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Characterization of biomarkers in breath of lung and breast cancer patients





# Characterization of biomarkers in breath of lung and breast cancer patients

# **Fact Sheet**

**Project Information** 

BREATH		Funded under Specific programme "People" implementing the
Grant agreement ID: 220511		Seventh Framework Programme of the European
0		Community for research, technological
Project closed		development and demonstration activities (2007 to
		2013)
<b>Start date</b> 1 May 2008	End date 30 April 2010	<b>Total cost</b> € 170 902,35
		<b>EU contribution</b> € 170 902,35
		Coordinated by CONSIGLIO NAZIONALE DELLE RICERCHE Italy

# **Objective**

Recent studies have noted that dogs are able to identify with high confidence the presence of cancerous tissues in patients at an early stage based on sniffing a breath sample. Because exhaled breath provides non-invasively a continuous window to the biochemical activity within a person, its analysis for medical diagnosis has produced

a substantial literature. However, its diagnostic reliability is still incomparable to that of dogs. In fact, breath analysis has not been introduced into common clinical practice yet mainly due to the lack of correlation with high confidence between the presence of certain biomarkers and the illness. Recently, we have shown that widely used commercial atmospheric pressure ionization mass spectrometers (API-MS) can sense breath vapors with molecular masses approaching 450 Da with high signal/background. These findings are in striking contrast with prior breath analysis literature (GC-MS and PTR-MS), involving molecular masses below 290 Da. Our data suggests that dogs have the sensitivity needed to detect such heavy breath vapors, which must be key elements in their cancer recognition process. Urea is one important low volatility biomarker which has not been observed in previous GC-MS and PTR-MS studies, but which we can measure in breath and have been positively identified. In our approach, the subject's breath is exposed to an electrospray of acidified water, where protonation of polar species takes place near the inlet of an API-MS. The same approach has been successfully used to detect acids (i.e. lactic and pyruvic acids), operating in negative mode. Besides its sensitivity, one main advantage of this approach is that it is on-line and requires no breath sample collection. The main goal of this project is to determine potential biomarkers in breath of breast and lung cancer patients. To do so, we will carry out a systematic survey comparing the breath of healthy subjects and cancer patients.

### Fields of science (EuroSciVoc)

medical and health sciences > clinical medicine > oncology > lung cancer agricultural sciences > animal and dairy science > domestic animals medical and health sciences > clinical medicine > oncology > breast cancer natural sciences > earth and related environmental sciences > atmospheric sciences > meteorology > atmospheric pressure

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## Keywords



# Programme(s)

<u>FP7-PEOPLE - Specific programme "People" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to</u>

# Topic(s)

PEOPLE-2007-2-1.IEF - Marie Curie Action: "Intra-European Fellowships for Career Development"

#### **Call for proposal**

FP7-PEOPLE-2007-2-1-IEF See other projects for this call

#### **Funding Scheme**

MC-IEF - Intra-European Fellowships (IEF)

#### Coordinator

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CONSIGLIO NAZIONALE DELLE RICERCHE EU contribution € 170 902,35

Total cost

No data

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Region

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Activity type

**Research Organisations** 

Links

Contact the organisation C Website C Participation in EU R&I programmes C HORIZON collaboration network

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