Swiss Industrial Chemistry Symposium 2026

Short peptides as next-generation chelating agents for treating Wilson disease

Michal Shoshan

Department of Chemistry, University of Zurich and metaLead Therapeutics AG

Wilson disease (WD) is a rare, recessive disorder of copper metabolism caused by mutations in the ATP7B gene, resulting in toxic copper accumulation in tissues. Current treatments, including D-penicillamine, trientine, and zinc salts, have limitations in terms of efficacy, adverse effect profiles, and complex dosing regimens that impair long-term patient compliance. These shortcomings often lead to treatment discontinuation and suboptimal disease control.

metaLead Therapeutics AG (metaLead) is developing a next-generation copper chelating agent based on a proprietary class of metal-binding short peptides. Our candidates were selected through a structure-driven platform that optimizes for high copper affinity, selectivity over essential metal ions, metabolic stability, biochemical inertness, and favorable pharmacokinetics. In contrast to current therapies, our candidates are designed to achieve effective copper clearance with improved tolerability and a simplified administration route, supporting better adherence.

In this talk, the design principles that led to the development of the scaffold will be discussed. Furthermore, the discovery process and screening will be shared, including physicochemical and biochemical characterization, preclinical efficacy, and non-GLP safety studies. Our data suggest that metaLead's peptides have the potential to redefine the therapeutic standard in WD by offering a safer, more effective, and patient-centric treatment option.