One-step homogeneous biodetection assay

PhOCCS Technology
**PhOCCS Targets:**

- ✔ Specific biomarker detection
- ✔ Single mixing & analysis step
- ✔ Fast and simple read-out
- ✔ Small sample volume

<table>
<thead>
<tr>
<th>DNA-based detection</th>
<th>Protein-based detection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Probe-functionalized nanoparticles:</strong></td>
<td></td>
</tr>
<tr>
<td>DNA</td>
<td></td>
</tr>
<tr>
<td>aptamers</td>
<td></td>
</tr>
<tr>
<td>antibodies</td>
<td></td>
</tr>
<tr>
<td><strong>Molecular targets:</strong></td>
<td></td>
</tr>
<tr>
<td>DNA</td>
<td></td>
</tr>
<tr>
<td>miRNA</td>
<td></td>
</tr>
<tr>
<td>Proteins</td>
<td></td>
</tr>
<tr>
<td>Bacteria</td>
<td></td>
</tr>
</tbody>
</table>
Competitive technological advantages

PhOCCS is

- ✔ Simple
  - Single mixing step
  - No rinsing, no grafting, no purification needed
  - Low running cost

- ✔ Fast
  - Incubation < 30 min, read-out < 2 min
  - Serial or parallel multiplexing
  - Works with only few microliters of sample

- ✔ Accurate
  - Picomolar sensitivity
  - High specificity to target molecule
The detection uses the self-assembly of metal nanoparticles via specific probes-target recognition.

The read-out is based on the light intensity scattered by the metal nanoparticles at two different colors (blue and red). The signal is a million times more intense than fluorescence and perfectly photostable.

Coincidence events between detection channels accurately quantifies the presence of the target molecule and is insensitive to background.
Easy manipulation of the sample with no washing steps

Mix target with probes → Incubation: 30 min → Analysis: 2 min

**Set-up**
- Heat 95°C
  - Volume = 100 µl
  - 5 min
- Cooling down at 65°C
- Probe A
- Probe B
- Target DNA
- Dispersion
- Annealing
- 10 µl

All done in a single step homogeneous solution phase
Specific detection of DNA with 1 pM limit of detection

Coincidence vs Concentration of Target DNA

Specific to a single nucleotide mismatch or deletion

LoD 1pM

Background + 3 standard deviation
One-step homogeneous biodetection assay

PhOCCS Technology

Contact IP & technology transfer:
 lhoucine.azzi@sattse.com

Contact technology:
 jerome.wenger@fresnel.fr
 www.jeromewenger.com