第556回　薬学研究科セミナー

Péter Nagy 教授　講演会

Department of Molecular Immunology and Toxicology
National Institute of Oncology, Budapest, Hungary

Control of Protein Function Through Oxidation and Reduction of Persulfidated States

日時: 令和元年7月9日(火)　10:00-11:30
場所: 東北大学大学院薬学研究科　大講義室

Nagy教授はハンガリー国立がん研究所のScientific Directorを務められており、サバティカルで本学にご滞在中です。Nagy教授はレドックス生物学、特に生体中の硫黄種の研究に顕著な業績を上げられており、本講演でも最新の知見等をご紹介いただけるとのことです。今回、本学との国際共同研究プロジェクトの開始に伴い、ご講演頂けることとなりましたので、皆様の御来聴をお待ちしております。

講演要旨

In the field of Redox Biology, protein cysteine persulfidation (P-Cys-SSH) and polysulfidation (P-Cys-SS_xH) is gaining increasing attention as an important regulatory element of protein functions. Initially it was proposed to be mainly the result of hydrogen sulfide's biological actions, but recently the Akaike laboratory demonstrated that these modifications can be produced enzymatically via pathways that does not require H_2S.

We demonstrated that protein Cys per/polysulfidation is highly regulated via the NADPH-dependent reducing machineries, the thioredoxin and glutathione systems.
We have shown that persulfidation has a regulatory role on a number of protein functions and recently we also obtained evidence that these modifications have important protein protecting functions in cells and *in vivo*. In cellular systems a substantial fraction of important thiol proteins (such as peroxiredoxins, PTP1B, PTEN, KEAP1 or Hsp90) are present in their persulfidated state, which we propose is a preemptive mechanism to prevent them from overoxidation during oxidative stress. We demonstrated that protection is due to formation of perthio sulfenic, sulfinic and sulfonic acid derivatives (Cys-$SSO_{1\text{-}3}H$), which can be reduced back by the thioredoxin system to the corresponding native thiol forms when the stress is over.

Financial support from the National Research, Development and Innovation Office (grants No.: KH17_126766 and K 109843) and the Thematic Excellence Program 2019 are greatly acknowledged.

連絡先:　斎藤 芳郎 (薬学研究科代謝制御薬学分野)
yoshiro.saito.a8@tohoku.ac.jp　022-795-6870