AllerTrap. Collecting the invisible to give visible answers

Portable and autonomous device to collect airborne particles in motion

Over 500 million people worldwide suffer allergy symptoms because of the exposure to pollen and fungal spores present in the atmosphere. Moreover, other organisms like bacteria, which may cause many diseases to people, animals and plants, are also transported in the air. As a result, we are breathing daily a huge load of biological particles potentially harmful for our own health.

AllerTrap allow collecting these particles in outdoor areas, where there is a major exposure. AllerTrap is designed for easy installation in any vehicle. The collection occurs in a passive way so a source of power is not needed. The analysis of the collected particles can be carried out by traditional methods of microscopy or molecular approaches. The trials performed with the prototype have shown promising results, especially for the identification of the biological particles by molecular techniques as DNA sequencing.

Technology solution supported by the Technical University of Madrid

Technology solution

Only in Europe, around 20% of the population suffer some kind of allergy to pollen or fungal spores present in the atmosphere throughout the year. Moreover, other organisms like bacteria use the air as a mean for transportation and may cause different diseases as legionnaires' disease or tuberculosis. These organisms not only may harmful to human beings but also to animal and plants, having important consequences for animal husbandry and agriculture at global scale. AllerTrap can easily collect this type of biological particles for further analyses and identification, either by microscopy and culture or by new molecular biology approaches. AllerTrap is an autonomous device (no power required), with a small size and a design especially developed to be coupled in any vehicle: car, bus, train, subway, UAVs,…

Areas of application

- **Health**: Monitoring of organisms with clinical interest outdoors
- **Biotechnology**: Airborne biological particles collectors and identification of them.
- **Agriculture and Environment**: Early detection of airborne pathogens; increase the knowledge of total biodiversity in the atmosphere.

"You can collect the airborne particles to which you are exposed in your itinerary by installing AllerTrap in any vehicle"

Market demands

- **Health**
  - Over 500 M people (100 M from EU) are affected by any type of environmental allergy, with a cost of 45 000 M€ only in the EU.
  - The publication of the European Document CEN/TS 16868:2015 regarding the sampling and analysis of pollen and fungal spores outdoors shows the growing social and health interests in the EU for this matter.

- **Biotechnology**
  - Application of technological advances in new measuring devices and obtaining customized results adapted to the needs of the users.
  - The current devices are designed for sampling indoors, limited by time and way of use, and being dependent on a power source or connection.

- **Agriculture and Environment**
  - Early detection of pests and pathogens spread through the air and affecting crops with high economic value.
  - Around 20-40% of the crop losses are caused by plant pathogens (viruses, bacteria and fungi), many of them transported by the air.
  - Total biodiversity in the atmosphere, their dynamics and geographic and progression are still unknown.

"There is a growing health interest on monitoring airborne biological particles in outdoor environments"

Market potential

- **Health and Biotechnology**
  - Currently there are > 700 stations for monitoring biological particles worldwide.
  - Large biotech companies as MERCK, VWR and CNIM Group have divisions for selling portable devices for biological particles collection in the air.
  - The market of monitoring devices for airborne biological particles invoices > 40 M€/year.

- **Agriculture and Environment**
  - Only in the USA, the losses in crops caused by pathogens are ~ 35 000 M€/year.

Competitive advantages

- Functional prototype developed and tested.
- Up to 50% weight reduction compared with similar devices.
- AllerTrap can be customized according to the needs of the final user. Thus, production costs and sales margins can be arranged by selecting different materials during the production phase.
- Corporate positioning by acquiring a novel technology that provides a solution for the new social and health interests.

References

•The Group BIO-MAT (UPM) has over 30 years of experience in research and has provided technologic advises to more than 25 companies (CAMPSA, Iberdrola, CLH, Cadagua, TALGO, etc.), invoicing a total of > 2M € in research and contracts.

•The Group has also developed other 2 technologies in the field of the Biotechnology with national and international patents.

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IPR

- Patent granted in Spain ES20150031836
- International patent applied via PCT/ES2016/070899

Development stage

- ◯ Concept
- ◯ R & D
- ⊕ Lab Prototype
- ◯ Industrial Prototype
- ◯ Production

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