



Quick assay method in liquid samples

for glyphosate, toxins and pathogens such as viruses or miRNA

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IDEA

Fast and inexpensive on-site analysis for various analytes in liquid samples.

PROOF OF CONCEPT

Highly specific detection of glyphosate in aqueous solutions in the range of 100 pM (corresponds to legal pesticide limits in drinking water of 0.1 µg/l).

NEXT STEPS

Expansion of a platform technology for use in environmental analysis and medical applications through additional biospecific binding partners.



PROBLEM

Existing measurement methods are

- not feasible on-site, but only in the lab (e.g.: ELISA, MS or HPLC)
- cost-intensive
- time-consuming

TECHNOLOGIE / LÖSUNG

We have developed a method for rapid and quick concentration measurement in liquid samples. As a platform technology it enables the detection of toxins, pathogens and other analytes in one device.

1. The surface of hydrogel microparticles is modified with the analyte (or analogs).
2. The transparent chip surface is modified with a natural binding partner.
3. The analyte molecules in solution bind to the chip surface in a concentration-dependent and highly selective manner - in competition with the modified hydrogel particles.
4. Depending on the analyte concentration in the solution, the contact areas of the hydrogel particles on the chip surface vary in size. This enables a highly sensitive optical determination of the analyte concentration.

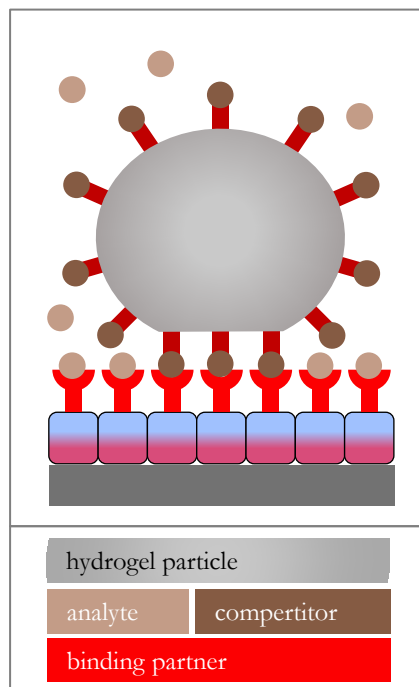


Figure
Schematic detection principle with functionalized hydrogel microparticle and chip surface.

"This measure is co-financed by tax funds based on the budget approved by the members of the Saxon Parliament."



PCT/EP2019/081614

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ADVANTAGES

- On site-determination as small and mobile tool
- Easy handling
- Fast measurement (minutes)
- Highly sensitive
- Highly selective due to biospecific binding (no signal influence by other substances)
- Inexpensive due to simple optical readout method
- Non-toxic and inexpensive consumables
- Platform principle: One measuring device and one chip for each substance
- Expandable for all substances with known binding partners

APPLICATIONS

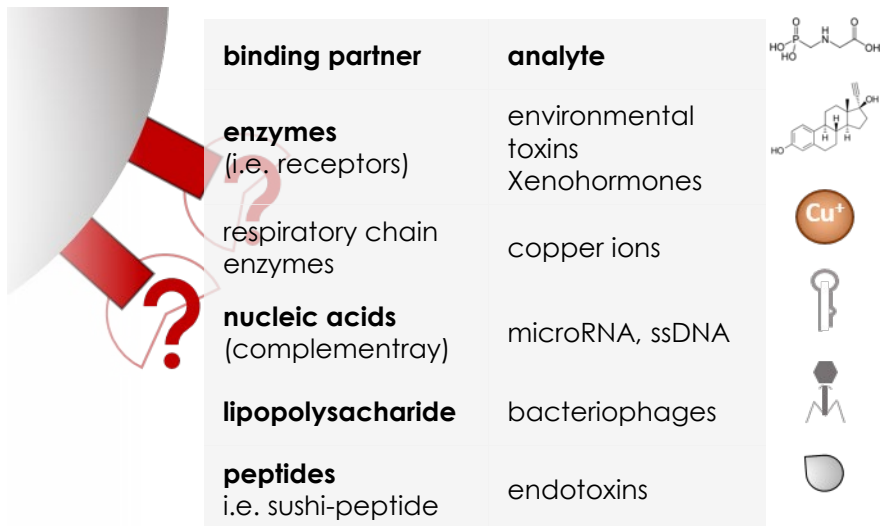
- Concentration determination of
- Glyphosate, estrogens or bisphenol A in environmental samples (in development, patents below).
 - Copper: detection principle confirmed in the laboratory
 - ssDNA or microRNA without PCR in point of care solutions
 - Toxins and pathogens in food, feed, cosmetic or pharmaceutical samples (future)

QUELLEN / LITERATUR

Pussak et al. *Angew. Chem. Int.* (2013)

Rettke et al. *Biosens. Bioelectron.* (2020)

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Figure

Exemplary applications and their binding partners

PATENTS

Applications:

PCT/EP2019/081614

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OPPORTUNITIES

R&D Collaboration

Licensing

Transfer of property rights

NEXT STEPS

IN DEVELOPMENT

Completion of demonstrator

Validations for various analytes

Extension of application

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