

**Title: Persulfidation of cysteine residues govern protein function and provide protection during oxidative stress****Speaker: Prof. Péter Nagy**

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Date: Wednesday, September 4, 2019, 16:00-17:30

Place: Health and Medical Science Innovation Building 105

**Abstract:**

In the field of Redox Biology, protein cysteine persulfidation (P-Cys-SSH) and polysulfidation (P-Cys-SSxH) is gaining increasing attention as an important regulatory element of protein functions. 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<sub>1-3</sub>H), which can be reduced back by the thioredoxin system to the corresponding functional native thiol forms when the stress is over.

**【References】**

- 1) Virág Bogdándi et. al. Speciation of Reactive Sulfur Species and their Reactions with Alkylating Agents: Do we have any clue about what is present inside the cell? **British Journal of Pharmacology** (2019) 176, 646-670.
- 2) Éva Dóka et. al. Novel persulfide detection method reveals protein persulfide and polysulfide reducing functions of thioredoxin- and glutathione-systems. **Science Advances** (2016) 2(1):e1500968.
- 3) Romy Greiner et. al. Polysulfides link H<sub>2</sub>S to protein thiol oxidation. **Antioxidants and Redox Signaling** (2013) 19(15), 1749-1765.

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