Detection of small organics in water
the MUSE project

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- the MUSE project

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Motivation - water quality

17β-estradiol (E2)

Diclofenac

MUSE Multi sensor DVD platform

17.4 MDKK

The Danish Council for Strategic Research

GRUNDFOS
Unisensor
ViroGates
The DVD/Blu-ray setup

Platform

Sampling

Sensing
Raman Spectroscopy
Hotspot explanation

Nanoparticle

Enhancement Factors

2 nm

$10^5$

$10^6$

$10^7$

$10^8$
Surface-Enhanced Raman Spectroscopy (SERS)

Nanoparticles
Our SERS Substrate
Our SERS Substrate
SERS Detection
SERS Detection

Inside droplet

Outside droplet

1 μm
Capturing the Target

Ag/Au SERS  DNA aptamer  17β-estradiol

Raman shift

Intensity

200 nm
Magnetic Nanoparticles

Brownian relaxation = physical rotation of the particle
Magnetic Nanoparticles
Magnetic Nanoparticles
Work in progress