Description of Additional Supplementary Files

File Name: Supplementary Data 1 Description: SENP3 and SENP5 interactomes

File Name: Supplementary Data 2 Description: Candidate SENP3-controlled SUMO targets

File Name: Supplementary Data 3 Description: Proteome for SENP3 targets

File Name: Supplementary Data 4 Description: Candidate SENP5-controlled SUMO targets

File Name: Supplementary Data 5 Description: Proteome for SENP5 targets

File Name: Supplementary Data 6 Description: UTP14A interactome

File Name: Supplementary Data 7 Description: Proteome for UTP14A interactome

File Name: Supplementary Data 8 Description: Proteome of siSENP3 in U2OS

File Name: Supplementary Data 9 Description: : RNA-Seq of siSENP3 in U2OS

File Name: Supplementary Data 10 Description: Proteome of siSENP3 in Saos-2

File Name: Supplementary Data 11 **Description:** RNA-Seq of siSENP3 in Saos-2

File Name: Supplementary Data 12 **Description:** List of used plasmids

File Name: Supplementary Data 13 **Description:** List of used siRNAs

File Name: Supplementary Data 14 Description: List of used antibodies