

Biochemical Society

Diversity in Science Grant

Exploring the world through a microscope

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The project aimed at introducing high school girls from one of Jordan's disadvantaged regions [the Northwest Badia (desert)] in the city of Mafraq to the world of cells and microscopy.

We (Prof. Lubna Tahtamouni and two research assistants) visited three girls' high schools in the region, bringing a brightfield microscope, microscope slides, coverslips, cell stains like methylene blue, onions, and toothpicks, and demonstrated how to prepare slides of stained animal (inner cheek cells) and plant (onion skin) cells, as well as how to use a brightfield microscope. Furthermore, I welcomed eight high school girls

from the same region in my lab at the Hashemite University, Zarqa-Jordan, and showed them how to do the same, preparing stained cells and learning about cellular structures.

During our visits, each set of students received a tutorial on the proper use of a microscope, as well as a brief explanation of cells and cellular structures. The vast majority of girls were completely competent in handling the microscope correctly. Several girls told us that looking at cells under a microscope was one of the most enjoyable things they had done in school thus far. Allowing these girls to make their own slides with their own cells and teaching them how to use the microscope encouraged critical thinking and fostered an interest in STEM topics. Seeing things from such angles altered their perspectives and thoughts about the world around them. The girls wanted to examine various objects under the microscope, such as a flower petal, an insect, and a drop of blood. This, in turn, let them feel connected to their surroundings and to the

rest of the living world, as we are all composed of cells. It also increased their curiosity for the natural world.



For many of these young girls, learning about cells and cellular structures by allowing them to perform such a simple experiment, was far more beneficial than learning it in theory only. Giving young students the opportunity to conduct hands-on activities using microscopes demonstrates that science is not limited to the pages of a textbook. When the girls viewed their cells this close, understanding science became more fascinating and real because they were able to discover new things and understand how every living thing is made up of cells. This made them feel like little

scientists while also providing them with an enjoyable learning experience. For them, using a microscope was like solving a mystery, which fueled their scientific curiosity, and it is curiosity that distinguishes scientists from ordinary people!

As for future plans, the project will not end by the end of the grant period.

We are now submitting proposals to several funding organizations in order to generate supports to ensure the long-term sustainability of this initiative and to expand our work



to other areas of Jordan to include new educational regions, schools, and girls. The ultimate goal is to rent/purchase a truck and equip it with everything required for this experiment, such as chargeable lightweight microscopes or even paper microscopes that can be assembled on the spot, as well as other equipment to perform simple experiments such as DNA electrophoresis,

chlorophyll Thin-Layer Chromatography (TLC), and osmosis (dialysis tubing), thereby increasing the impact.