





# Towards the development of new integrated ultrasonic filtration systems for monitoring waterborne pathogens.

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### Abstract:

The detection of waterborne pathogens mainly relies on sample processing. This process concentrates large volume of water to very small volume that can be used under microscopes. The current approved concentration techniques are slow, very expensive, time-consuming and often results in low recovery rates of pathogens. This research explores the use of high frequency sonication which is attached to two different types of filters to improve the recovery rate and work towards automated filtration/elution systems. Both systems were designed and tested with latex beads and live Cryptosporidium parvum oocysts. Results show that the recovery rate has improved by 22% on average when the ultrasonic transducer was used for the beads tests. Also, both systems show higher recovery rates with the use of megasonic energy; about 18% for the tangential flow filtration system and about 12% for the dead-end filtration system.

### **Biography:**

Abdelfateh Kerrouche received his PhD degree in Measurement and Instrumentation from City University London in 2009. He is a Lecturer and Sensors/Systems Consultant at Edinburgh Napier University. He has published more than 15 papers in reputed journals and international conferences. His area of interest includes: Pathogen detection, Sample prepearation, Sensors and Aquaculture.

#### **Publication of speakers:**

- 1. A Kerrouche et al; Luminescent solar concentrators: From experimental validation of 3D ray-tracing simulations to coloured stained-glass windows for BIPV.
- 2. A Kerrouche et al; Strain measurement on a rail bridge loaded to failure using a fiber Bragg gratingbased distributed sensor system
- 3. A Kerrouche et al; Design and in-the-field performance evaluation of compact FBG sensor system for structural health monitoring applications
- 4. A Kerrouche et al; Field tests of fibre Bragg grating

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sensors incorporated into CFRP for railway bridge strengthening condition monitoring

- 5. A Kerrouche et al; Strain measurement using embedded fiber Bragg grating sensors inside an anchored carbon fiber polymer reinforcement prestressing rod for structural monitoring
- 6. A Kerrouche et al; Enhanced FBG sensor-based system performance assessment for monitoring strain along a prestressed CFRP rod in structural monitoring
- 7. A Kerrouche et al; The search for building-integrated PV materials with good aesthetic potential: a survey.
- A Kerrouche et al; Improving the aesthetics of 8. photovoltaics through use of coloured encapsulants
- 9. A Kerrouche et al; Creative use of BIPV materials: barriers and solutions
- 10. A Kerrouche et al; Monitoring of drinking water quality using automated ATP quantification

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