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Press release

A new Associated International Laboratory on the trail of an 'electronic nose' to sniff out Pulmonary Hypertension

Professor André Syrota, Inserm Chief Executive, and Professor Peretz Lavie, President of Technion, will sign the agreement to create a new Associated International Laboratory (AIL) on 17 December 2013. This artificial 'electronic nose' project brings together Inserm Unit 999 'Pulmonary Hypertension' and the Russell Berrie Nanotechnology Institute Chemical Engineering department, directed by Professor Hossam Haick. This device should be able to differentiate the specific olfactory signatures of certain diseases by analysing the breath. This Franco-Israeli collaboration will focus its research on patients presenting risks of developing Pulmonary Hypertension (PH).

This Associated International Laboratory is added to the current list of 17 AILs and so strengthens the position of Inserm on the international stage. These associations between laboratories enable a team of French researchers and team of foreign researchers to work together on the same project.

André Syrota is pleased with this new collaboration: *"This new AIL is a great example of scientific cooperation based on excellence and the complementary nature of the two research teams".* Professor Peretz Lavie, President of Technion, is delighted by the establishment of this new laboratory, which lays a new brick in the collaboration between Technion and one of the most prestigious institutions in France.

By combining the skills of the French team specialised in pulmonary hypertension with those of the Israeli team in nanotechnology, the aim of the researchers is to finalise the artificial nose.

> *Pulmonary hypertension is defined by a significant increase in pulmonary blood pressure, developing towards heart failure. It affects 15 people per million inhabitants (1 out of 67,000 in Europe). Symptoms initially occur on exertion (breathlessness, chest plain, dizziness).*

This 'electronic nose' (project named NA-NOSE for PH) will be able to tell the difference between a ill person and a healthy person by analysing their breath. This new process will offer the possibility of developing a device that can be used in a clinical setting, capable of detecting markers of the disease in a sample of breath, particularly in asymptomatic patients with risks of developing PH.

"Using this new technology, we will save time compared to current screening techniques that occupy highly qualified staff for a long time, particularly to perform cardiac ultrasound examinations and strength tests". Furthermore, nothing would be possible without the contribution of the Israeli team, which is one of the best in the world for the development of nano-materials, remarks Marc Humbert, director of the Inserm/ Paris-South University joint research unit 999 'Pulmonary Hypertension: physiopathology and Therapeutic Innovation'.

The results of treating patients will then be listed to reduce diagnosis times. The researchers are mobilised to allow doctors to act early and improve the efficacy of the care given.

The researchers hope to define new biomarkers and therapeutic targets in pulmonary hypertension through this Franco-Israeli Associated International Laboratory.

Find out more about the 'NA-NOSE for PH'

This scientific project is focused on several research directions:

- Separate the volatile compounds present in the olfactory signature using the 'electronic' nose and qualify them based on their respective masses (use of gas chromatography coupled with mass spectrometry).

- Search for the presence of proteins needed for olfactory signalling among the components of the pulmonary vascular wall.

- Identify the volatile compounds involved in the PH and analyse their functional role in vascular cells.

- Produce transgenic mice with high expression of functional olfactory receptors on their vascular cells with the goal of analysing the effect of this overexpression on inducing disease.

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Created in 1964, the national institute for health and medical research (Inserm) is a public scientific and technological establishment, overseen jointly by the Ministry for Higher Education and Research and the Ministry of Health. The researchers aim to study all diseases, from the commonest to the rarest, through their work in biological and medical or population health research. Inserm is a member of the National alliance for life sciences and healthcare, founded in April 2009 with CNRS, CEA, Inra, Inria, IRD, the Pasteur Institute, the Conference University Presidents (CPU) and the Conference of regional and university hospital directors.

The mission of the Technion France Association is to promote Technion, Israel Institute of Technology, to enhance its image in France in scientific, industrial and economic circles, and to publicise its achievements and projects in scientific and technological research fields.