Pharmacy, University of Porto, Porto, Portugal

<sup>2</sup>Cancer Biology & Epigenetics Group, Research Center (CI-IPOP) Portuguese Oncology Institute of Porto (IPO Porto), Porto, Portugal.

<sup>3</sup>Department of Pathology and Molecular Immunology-Biomedical Sciences Institute (ICBAS), University of Porto, Porto, Portugal.

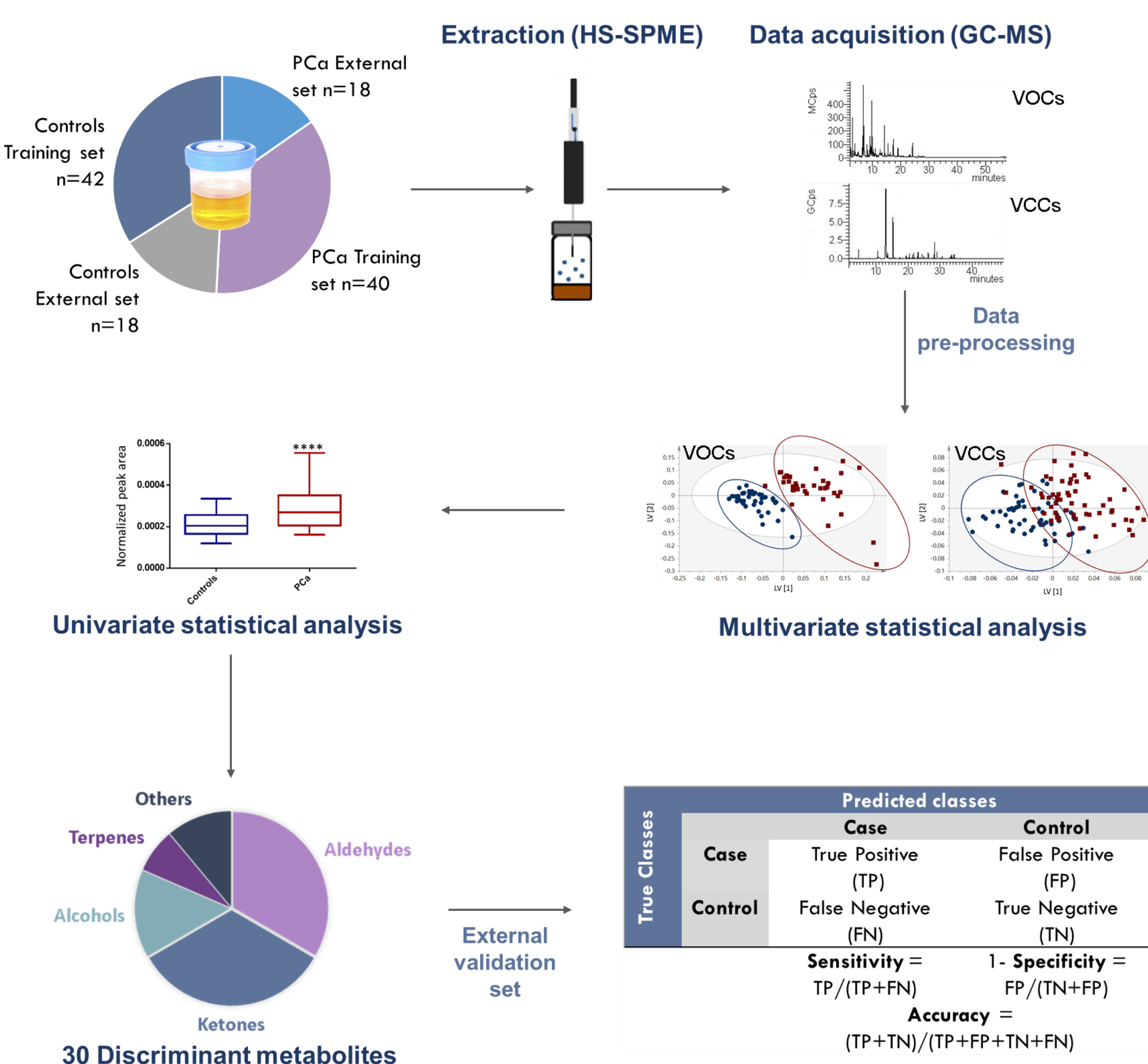
<sup>4</sup>Department of Pathology, Portuguese Oncology Institute of Porto (IPO Porto), Porto, Portugal.

<sup>5</sup>UFP Energy, Environment and Health Research Unit (FP-ENAS), University Fernando Pessoa, Porto, Portugal.

## Introduction

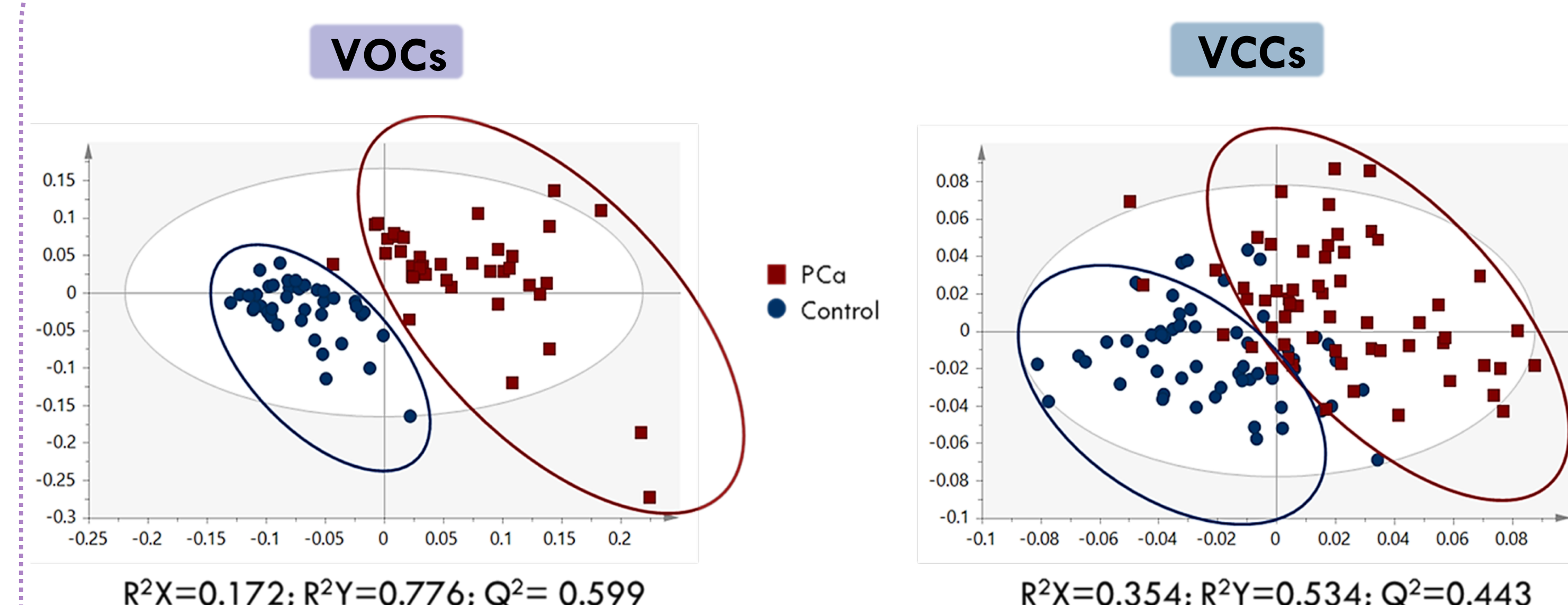
Prostate cancer (PCa) is the second leading cause of cancer-related death in men in most western countries. Currently, serum prostate specific antigen (PSA) is the most used biomarker for PCa diagnosis in clinical practice. However, this biomarker has limited sensitivity (21%) and specificity (91%). These important drawbacks highlight the need for new PCa biomarkers. The aim of this study was to define a panel of biomarkers for PCa diagnosis based on the profiling of volatile organic compounds (VOCs) and volatile carbonyl compounds (VCCs) present in urine.

## Material and Methods

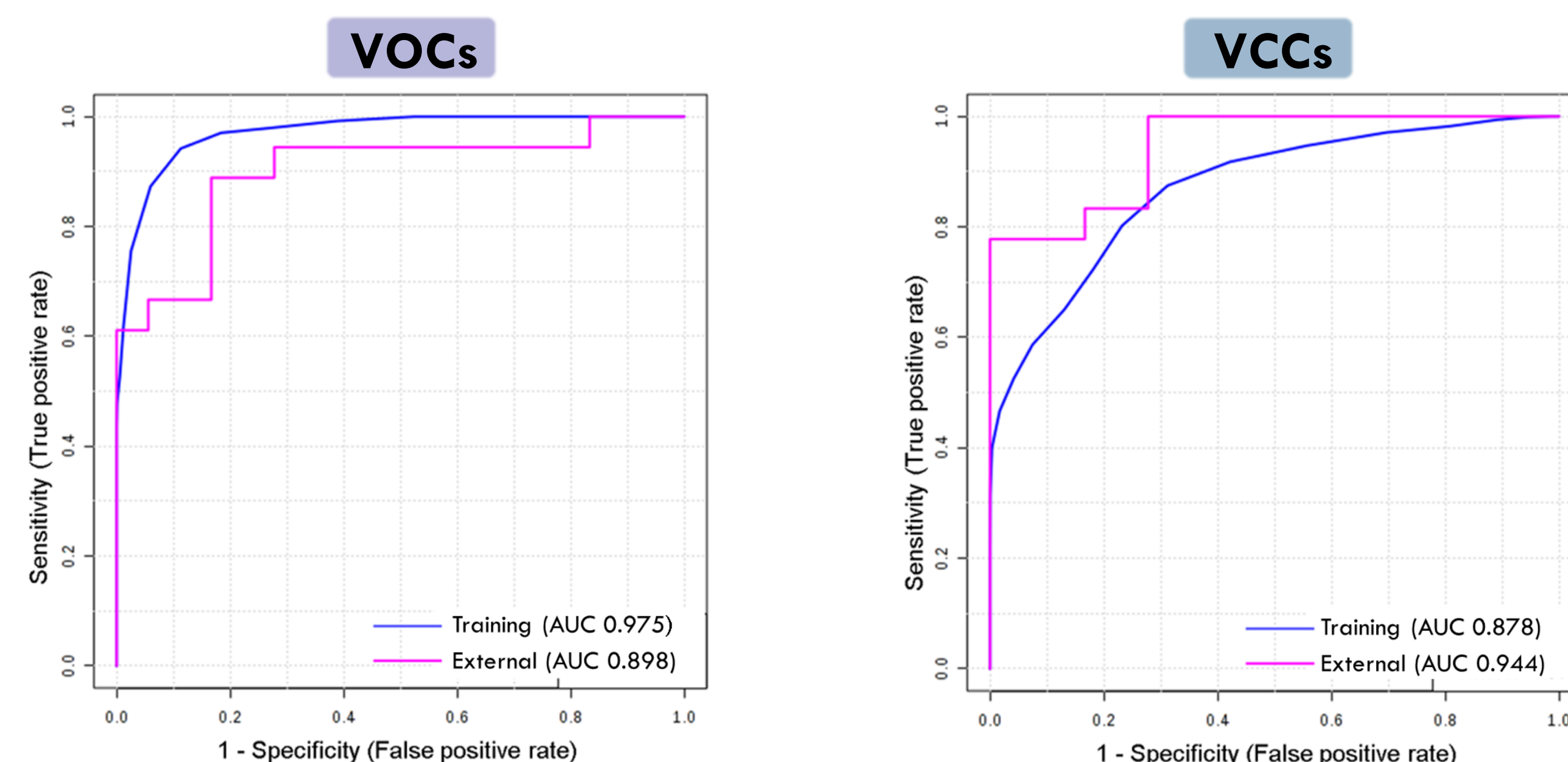


## Results

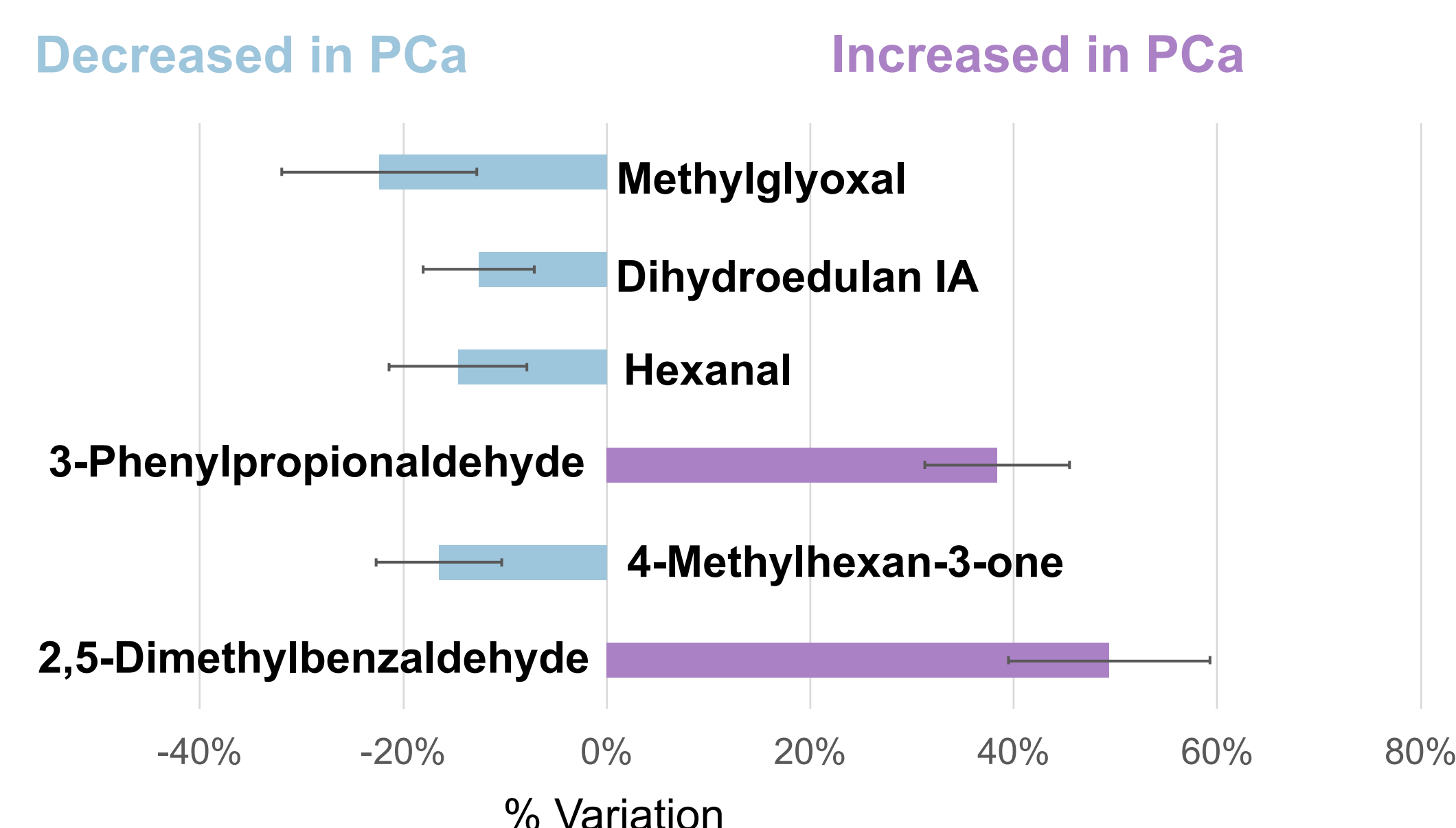
### Discrimination between PCa and control urine samples



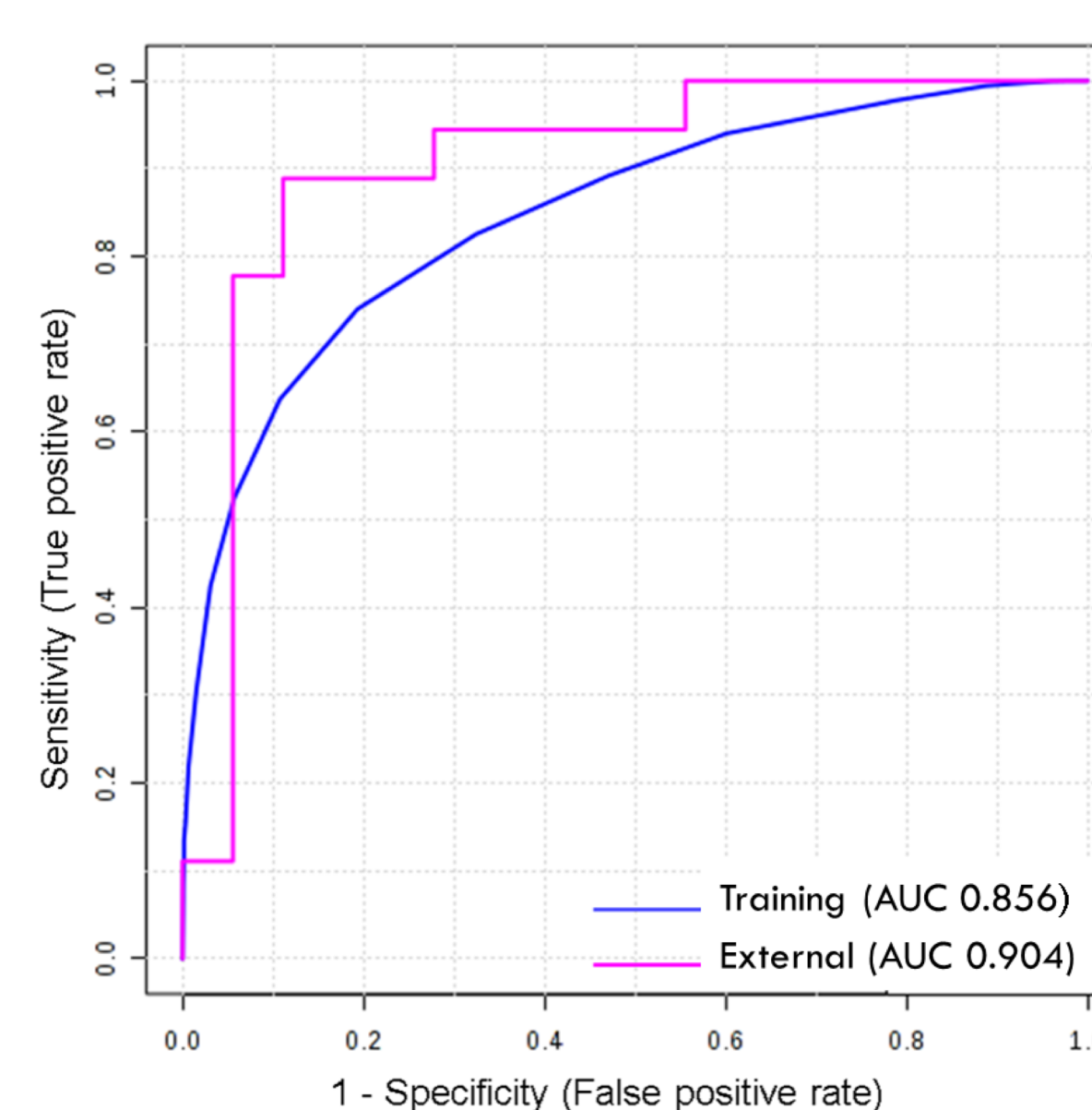
### Models validation: Training and external sets



### Definition of the biomarker panel



### 6-Biomarker panel validation



#### Training set

Sensitivity: 72%  
Specificity: 96%  
Accuracy: 79%

#### External set

Sensitivity: 89%  
Specificity: 83%  
Accuracy: 86%

## Conclusions

- These results revealed the potential of urinary volatile compounds to discriminate PCa patients from controls;
- A panel of 6 volatile biomarkers was established for PCa diagnosis, disclosing high accuracy for discrimination of PCa patients from controls in an external validation cohort;
- The knowledge gained from the definition of a PCa volatile signature in urine has the potential to be used in the development of an electronic nose sensor.

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Lima AR, et al. *British Journal of Cancer*, 2019

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