

XV International Symposium on Inorganic Biochemistry  
*New arrivals on Stage*  
10-13 September 2025 Wrocław, Poland

# XV International Symposium on Inorganic Biochemistry

## *New Arrivals on Stage*



## Book of Abstracts

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Book of Abstracts**

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**2025 Wrocław**

Dear Friends and Colleagues,

It is our great pleasure to welcome you to Wrocław for the XV International Symposium on Inorganic Biochemistry (ISIB). The 2025 edition proudly continues the tradition of the previous symposia, which began 40 years ago in Karpacz, thanks to the vision and efforts of Professor Henryk Kozłowski.

Over the years, the fourteen preceding meetings have been a remarkable success, bringing together leading researchers from around the world. They have focused on key areas at the intersection of inorganic, coordination, and bioinorganic chemistry with biology and medicine. Among the central topics have been chemical structure and thermodynamics, solution equilibria and metal–biomolecule interactions, transport, homeostasis and toxicity of metals in disease, as well as the development of metal-based therapies and diagnostics.

This year's symposium continues this mission, offering a forum for valuable discussions on recent advances in these areas. Alongside plenary and invited lectures, participants will have the opportunity to share their work through flash presentations and poster session. We believe that the scale of this year's meeting—around 80 participants, reflecting the 80th birthday of Professor Henryk Kozłowski—will encourage informal and stimulating exchanges between experienced scientists and younger colleagues. Promoting new collaborations among researchers with complementary expertise and goals is one of our key ambitions.

This year, under the subtitle “New Arrivals on Stage”, we are delighted to welcome a number of first-time speakers to the ISIB community, while also expressing our gratitude to our long-standing friends whose continuous support has sustained the symposium for many years.

We are truly happy to host you in Wrocław.  
Let us enjoy the science together!

The Organizers

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**Thermodynamic and spectroscopic analysis of peptide-based enzyme mimics containing the ATCUN site**

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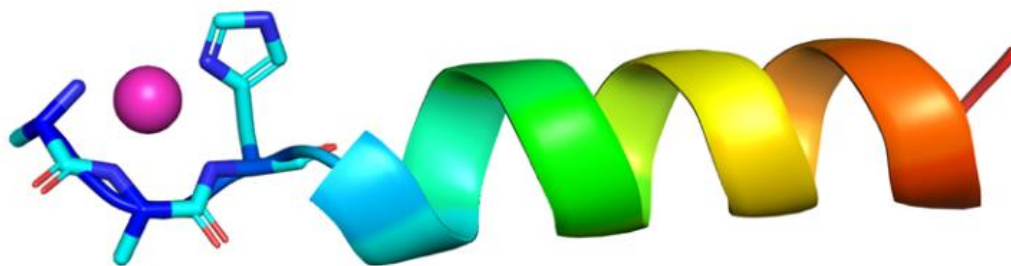
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Enzyme mimics (EMs) are molecular entities that typically replicate the binding and catalytic function of natural enzymes [1]. In this work we focus on peptide-based EMs with an ATCUN (Amino-Terminal Copper and Nickel) binding site, in order to promote a multitarget antimicrobial mechanism. Our approach in designing novel EMs relies on synthetic branched peptides to generate a previously unexplored category of EMs. A biocompatible central scaffold serves as the core of the EM structure, to which various oligopeptides can be attached [2,3]. The presented work consists of a preliminary study of two selected oligopeptides: AAHAWG-NH<sub>2</sub> and AAHAWGELLKKLLEELKG-NH<sub>2</sub>. The peptide ability to form stable Cu(II) complexes has been investigated, together with the ability to generate reactive oxygen species. Indeed, the presence of an ATCUN motif can lead to an increased antimicrobial power, due to copper catalytic action. Potentiometric titrations, mass spectrometry and different spectroscopic techniques (e.g. UV-Vis absorption, circular dichroism) have been employed to thoroughly study the metal interaction with the selected peptides (Figure 1).

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**Figure 1:** Coordination and structure hypothesis for the Cu(II)/AAHAWGELLKLLLEELKG-NH<sub>2</sub> complex.

#### References:

- [1] Tegoni, M., De Novo Designed Copper  $\alpha$ -Helical Peptides: From Design to Function. *Eur. J. Inorg. Chem.* **2014**, 2014, 2177-2193.
- [2] Perinelli, M.; Guerrini, R.; Albanese, V.; Marchetti, N.; Bellotti, D.; Gentili, S.; Tegoni, M.; Remelli, M., Cu(II) coordination to His-containing linear peptides and related branched ones: Equalities and diversities. *J. Inorg. Biochem.* **2020**, 205, 110980-110993.
- [3] Calo, G.; Rizzi, A.; Ruzza, C.; Ferrari, F.; Pacifico, S.; Gavioli, E. C.; Salvadori S.; Guerrini, R., Peptide welding technology - A simple strategy for generating innovative ligands for G protein coupled receptors. *Peptides* **2018**, 99, 195-204