Proteomic approaches to uncover MMP function

Proteomics has revolutionized protease research and particularly contributed to the identification of novel substrates and their sites of cleavage as key determinants of protease function. New technologies and rapid advancements in development of powerful mass spectrometers allowed unprecedented insights into activities of matrix metalloproteinases (MMPs) within their complex extracellular environments. Mass spectrometry-based proteomics extended our knowledge on MMP cleavage specificities and will help to develop more specific inhibitors as new therapeutics. Quantitative proteomics and N-terminal enrichment strategies have revealed numerous novel MMP substrates and shed light on their modes of action in vitro and in vivo. In this review, we provide an overview of current proteomic technologies in protease research and their application to the functional characterization of MMPs.