

# Invitational Workshop Biosensors for Monitoring Arsenic in Water

**Date** 26-27 October 2005

Venue Research Centre for Environmental Technology and Sustainable Development (CETASD) Hanoi University of Science Hanoi, Vietnam

Organisers CETASD, Hanoi University of Science, Vietnam University of Lausanne, Switzerland

Information www.unil.ch/arsenicsensors

This workshop is financed by the Swiss Agency for Development and Cooperation (SDC).



### SCOPE

Whole-cell bacterial biosensors have been shown to be valuable tools for measuring arsenite and arsenate in potable water. They are inexpensive, easy to apply and provide accurate and reliable measurements in short time. Features which make the analysis of arsenite and arsenate simple and comfortable.

In this intensive, hands-on workshop you will learn how the different sensor types are produced and applied. Thanks to an expert team you will acquire the knowledge and skills to apply biosensors immediately in your own laboratory.

In addition, this two-day workshop will provide a unique platform to discuss the current status of arsenic mitigation in Vietnam and to consider the pros and contras of existing arsenic tests with a panel of experts.

## **OBJECTIVES**

- (1) To provide background information on arsenic contamination of potable water in Vietnam.
- (2) To highlight the main strategies in arsenic testing in Vietnam.
- (3) To gain a basic understanding of the production, utilisation, quality control, and storage of whole-cell bacterial sensors.
- (4) To provide an intensive training in the skills required for the application of arsenic biosensors.
- (5) To foster cooperation and knowledge sharing among the workshop participants.

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The workshop is addressed to all those working in water supply, water quality and environmental monitoring. Lectures held on Wednesday morning, October 26, are open for everyone.

Due to space limitation, only invited guests can be admitted to the laboratory training. Participants of the laboratory training are requested to attend the workshop on both days.

#### **ACCOMODATION & TRAVEL** –

Hotel reservations will be made by the workshop organisers.

Workshop participants are responsible for their own travel to the hotel. Travel costs will be reimbursed upon presentation of an original receipt. Please make your bus, train and airplane reservations as early as possible.

A shuttle bus will provide transportation from the hotel to CETASD.

# ---- PROGRAM

#### Wednesday, 26 October 2005

TIME	TOPIC	SPEAKER
8:30 AM	Welcome and opening address	Delegates from Ministry of Natural Resources and Environment ( <b>MONRE</b> ), Hanoi University of Science ( <b>HUS</b> ) and <b>CETASD</b>
9:00 AM	Arsenic contamination of drinking water in Vietnam - assessing the potential magnitude and severity of the problem	Pham Hung Viet CETASD, Vietnam Michael Berg EAWAG, Switzerland
9:30 AM	Policies and guidelines for arsenic testing in Vietnam	Delegate from Rural Clean Water Supply and Sanitation in Vietnam ( <b>CERWASS</b> ), Ministry of Agriculture and rural Development (MARD)
9:45 AM	Break	
10:00 AM	Engineering of bacterial biosensors	Jan Roelof van der Meer University Lausanne, CH
11:00 AM	Prototype of a biosensor-based arsenic test strip	Hauke Harms UFZ Centre for Environmental Research, Germany
12:00 AM	Lunch break	
1:30 PM	Arsenic biosensors - production, application, storage	<b>Jan Roelof van der Meer</b> University Lausanne, CH
2:30 PM	Laboratory training & demonstrations	
	<ul> <li>Group A and B:</li> <li>Start test incubations of ß-galactosidase and GFP (Green Fluorescent Protein) biosensor</li> <li>Chemical pretreatment of real water samples</li> </ul>	
6:00 PM	<ul> <li>Group A:</li> <li>1. Arsenic measurements with the ß-galactosidase biosensor</li> <li>2. Visualisation of the GFP biosensor by epifluorescence microscopy</li> </ul>	<ul> <li>Group B:</li> <li>1. Visualisation of the GFP biosensor by epifluorescence microscopy</li> <li>2. Arsenic measurements with the ß-galactosidase biosensor</li> </ul>
6:00 PM	UINNER	

#### Thursday, 27 October 2005

TIME			
8:30 AM	Laboratory training		
	<ul> <li>Group A</li> <li>Quantitative arsenic measurements with the luciferase biosensor</li> </ul>	<ul> <li>Group B</li> <li>Quantitative arsenic measurements with Atomic Absorption Spectroscopy (AAS)</li> </ul>	
12:00 AM	Lunch break		
1:00 PM	<ul> <li>Group A</li> <li>Quantitative arsenic measurements with Atomic Absorption Spectroscopy (AAS)</li> </ul>	<ul> <li>Group B</li> <li>Quantitative arsenic measurements with the luciferase biosensor</li> </ul>	
4:30 PM	Break		
4:45 PM	<ul> <li>Round table discussion</li> <li>Interpretation and discussion of results</li> <li>Future strategies in arsenic testing - is there a market potential for biosensores?</li> <li>Chair: Pham Hung Viet</li> <li>Rapporteur: Jan Roelof van der Meer</li> </ul>		

#### **Program Committee**

**Jan Roelof van der Meer** University of Lausanne Lausanne, Switzerland

**Pham Hung Viet** CETASD, Hanoi University of Science Hanoi, Vietnam

**Michael Berg** Swiss Federal Institute of Aquatic Science and Technology Dübendorf, Switzerland **Barbara Baumann** University of Lausanne Lausanne, Switzerland

**Pham Thi Kim Trang** Biology Faculty, Hanoi University of Science Hanoi, Vietnam