

# 10th IYNT 2022; Tskneti, Georgia

## Problem 4. *Microscopic Swimmers*

Reviewer: David Bratucu  
Team Romania - Limitless 3.0

21-28 August 2022

## Problem statement:

Investigate experimentally and theoretically the **locomotion** of **bacterial or eukaryotic cells** that use **natural flagella** to move in a liquid.

# Report

Strong points	Weak points
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- 1. Good explanation of structure of the eukaryotic flagellum.
- 2. Performed the experiments multiple times.
- 3. Good use of specific software
- 4. She managed to answer the questions during the discussion

- 1. No definition for the average curvilinear velocity
- 2. Did not consider **any other types of cells**
- 3. Did not explain why the **velocity varies after the thaw.**
- 4. Did not explain the mathematical methodology for calculating velocity
- 5. No hypotheses presented.
- 6. Did not vary parameters!
- 7. Did not specify the medium in which the experiments were performed
- 8. Did not explain clearly what happens in the phenomenon

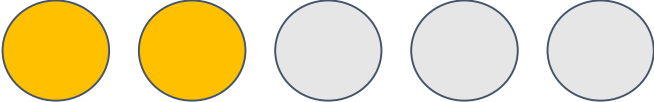
Theoretical Part



Experimental Part

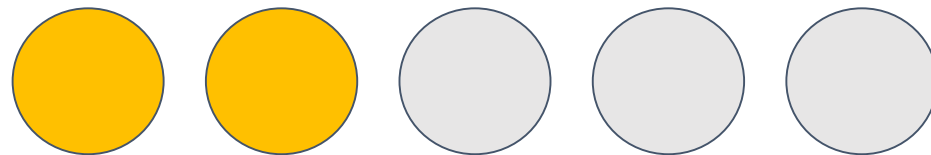


Conclusions



# Opposition

<b>Strong points</b>	<b>Weak points</b>
<ol style="list-style-type: none"><li>1. Asked relevant questions about the theoretical part</li><li>2. Draw attention to the lack of phenomenon explanation (physics area)</li><li>3. He presented improvements to the problem, by adding the liquid viscosity factor .</li></ol>	<ol style="list-style-type: none"><li>1. Missed out on reporter mistakes</li><li>2. Did not give enough weak/strong points</li><li>3. Did not have good time management in the discussion</li><li>4. He did not ask enough questions during the discussion.</li></ol>



# Discussion topics

**1. *Opp:*** Discussion around ATP and ADP

***Rep:*** Clearly explained the physics behind the movement of the cell  
*We agree with the Opponent!* ADP is produced on hydrolysis of ATP, creating energy needed for locomotion.