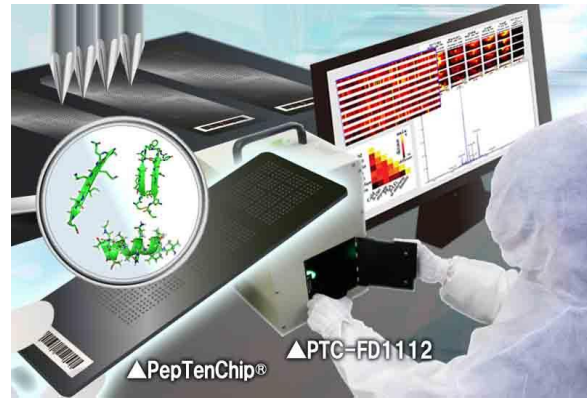


PepTenChip® : Novel Bio-detection System

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

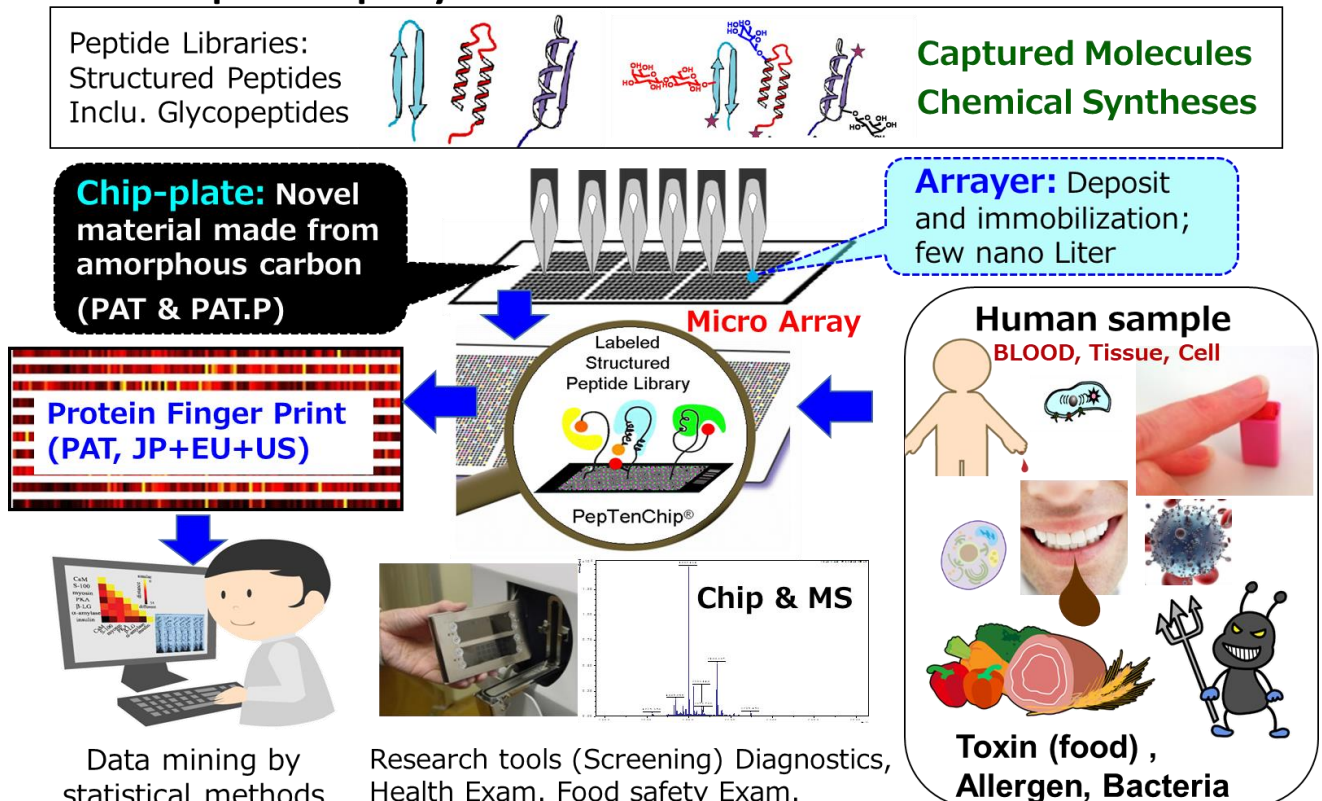
Significance

- 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).



PepTenChip® system

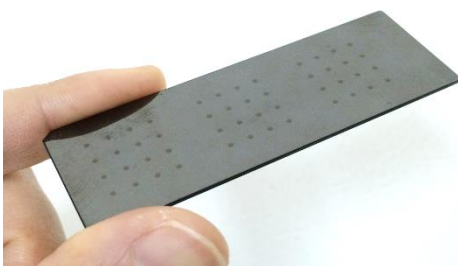
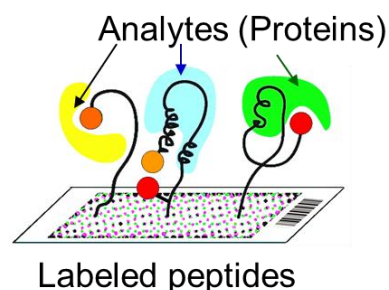
On-site + Real time



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 variety of functional groups)
- ◆ Patented method for Quality control: determination of surface amino groups



**Chip & MS
Dual Detection**

Fluorescence Detector

- Portable, Maintenance free, Easy handling, Space saving
- Scientific CMOS camera
- Image capture software
- LED Excitation
- Filters can be selected by Fluorescent dyes
- Suitable for Bio-Safety-Labs 3 or 4

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

