
BioMEMS Overview Assessment

Instructor Guide

Notes to Instructor

This Final Assessment evaluates the participant's knowledge on the emergence of bioMEMS from microtechnology and on the possible applications of bioMEMS.

This assessment could be used as both a pre-test and post-test. This would provide information on what was learned as a result of completing the supporting PK and activities.

This assessment SCO is part of the bioMEMS Overview Learning Module.

- BioMEMS Overview
- BioMEMS Overview Activity
- **BioMEMS Overview Assessment**

This assessment is presented as a hand-out (see Participant Guide - PG). Participants and instructors can download the most recent version of this PG from scme-nm.org. Select “Educational Materials” in the side menu.

This companion Instructor Guide (IG) contains both the questions and answers for the assessment questions. The Instructor Guide booklet contains this IG followed by the Participant Guide (PG) assessment which contains only the questions. The most recent version of the IG can be downloaded from scme-nm.org by registered users.

Introduction

The purpose of this assessment is to determine your knowledge on bioMEMS and how they have evolved. It will also assess your knowledge on how we will benefit from further development of bioMEMS.

There are ten (10) assessment questions.

1. List three characteristic of MEMS devices.

Answer: contains a MEMS component, uses biomolecules, can be used in vivo, in vitro or both, has at least one component with a dimension in the 100 micrometer to 100 nanometer range.

2. One of the differences between MEMS and bioMEMS is that bioMEMS may use _____ for actuation, detection and analysis.

- a. Thin films
- b. Red blood cells
- c. Biomolecules
- d. Human tissue

3. List five categories of bioMEMS applications

Possible answers:

- a. Detection
- b. Clinical Laboratory Analysis
- c. Diagnostics
- d. Therapeutics
- e. Drug Delivery
- f. Cell Culture
- g. Monitoring
- h. Screening
- i. Surgical Procedures
- j. Environmental Monitoring

4. List five potential advantages for the development of bioMEMS.

Possible Answers:

- a. Smaller devices for monitoring and diagnostics
- b. Less invasive devices for testing and surgery applications
- c. Point of care devices for home use and remote areas
- d. 24/7 monitoring
- e. Faster and more accurate diagnostics
- f. Lower costs due to size and use
- g. Other answers are possible

5. One of the constraints of some bioMEMS is that, if implanted, that it is not rejected by the host. Thus, to prevent host rejection, in vivo bioMEMS must be _____.

- a. Biofouling
- b. Biocompatible
- c. Biosensitive
- d. Biomolecular

6. What is it called when the body prevents an implanted bioMEMS from functioning properly?
 - a. **Biofouling**
 - b. Bio-incompatible
 - c. Bio-insensitive
 - d. Biointerference
7. Which of the following bioMEMS is considered a monitoring and therapeutic device?
 - a. ECG chest patch with heart monitor and transmitter
 - b. LOC with micropump and biosensors
 - c. **MiniMED glucose sensor and micropump**
 - d. BioLOCS's CD-ELISA
8. Which of the following fields of microtechnology has greatly enabled the development of POC and LOC devices?
 - a. **Microfluidics**
 - b. Micro-optics
 - c. RF transmission
 - d. Mechanical actuation
9. Biosensors are capable of identifying specific _____ within a sample.
 - a. DNA
 - b. Cells
 - c. **Analytes**
 - d. Fluids
10. Which of the following is the major drive for the development of LOCs?
 - a. A small and compact measuring device
 - b. **Being able to be used in remote areas**
 - c. Cost effectiveness
 - d. Ease of use by doctors and nurses

This Learning Module was developed in conjunction with Bio-Link, a National Science Foundation Advanced Technological Education (ATE) Center for Biotechnology @ www.bio-link.org.

Support for this work was provided by the National Science Foundation's Advanced Technological Education (ATE) Program through Grants. For more learning modules related to microtechnology, visit the SCME website (<http://scme-nm.org>).