



New Mass Spectrometry Detector Uses Optically Active Membrane

[View U.S. Patent No. 9,329,126 in PDF format.](#)

WARF: P140174US01

Inventors: Robert Blick, Jonathan Rodriguez, Hyunseok Kim, Zlatan Aksamija, Wolfgang Hansen, Christian Heyn

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a more sensitive mass spectrometry detector that may be used to detect single proteins or other large molecules.

Overview

Mass spectrometers are analytical instruments that can precisely measure the mass of molecules to determine their composition and identity. Generally, the molecules are ionized and then accelerated by an electrical field. One type of system uses a 'time of flight' analyzer in which the relative velocities of different molecular species are determined based on the time it takes them to reach a detector.

Mass spectrometry is commonly applied to very large molecules such as proteins and other biomolecules. However, sensitivity remains an issue because these molecules have large masses and the difference between their velocities is harder to discern.

As a result, the time of flight measurement must be obtained with higher precision. Conventional detectors are limited by measurement delays that can hide small mass differences between large molecules, which has restricted their use in high level proteomics research.

The Invention

UW-Madison researchers and collaborators have developed a mass spectrometry detector that is more sensitive to large molecule impacts and may provide better spatial sensitivity. The detector incorporates a thin membrane made of semiconducting materials. The membrane is optically active, converting the kinetic energy of the molecules that strike its front surface into light photons. The photons are detected and converted to an electrical signal by a photosensor.

Applications

- Detection and analysis of molecules with large molecular mass, such as proteins, peptides or DNA
- Could be packaged into MS systems or sold separately

Key Benefits

- Uses photons as a detection intermediary
- More sensitive
- Potential for single ion detection
- Better spatial sensitivity, which is valuable for sector-type mass spectroscopy

We use cookies on this site to enhance your experience and improve our marketing efforts. By continuing to browse without changing your browser settings to block or delete cookies, you agree to the storing of cookies and related technologies on your device. [See our privacy policy.](#)

OK



WARF
Wisconsin Alumni Research Foundation

| info@warf.org | 608.960.9850

Stage of Development

The researchers have integrated the new detector into their existing mass spectrometers.

Additional Information

Related Technologies

- [WARF reference number P100106US01 describes a mass spectrometry detector that uses a tuned microwave cavity to increase the sensitivity of time measurements.](#)

Tech Fields

- [Analytical Instrumentation, Methods & Materials : Mass spectrometry.](#)
- [Research Tools : Detection](#)

For current licensing status, please contact Jennifer Gottwald at jennifer@warf.org or 608-960-9854

We use cookies on this site to enhance your experience and improve our marketing efforts. By continuing to browse without changing your browser settings to block or delete cookies, you agree to the storing of cookies and related technologies on your device. [See our privacy policy.](#)

OK



WARF
Wisconsin Alumni Research Foundation

| info@warf.org | 608.960.9850