PepTenChip® : Novel Bio-detection System

PepTenChip® is a Biochip for the next generation used for characterization of proteins

Significance

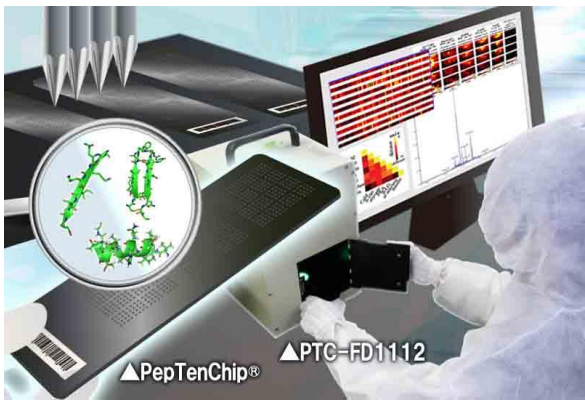
① Biomolecular recognition is structures to structures

② Proteins can be mimicked by peptides.

③ Peptides can be designed and synthesized.

④ Peptides can make 3D-structures.

⑤ The PepTenChip® system does not involve only detection of specific molecules (such as markers) in a 1:1 manner, but also unknown and surrogate markers responsible to diseases can be clarified.



⑥ The detection principle is the differences in fluorescent intensity change of capture peptides caused by analytes.

⑦ The structural change of the analyte-peptide interaction is reflected in the fluorescent-intensity changes of the capture molecules in a dose dependent manner (PAT: JP-US-EU).

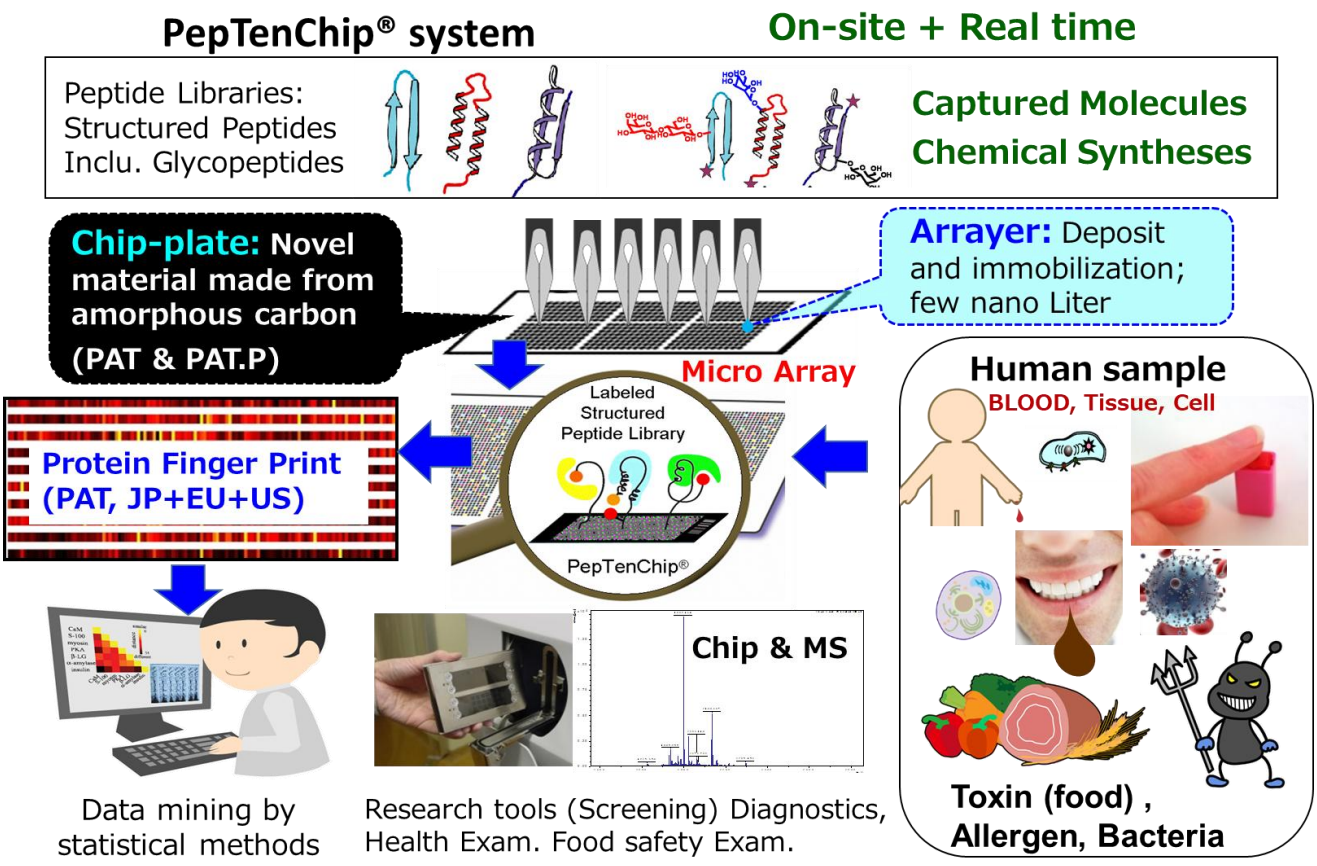
⑧ PepTenChip®, a sensor device, discriminates 3D-structures of proteins

⑨ The novel chip material made from amorphous carbon has been developed, which has significant advantages over conventional glass slides (PAT & PAT.P).

⑩ The PepTenChip® plates are suitable also for array consisting of DNA, sugar, antibody, antigen and low molecular compounds.

⑪ The basic chemical modification of our surface is through a carboxyl group and further derivatization to amino group, bromoacetyl group, succinimide ester, maleimide or biotin-streptavidin is easily achieved.

⑫ The protein can be identified through a data base by the protein fingerprint method (Informatics).

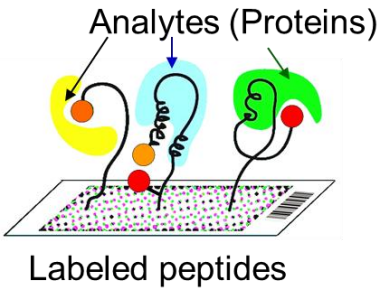


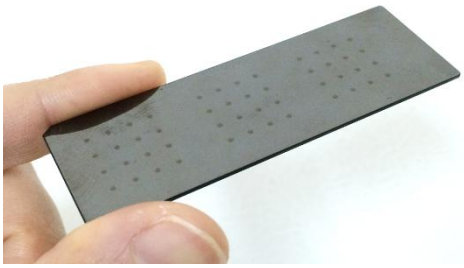
HiPep Laboratories

PepTenChip® : Novel Bio-detection System

PepTenChip® System

- In conventional methods analytes should be labeled, although in the PepTenChip® System capture molecules are labeled. After application of samples washing is not necessary.
- Unlike proteins, peptides can be used after dried. One of advantages in industrial production and higher throughput, saving costs, easier delivery. *Mol. BioSys., 2, 113, 2006*
- Arrayed capture molecules of PepTenChip® are designed peptides, which had been synthesized, purified and characterized. Additionally recognition can be structurally optimized.
- Chip material: The novel material made from **amorphous carbon** has been developed for biochips, which has significant advantages over conventional glass slides as summarized in the next table. (PAT & PAT.P)





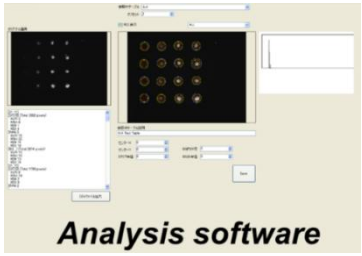
Novel chip materials : Amorphous Carbon and surface technology (PAT.), Quality control(PAT.)

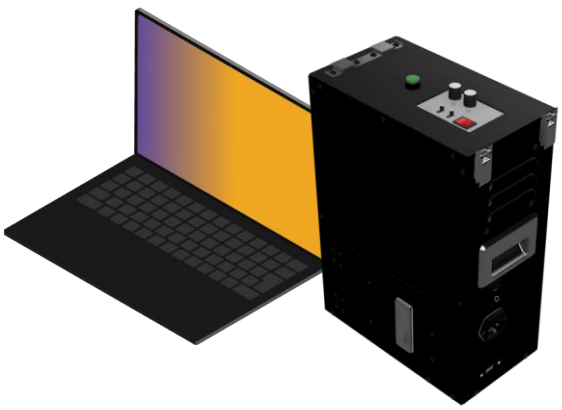
- ◆ No self-fluorescence
- ◆ Chemically inert
- ◆ Higher thermal & electric conductivity
- ◆ It can be used as a sample tray of MALDI-TOF-MS
- ◆ Environmentally friendly (regeneration is easy)
- ◆ Grinding Flatness (<10 micron)
- ◆ Extremely low back ground
- ◆ Lowest non-specific adsorption
- ◆ Mechanically stable (easy handling)
- ◆ Higher stability (storage/transport)
- ◆ Uniformed distribution of functional groups (higher reproducibility)
- ◆ Higher reproducibility + sensitivity for protein detection
- ◆ Many surface chemistry (derivatization with vaiety of functional groups
- ◆ Patented method for Quality control: determination of surface amino groups

Chip & MS Dual Detection

Forte:

① DIN A4 size (ca 5 Liter)
② Easily carried (ca 5 Kg)
③ Power supply allow to stand outside
④Lap-top PC connection with USB
⑤ Field use (carry on baggage size)


Analysis software



Bio-molecular Recognition using Biochip → Medical examination

Research tools, safety control for food, agricultural chemicals, environmental analyses, diagnosis, early detection and prevention of disease, home medical care, on-site examination

- Glycopeptide array showed a different response to the toxin protein. Depending on the type of sugar is different reactivity of the protein. This technology may contribute to the safety inspection of food.
- In world-wide no technologies similar to PepTenChip® are envisaged. Material and surface chemistry are unique.
- Products: chips, related equipment, contract based biodetection and arrays
- Related articles and technical data can be down loaded from HiPep website

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