

Guided Module on Biofilms

This completed activity sheet demonstrates the use of research, writing, and learning skills in analysing concepts associated with the topic of biofilms.

Subject / Course: Biology / SBI4U

Grade Level: Grade 12

Topic: Biochemistry - Antifungal and Antimicrobial Activity

Specific Curriculum Expectations Met:

- A1.1 formulate relevant scientific questions about observed relationships, ideas, problems, or issues, make informed predictions, and/or formulate educated hypotheses to focus inquiries or research
- A1.8 synthesize, analyse, interpret, and evaluate qualitative and/or quantitative data to determine whether the evidence supports or refutes the initial prediction or hypothesis and whether it is consistent with scientific theory; identify sources of bias and/or error; and suggest improvements to the inquiry to reduce the likelihood of error
- A1.9 analyse the information gathered from research sources for logic, accuracy, reliability, adequacy, and bias
- B2.1 use appropriate terminology related to biochemistry, including, but not limited to: *active transport, covalent and ionic bond, allosteric site, substrate-enzyme complex, and inhibition* [C]
- C1.1 analyse the role of metabolic processes in the functioning of and interactions between biotic and abiotic systems (e.g., specialized microbes and enzymes in biotechnological applications to treat wastewater in the pulp and paper industry; microbes and enzymes in bioremediation, such as in the cleanup of oil spills; energy transfer from producers to consumers) [A1, C]

Required Resources:

- Data projector
- Guided module
- One copy of the Journal *Evaluation of the Antimicrobial Activity of Extract from Buntan Fruit Peel* per student
- One copy of the student assignment that accompanies the article per student
- Instructor solutions – included in this package

Content and Teaching Strategy of Lesson:

- **Overview:** Introduce concept of Journal Articles to students
- **Introduction:** Demonstrate the Memory Metal as an introduction to nanoscience
- **Teaching Strategies:**
 1. Guide students through the “How to Effectively Use a Journal Article” PowerPoint Presentation – provide students with an opportunity to practice paraphrasing
 2. Walk students through the Guide to University Learning to facilitate effective reading strategies
 3. Students read the article *Evaluation of the Antimicrobial Activity of Extract from Buntan Fruit Peel* and respond to questions in handout
- **Consolidation:** Students review answers with each other and instructor; share paraphrasing strategies; connect content in research article to both knowledge of biochemistry methods.

Title of article analysed: *Timofiychuk, O.A., Prudnicova, T.I., Mishurov, D.O., Avramenko, V.L., & Shevcova, R.G. (2009). Decomposition of Biodegradable Films Developed on the Basis of Polyvinil Alcohol in the Natural Environment. Physics, Chemistry and Technology, 7, 61-67.*

The goal of this exercise is to highlight and demonstrate the transition in Research, Writing and Learning Skills that a student might encounter during the transition from high school to post-secondary education.

- a. *We have provided all the necessary links to the activity on this site. This activity is to be used in conjunction with the downloadable [student template](#)*

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Step 1. Getting the Article

- a) Go to the [research module](#) in order to gain access
 - b) Type in the search terms “biodegradable” AND “films”
 - c) Select above article
- Or
- a) Go to the [Directory of Open Access Journals](#) and select find articles
 - b) Type in the search terms “biodegradable” AND “films”
 - c) Or type in the name of the journal article
 - d) Select above article

Step 2. Reading the article

- a) Reading material, highlighting and taking good notes are important skills required in post-secondary education. In order to get an idea of what is required of your students, take them through our [Guide to University Learning activities](#) .

Step 3. Filling out the student template

- a) Plagiarism concerns are highlighted in this exercise. In order to address this concern, take your students through the [Paraphrasing exercise](#).

For a complete solution of this module please email: learning@uoguelph.ca