



LICENSING OPPORTUNITY:

Fast and Label-Free Detection of Polluting Carbonaceous Particles: a Gap in the Diagnostic Market

BACKGROUND INFORMATION

Carbonaceous particle exposure and air pollution in general lead to serious *adverse human health effects* and pose multiple challenges in terms of *exposure, risk and safety assessment*.

Highly desirable for *quick screening* are label-free approaches for detecting these particulates in *biological* and *medical context*.

Hasselt University and KU Leuven have developed a new *sensitive, label-free* and *biocompatible* technique for the detection of the particles in (non)-biological samples.



UHASSELT

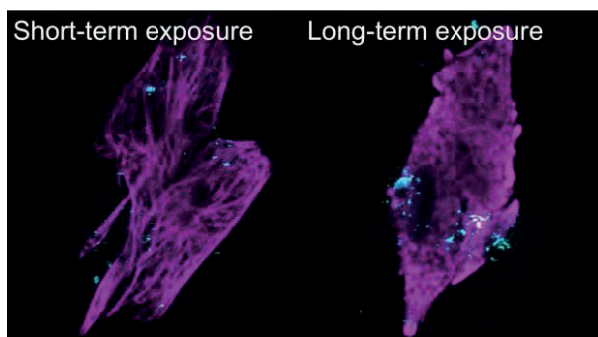
KNOWLEDGE IN ACTION



COMPELLING RESULTS

Research showed that carbonaceous particles can be easily detected *without* the need of *sample preparation or pretreatment in different biological contexts* (see figure for detection in exposed human lung fibroblasts).

Simultaneous detection of cell functioning using various conventional fluorophores and the carbon loading is very flexible. This approach directly puts the location of the particles in their biological context, yielding an extremely fast detection for demanding *biomedical research including toxicology and epidemiology*.



Bové H. *et al.* Biocompatible LabelFree Detection of Carbon Black Particles by Femtosecond Pulsed Laser Microscopy. *Nano Letters* (2016); 16(5): 3173-3178.

KEY FEATURES AND ADVANTAGES

- Example body fluid validation: *urinary carbon loading* as a *biomarker* for personalized medium-term to chronic exposure to combustion-related ultrafine air pollution.
- *Straightforward* and *flexible* technique applicable to various biological and nonbiological samples.
- *Applications* include *imaging* and *counting* in microfluidic systems.
- A high throughput *demonstrator* is currently *in development*.
- *Strong IP protection* extending to at least 2027.

MARKET POTENTIAL

Worldwide, air pollution is responsible for more than *4 million premature deaths*, which costs the global economy *US\$225 billion*.

The severity of exposure and the measures to effectively reduce the impact of air pollution requires *enhanced probing methods* to gain *up-to-date knowledge* about its impact on human health, ecosystems, environment and climate.

The technique and related results may support an *European* – or even a global – *regulation* regarding the emission of black

OUTSTANDING OPPORTUNITY

Patent applications that are available for licensing: WO2017120647 A1.

Hasselt University and KULeuven are searching for interested parties to complete development and commercialization.

RELEVANT PUBLICATIONS

Bové *et al.* *Nano Lett* 2016

Saenen *et al.* *Am J Respir Crit Care Med.* 2017

Steuwe *et al.* doi.org/10.1002/jbio.201700233

www.youtube.com/watch?v=cX8uGkeETy0

BUSINESS DEVELOPER

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