

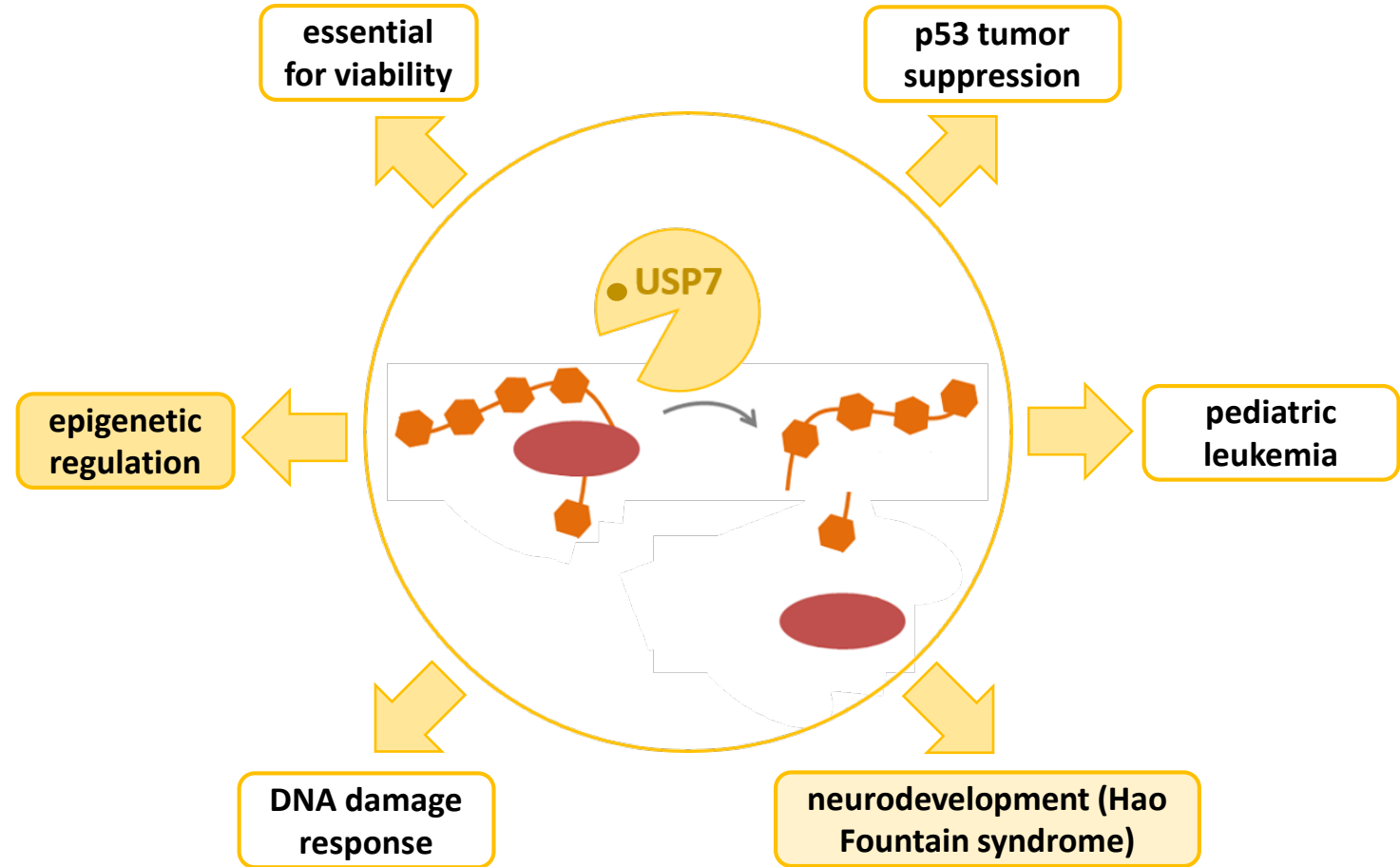
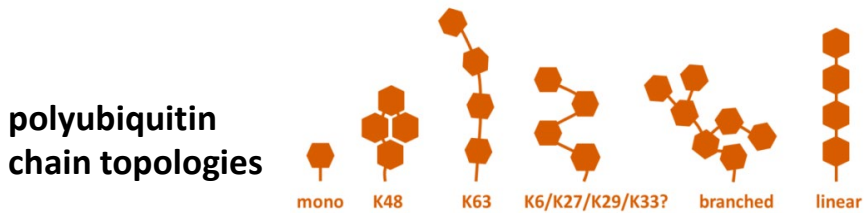
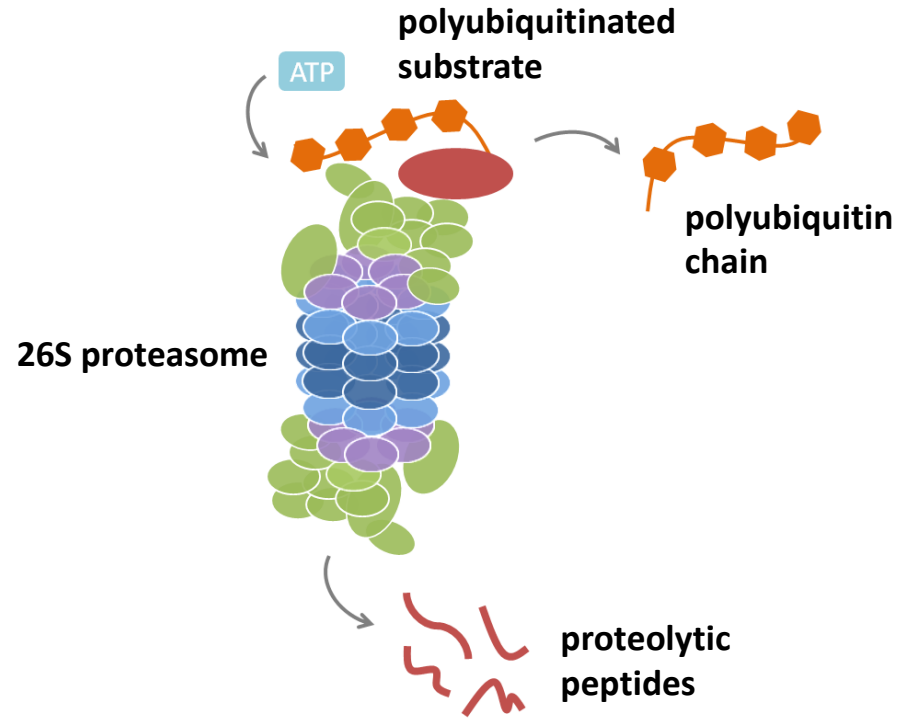
Targeted mass spectrometry reveals that USP7 regulates the ncPRC1 Polycomb axis

Pre-ASMS Skyline user meeting | June 4, 2023 | Houston, TX

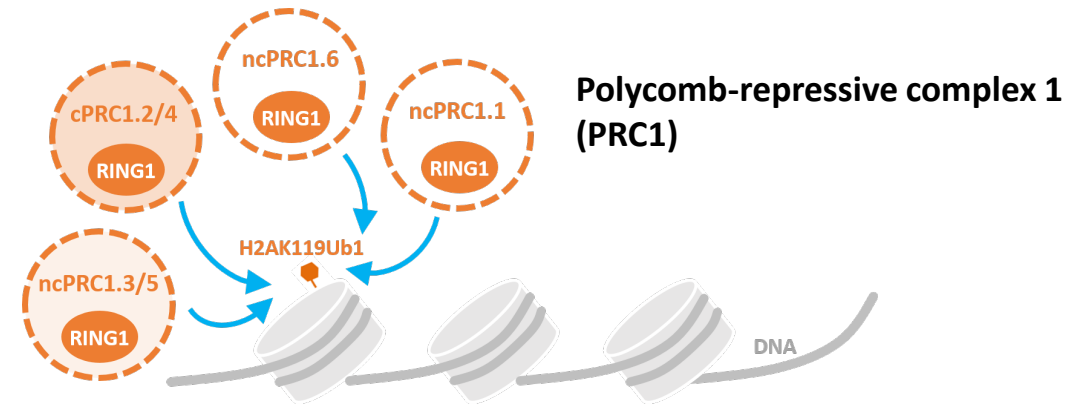
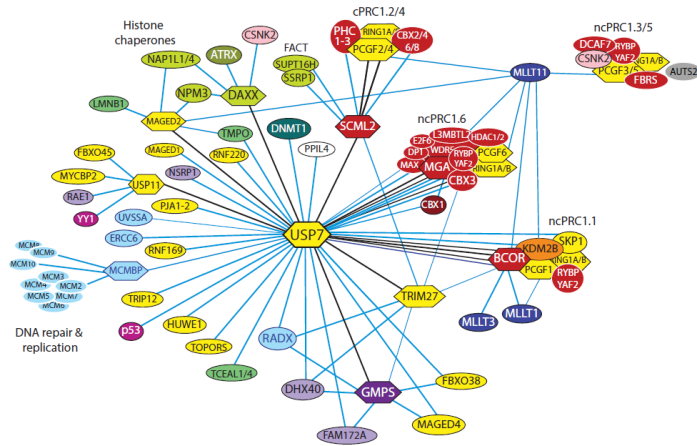
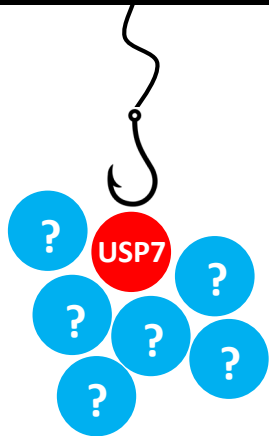
Jeroen Demmers
Erasmus University Medical Center
Rotterdam, the Netherlands



Ubiquitin Specific Protease 7 (USP7)

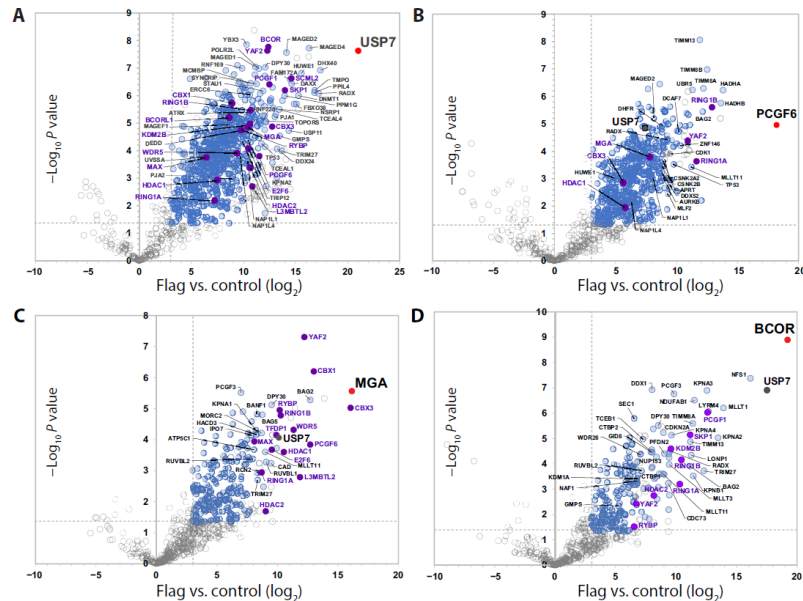


USP7 interactome



Depletion of USP7 -> what is the effect on its interaction partners and targets?

Targeted detection of interactors and targets (PRM)

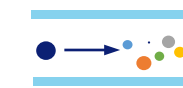


1st quadrupole

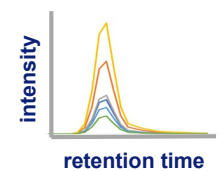
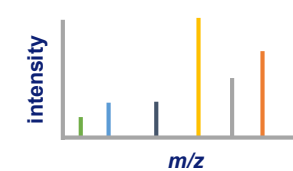


peptide

2nd quadrupole

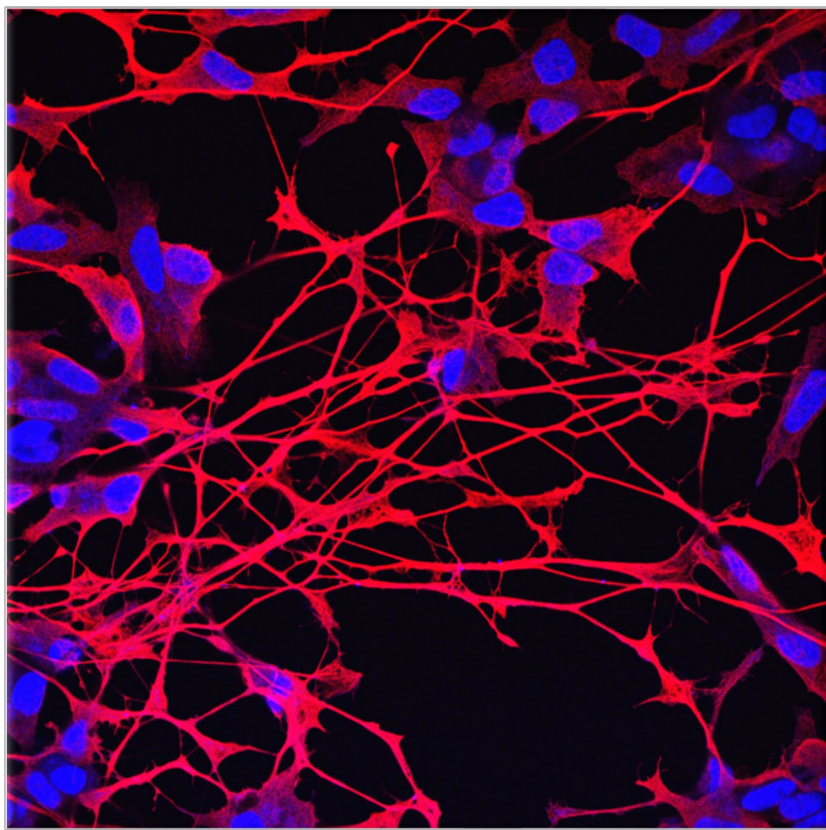


orbitrap

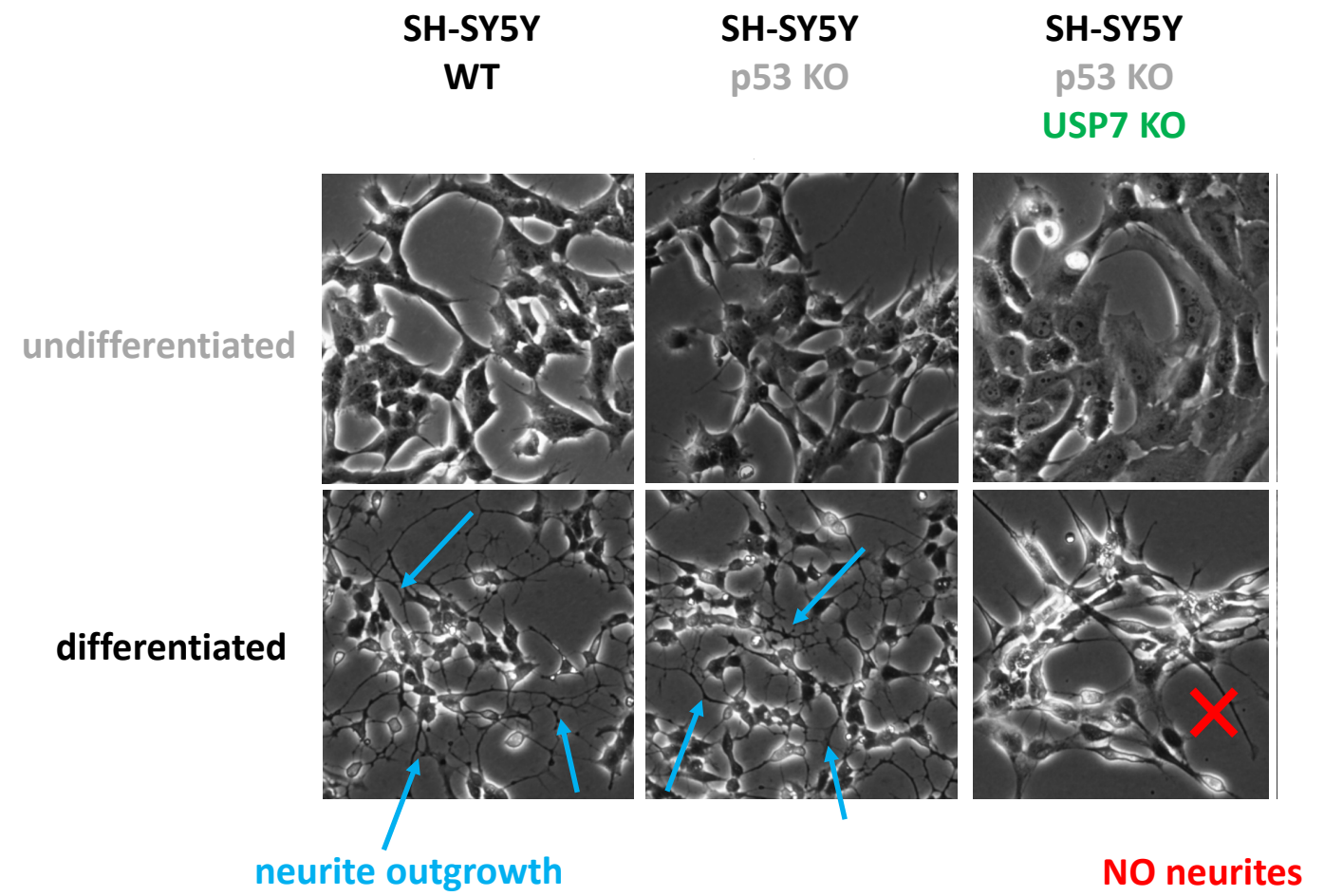


USP7 is involved in neurodevelopment

differentiated SH-SY5Y cells
(neuroblastoma cell line)



Blue: DAPI
Red: β -tubulin III (neuronal marker)

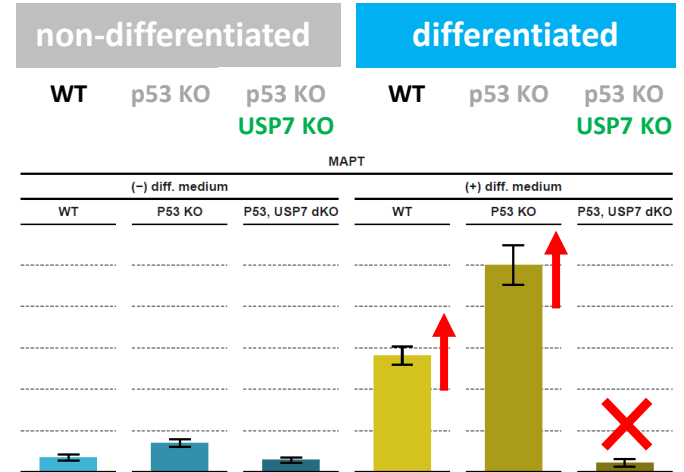
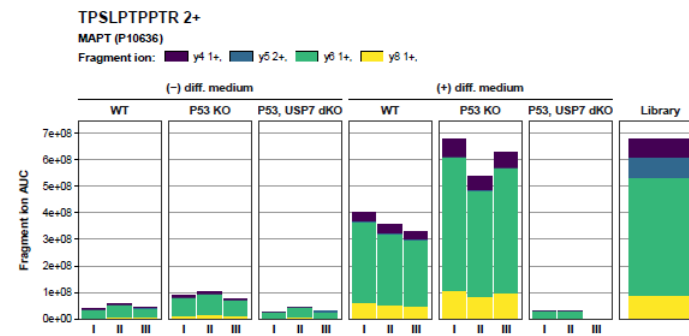
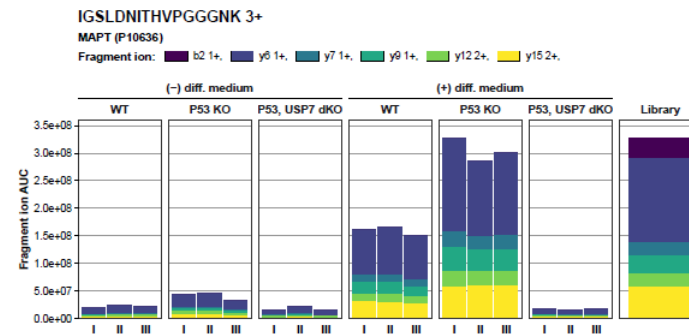
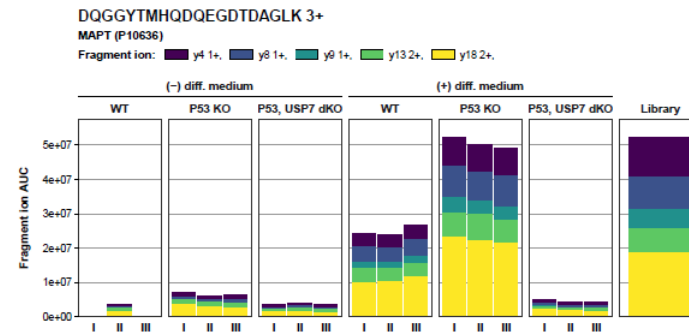
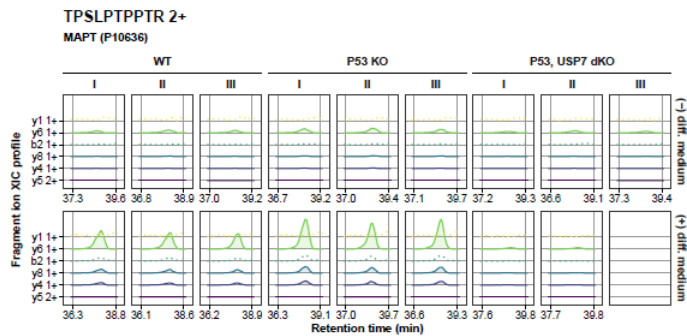
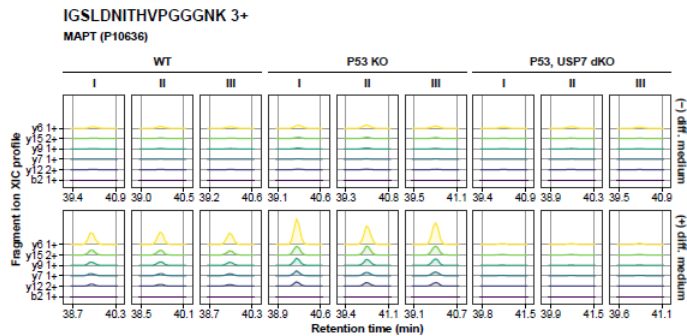
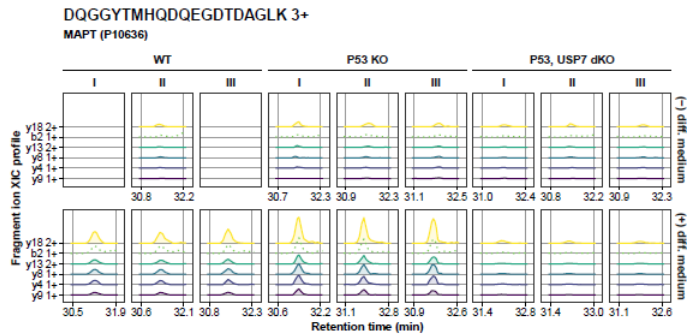


USP7 dependent expression of microtubule associated protein tau (MAPT)

fragment ion level

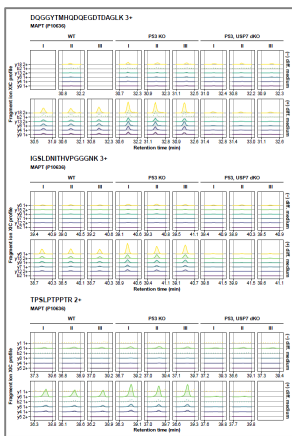
peptide level

protein level

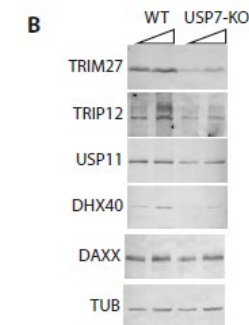
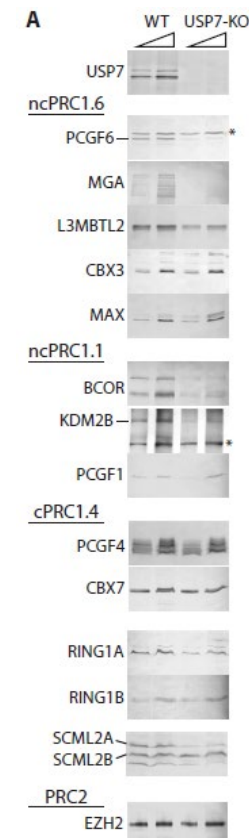
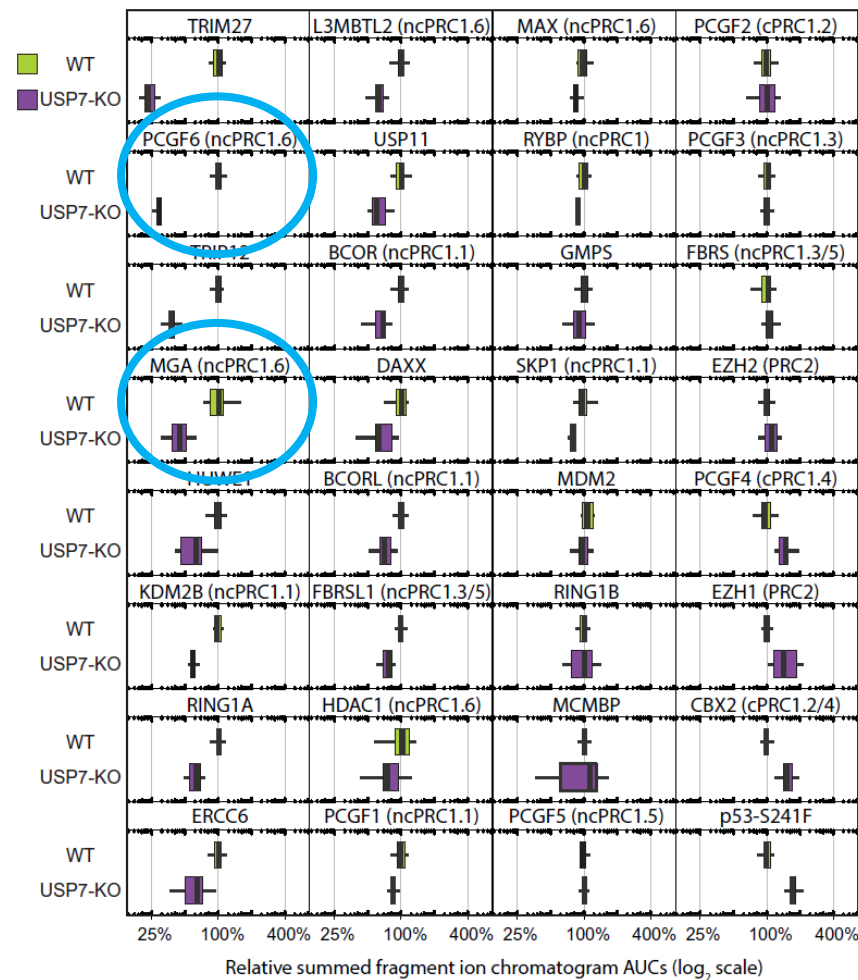
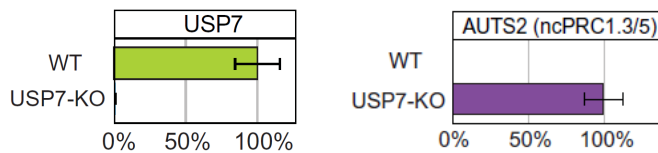
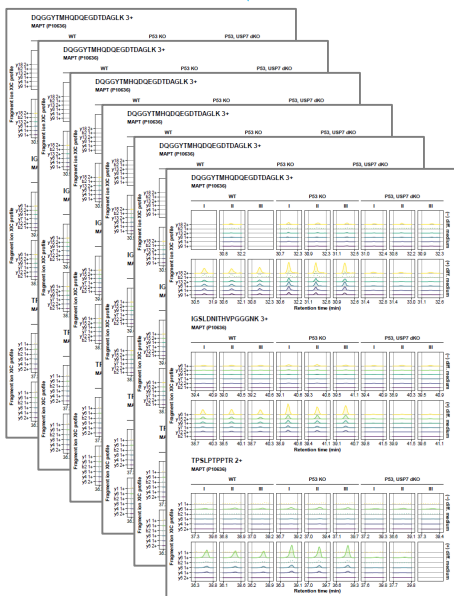


Other USP7 interactors and targets (WT vs KO)

peptide target

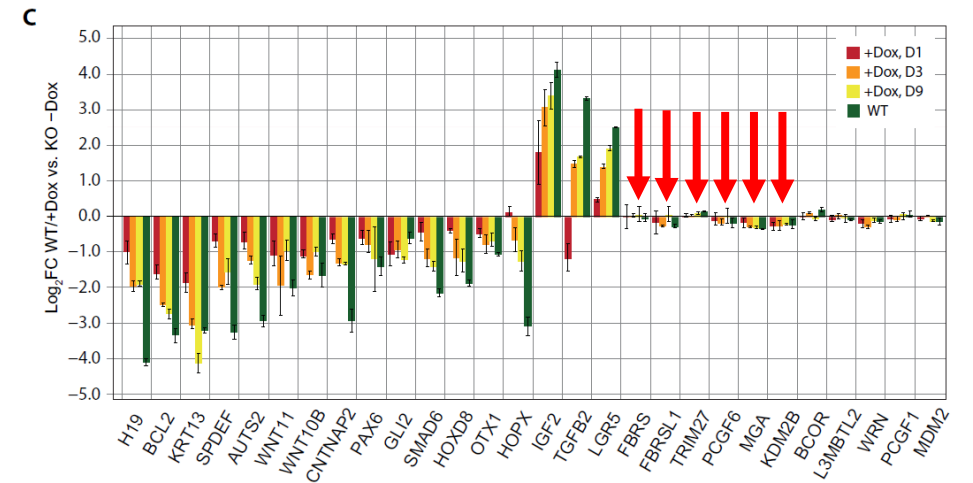
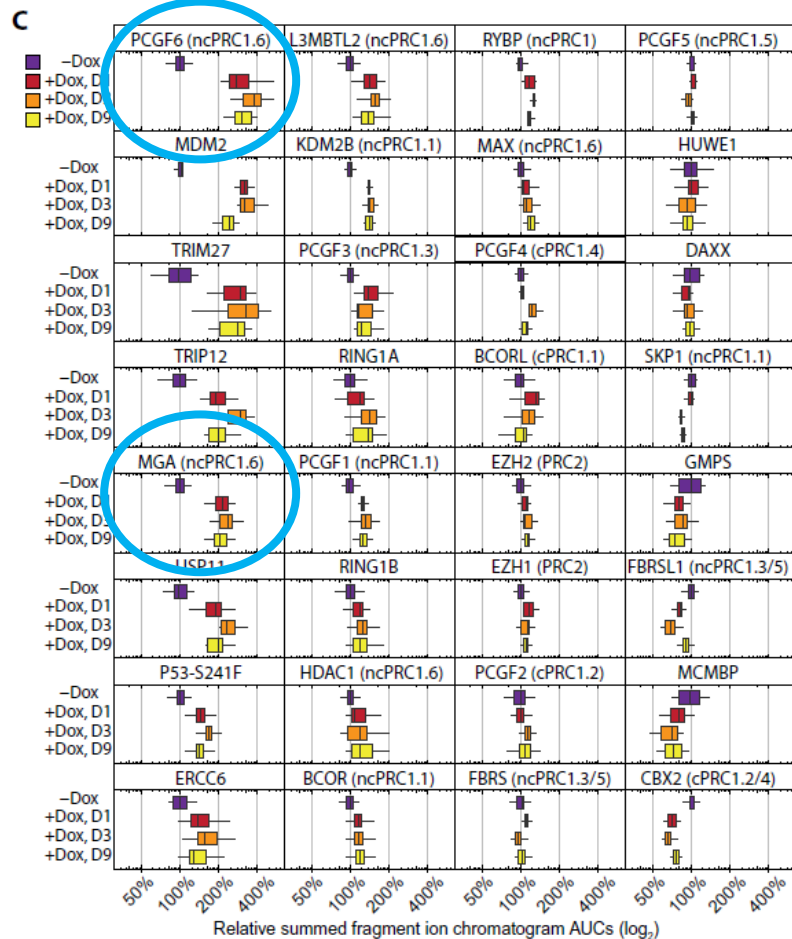
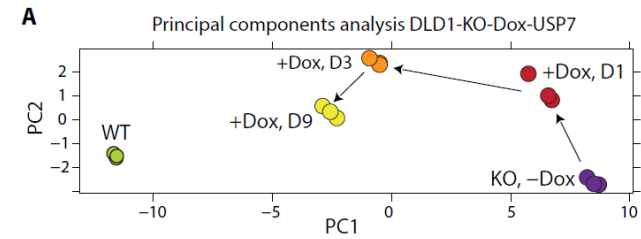
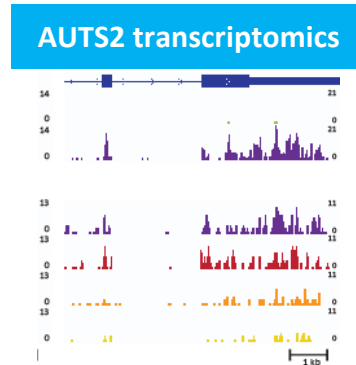
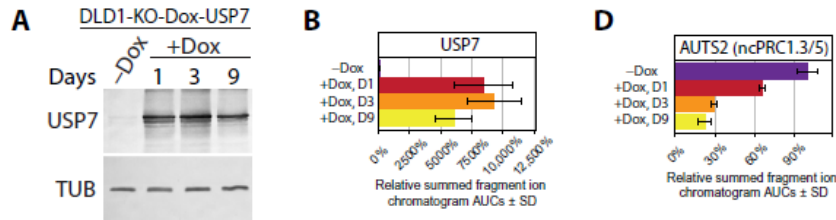


~150 x



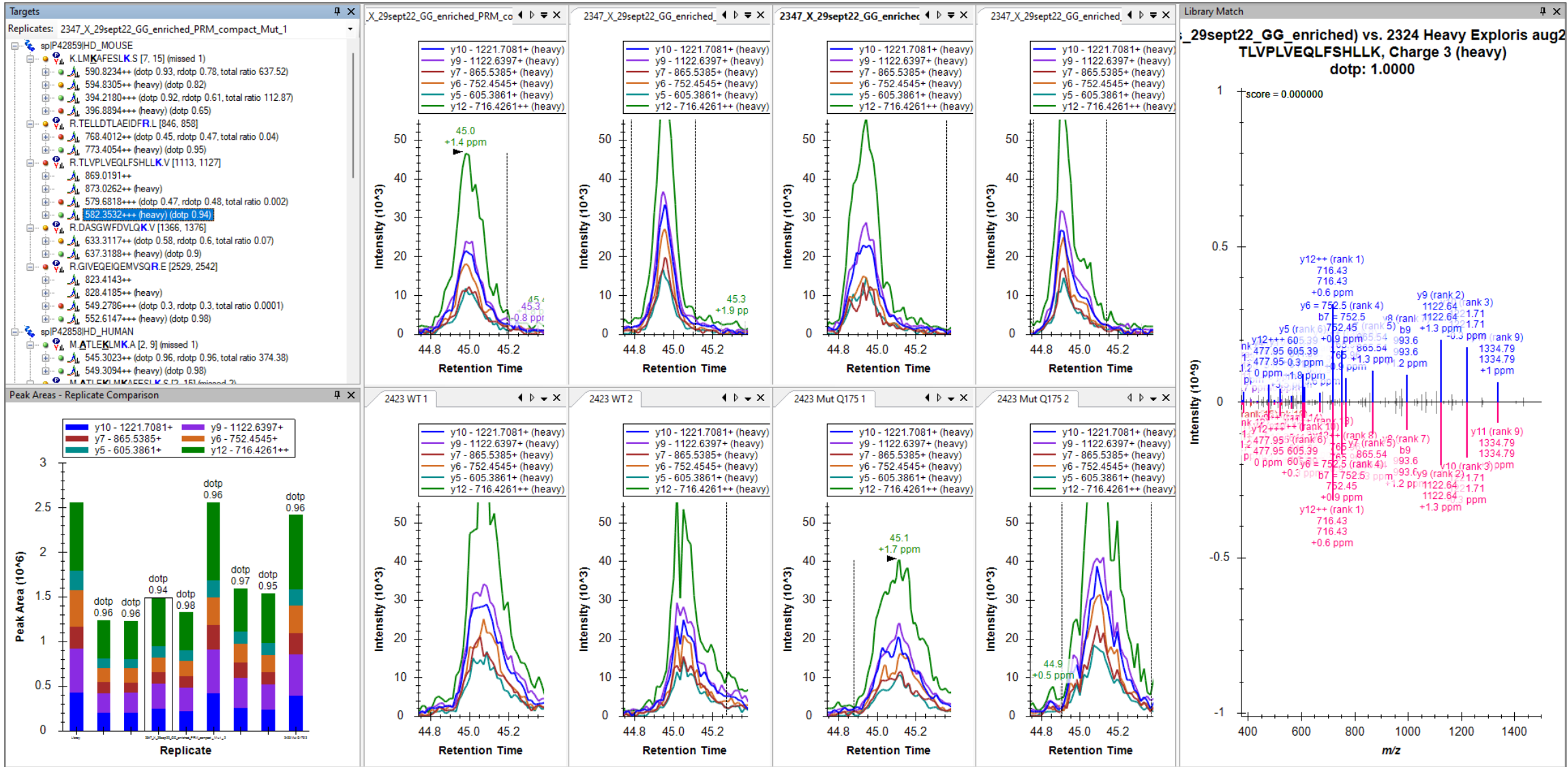
Dox induced re-expression of USP7: mRNA and protein level

■ -Dox
■ +Dox, D1
■ +Dox, D3
■ +Dox, D9

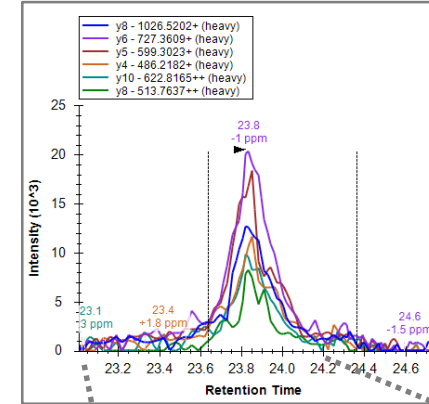
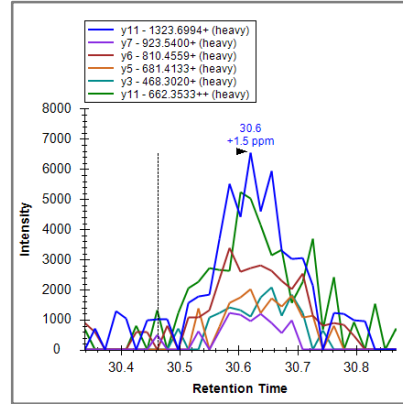
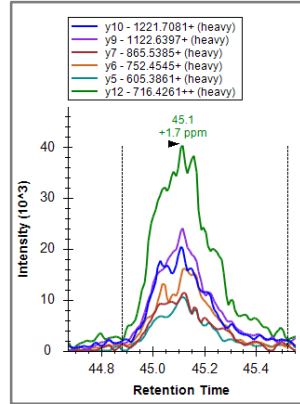
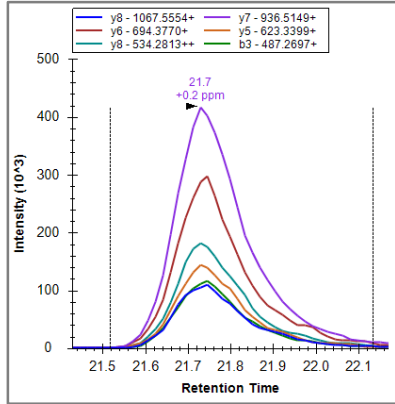


Protein abundance regulation at the **mRNA expression level**
 AND at the **protein degradation** (posttranslational) level.

What RAW PRM data look like...



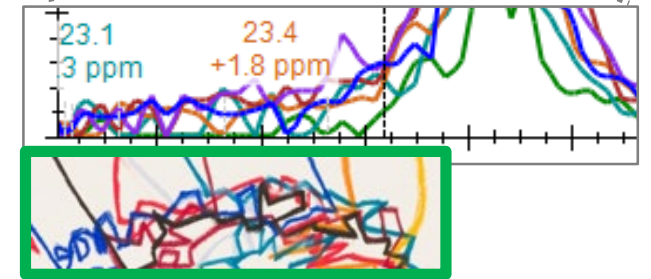
Which reminds me of...



Monet Museum, Paris



Painting by Gerard Fromanger



Acknowledgements

Erasmus University Medical Center, Rotterdam
Proteomics Center

Karel Bezstarosti
Wouter Doff
Karen Sap
Lennart van der Wal
Karen Sap
Dick Dekkers
Nadine Prust
Jantine Tieleman

Erasmus University Medical Center, Rotterdam
Department of Biochemistry

Ayestha Sijm
Joyce Wolf - van der Meer
Gill Chalkley
Jan van der Knaap
Peter Verrijzer

- Sijm, *et al.*, Science Advances 8, eabq7598 (2022) | DOI:10.1126/sciadv.abq7598
- Wolf – van der Meer, *et al.*, unpublished data.

€€



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