



## Posters

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veterinary uses and it became a subject of interest for many biotechnological and industrial applications, while wax esters show features of potential alternative biofuels. Despite increasing interest in these products, information about the metabolism of paramylon is still limited to analyses of transcriptomes of the model organism *E. gracilis*, which allowed identification of key enzymes of its metabolism. In the hydrolytic process of paramylon degradation in *E. gracilis*  $\beta$ -1,3-glucanases as well as  $\beta$ -1,3-glucan phosphorylase are participating, with only three and two available amino acid sequences, respectively. In our project, we focused on the *in silico* identification of hydrolytic enzymes which can be potentially involved in the process of paramylon degradation in other Euglenozoa species (euglenids as well as kinetoplastids). Using Hidden Markov model of the catalytic domain of individual enzyme specificities built from characterized enzymes of different sources we were able to assemble candidate enzymes data sets. Comparative analysis of amino acid sequences allowed us to determine the structural and functional characteristics of enzymes involved in the paramylon metabolic pathway. Moreover, analysis of signal peptide and transmembrane motifs content enabled us to predict the localization of enzymes in the cell. Due to the limited sequence data available, our findings can contribute to a better understanding of this specific carbohydrate metabolism process in Euglenozoa microorganisms.

#### 7PO.13

##### ADAPTIVE RESPONSE OF *CHLORELLA SOROKINIANA* TO IONIZING RADIATION ON THE LEVEL OF CELL WALL

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Microalgae are exposed to ionizing radiation from natural (e.g. radionuclides from the soil) and anthropogenic sources (such as radioactive waste, nuclear power accidents, etc). However, the mechanisms of adaptation to radiation are poorly understood. The aim of our study was to determine the effects of X-ray irradiation on the cell wall of *Chlorella sorokiniana*.

*C. sorokiniana* (CCAP 211/8K) culture was grown in 3N-BBM+V medium, at 22°C with a continuous photon flux of 120  $\mu\text{mol m}^{-2} \text{s}^{-1}$  for 20 days, reaching stationary phase. Cultures were then exposed to X-rays at doses of 1, 2 and 5 Gy, left under the same conditions for additional 24 h, and analyzed using TEM (postfixation with 1% osmium tetroxide, embedded in resin for soft blocks, and stained with uranyl acetate and lead acetate), and gravimetry. The analysis of TEM micrographs showed that there were no significant changes in the thickness of trilaminar sheath for any of the used doses. However, the diameter of the fibrillar wall was increased in response to irradiation: 105.5  $\pm$  7.5 nm for untreated samples vs. 135.0  $\pm$  9.5 nm ( $p = 0.015$ ) for microalgae exposed to 1 Gy, and 127.9  $\pm$  7.4 nm ( $p = 0.036$ ) for exposure to 2 Gy. The thickness of the cell wall in microalgae exposed to 5 Gy (118.6  $\pm$  8.6 nm) was not significantly different than in controls. A similar trend was observed by gravimetry of dry cell wall isolates normalized to biomass. It is important to note that no effects of radiation on biomass, at doses applied here, could be observed. It appears that *Chlorella sorokiniana* responds promptly to ionizing radiation by fortifying its 'first line of defense'. The observed changes may be of particular interest for bioremediation, taking into account the capacity of the cell wall to bind water-soluble metals, including radionuclides.

#### 7PO.14

##### THE INFLUENCE OF SELENITE ON GROWTH AND ANTIOXIDATIVE RESPONSE IN GREEN MICROALGA *MONORAPHIDIUM CF. CONTORTUM*

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Selenium (Se) is a trace element that appears in nature in different organic and inorganic forms. It affects organisms in a dosage-related manner being essential at low and toxic at higher concentrations, depending on its chemical form and different environmental factors. Potential toxicity lies in the ability of Se uptake and biotransformation by primary producers, particularly microalgae, and subsequent transport along the aquatic food chains. This study aimed to determine the antioxidative status of