## **Description of Additional Supplementary Files**

File Name: Supplementary Data 1

Description: Mass spectrometry analysis of MORF and MOZ complexes purified by tandem affinity chromatography presented in Fig. 1c. Spectral counts for each indicated protein are presented.

File Name: Supplementary Data 2

Description: Primers used for ChIP qPCR.

File Name: Supplementary Data 3

Description: Relative abundance of single PTMs for each analyzed cell line and the average of the four. The relative abundance of the single marks was obtained by summing the relative abundance of all the quantified peptides carrying a given PTM.

File Name: Supplementary Data 4

Description: Relative abundance of binary PTMs for each analyzed cell line and the average of the four. The relative abundance of the binary marks was calculated as for the single marks, but in this case, they were summed the relative abundances of all the peptides that contained both marks.