WilsonMed: Multimolecular targeting of copper overload in Wilson disease

Abstract: Wilson disease (WD) results from a defect of copper (Cu) transporter ATP7B leading to high oxidative stress due to Cu accumulation, mostly in the liver. Currently, therapy is based on anti-Cu compounds identified decades ago. However, a portion of WD patients do not respond, show non-compliance, and miss adequate therapy in case of high emergency, including liver transplantation. WilsonMed is a unique partnership that unites leading experts of basic/translational research, clinicians, and PAOs to (i) provide novel treatment options, (ii) launch proof-of principle studies in preclinical models, (iii) assess predictive biomarkers for monitoring of therapy, and (iv) disseminate novel concepts first-hand to PAOs. The partners of WilsonMed are stemming from distinctive fields having long-lasting expertise of state-of-the-art research, including (i) novel chemically-tailored Cu chelators having improved efficacy, (ii) screening of anti-Cu moieties, including repurposed drugs (iii) compound-induced enhancement of tissue-specific autophagy, (iv) gene-editing/silencing methodology, and (v) establishment of novel WD models. Having achieved important milestones in their individual fields, the partners combine activities by sharing advanced cellular platforms, animal models, and multi-molecular concepts for the short-term implementation of innovative treatment strategies. The expertise of the WilsonMed partners and PAOs will be synergistically combined to contribute to a significant enhancement in the management and therapy of patients having WD.