Report on the 2023 International Human Peroxidase Meeting

The International Human Peroxidase Meeting was held for the 12th time in Budapest, August 30 - September 2, 2023. Due to the Covid-epidemic periods of recent years, the last stop of this conference series, which was previously organized every two years, took place in 2019 in Brno, Czech Republic. At the Brno conference, Professor Miklós Geiszt was asked to organize the next conference. The impressive halls of the Festetics Palace, located in the center of Budapest, on Pollack Mihály Square, served as an excellent venue for the event. Researchers, including group leaders, postdocs and PhD students from more than ten countries on 4 continents came to present their presentations and posters. This meeting also provided many young Hungarian researchers working in the field with the opportunity to participate. In eight sessions, the participants could listen to a total of 33 lectures and 10 posters were presented during the poster session.

A brief overview of the peroxidase enzymes that were the subject of the conference: Animal heme peroxidases have several important functions, for example myeloperoxidase, eosinophil peroxidase and lactoperoxidase serve in host defense against different pathogens. The role of thyroid peroxidase in the synthesis of thyroid hormones is a well-known and indispensable element of thyroid hormone production, while the role of peroxidasin in the formation of collagen IV cross-links in the matrix between cells has become known over the last decade.

At the opening on Wednesday evening, Miklós Geiszt greeted the participants, and then Michael Davies gave his opening lecture on the role of chlorination and nitration processes by myeloperoxidase in cardiovascular diseases. Afterwards, the participants could greet each other during a standing room reception in the inner courtyard of the palace. The first session on Thursday morning focused primarily on the physicochemical properties, structural and interaction properties of peroxidase enzymes. After a coffee break and a short informal conversation, in the second section we had presentations that dealt with enzymes that produce hydrogen peroxide for peroxidases, primarily NADPH oxidases. After the lunch presented on site the afternoon session began, where the properties, biological effects, and role played by the reactive compounds produced by peroxidases in physiological and pathological processes were discussed. In the first session on Friday morning, the focus was on the tumor biological and vascular effects of myeloperoxidase and peroxidasin, while in the late morning session translation possibilities related to peroxidase enzymes and various disease states were presented. Friday's lunch was followed by an hour and a half poster session, which was again a great opportunity to continue informal professional discussions between the research groups. The Friday afternoon session was also about disease states and disease processes related to peroxidases and oxidases, the main topics were atherosclerosis, pulmonary fibrosis, and the formation of white blood cells. The Friday evening was closed by a wine tasting and dinner organized at the conference venue, as well as a jazz concert that created an excellent atmosphere. The first session on Saturday morning focused primarily on the role of peroxidases in defense against microbes and wound healing, while the last session of the conference focused again on the translational potential of the field, closing the conference with presentations on the investigation and development of different peroxidase inhibitors. At the end of the conference, Professor Miklós Geiszt thanked the attendees for their work and active participation, as well as the sponsors' contribution to the organization of the event. Based on the meeting’s presentations, it is expected that in the near future the knowledge of cell biology, biochemistry, physiology and pathology related to peroxidases will increase by leaps and bounds, thanks to the numerous high-throughput, genetic and proteomic testing techniques, the increasingly available animal models and data from human patients.