

November 2007



BEN GURION UNIVERSITY
ZUCKERBERG INSTITUTE FOR WATER RESEARCH
DEPARTMENT FOR DESALINATION AND WATER TREATMENT

Biofouling and Quorum Sensing

A Marie Curie TOK- MEMBIOF course



By

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The course will be held at the Zuckerman Institute for Water
Research, the BGU Sede Boker campus in
December 2007, 16 to 26.

Coordinators: Dr. J. Gilron, 052-4684138, jgilron@bgu.ac.il

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**For information and registration (deadline 11.12.07),
please contact Mrs. Vanessa Tzabari, 08-6563502,
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Transportation to Sede Boker and Beer-Sheva will be provided.

Course Syllabus

Introduction

- The relevance of biofouling to water treatment processes
- Consortia in which several organisms would jointly metabolize materials;
- Microenvironments (often very important in biofilm-induced corrosion);
- Bacterial cell surfaces can influence events
- Sketch on where affinity chromatography (magnetic beads) and quorum sensing inhibition could fit into the scheme of water purification

Introduction on bacteria

Their structure, their genetic ability to mutate, allowing them to survive in most adverse environments.

The problem: bacterial resistance to antibiotics and disinfectants:

- Inherent resistance
- Biofilm resistance

Quorum Sensing

Cell to cell communication: Quorum sensing (QS)

- What is QS
- How can QS molecules be discovered
- Functional genomics (proteomics and microarray) as tools to study the molecular effects of quorum sensing
- Quorum sensing in Gram-negative bacteria (AHL-mediated)
- Quorum sensing in gram-positive bacteria (polypeptide-mediated)
- Inhibition of quorum sensing by quorum sensing inhibitors (QSI)

Laboratory Activity

Basics in biofouling growth and observation.

Activation and inhibition of quorum sensing.

Inhibition of Biofilm using QSI.

Course Timetable, December 2007

	Mon	Wed	Mon
	17	19	24
Morning	<u>Lecture</u> 10:00-12:00	Lecture 10:00-12:00	<u>Lecture</u> 10:00-12:00
Afternoon	<u>Lecture</u> 14:00-15:00	<u>Lab</u> 14:00-16:00	<u>Lab</u> 14:00-16:00
	<u>Lab</u> 15:00-16:00	Classroom meenot – 60 people	<u>Closing remarks</u> 16:00- 17:00