Graduate Schools
Infection Immunity and Cancer, UniGe & UniL: CUS
Biology & Medicine, CMU

Seminar in Microbiology

Monday, 17th October, 2016

Salle de séminaire, E07.3347.a, CMU

11:30 – 12:30

Prof. Frédéric Barras

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Fighting oxidative stress by repairing damaged proteins : the role of Methionine sulfoxide reductases.

Methionine ranks among the amino acid the most sensitive to reactive oxygen species (ROS), which convert them into methionine sulfoxide (Met-O). The vast majority of proteins containing Met-O residues loose function, get degraded and/or form aggregates. To combat such dreadfull consequences, all living organisms synthesize enzymes, methionine sulfoxide reductases (Msr), that reduce Met-O back to Met, thereby acting as true protein repair devices. In a first part I will provide basic molecular, biochemical and evolutive information on ubiquitous Msr, and highlight their physiological importance by describing processes under Msr surveillance. In a second part, I will present our recent discovery of a new type of Msr, using a unique way of reducing Met-O residues and involved in protein repair in the bacterial cell envelope. Importance for cell envelope integrity and pathogenicity will be discussed.

Selected recent publications:

- A Regulatory Circuit Composed of a Transcription Factor, IscR, and a Regulatory RNA, RyhB, Controls Fe-S Cluster **mBio**. 2016.
- Repairing oxidized proteins in the bacterial envelope using respiratory chain electrons. **Nature** 2016
- Turning Escherichia coli into a Frataxin-Dependent Organism **PLoS Genet**. 2015
- ubiJ, a New Gene Required for Aerobic Growth and Proliferation in Macrophage, Is Involved in Coenzyme Q Biosynthesis in Escherichia coli and Salmonella enterica Serovar Typhimurium **J Bacteriol**. 2014
- Fe-S cluster biosynthesis controls uptake of aminoglycosides in a ROS-less death pathway. **Science**. 2013

P.VIOLLIER & P. LINDER