**Supplementary Figure Legends**

**Supplementary Figure S1.** Effect of JMJD3 on nuclear architecture. Arrows mark

nuclear envelope blebs in each of the U251.JMJD3wt images . **(A1)** High-magnification

images of (control) U251.vector, U251.JMJD3mut and U251.JMJD3wt cells

immunostained for lamin A/C and counterstained with DAPI (scale bars = 10 μm). **(A2)**

Percentages of nuclei classified as “round”, “smooth/ovoid” or “blebbed” based on DAPI

fluorescence according to the exemplar samples shown in **A1** (*n* = 206 for U251.vector,

243 for U251.JMJD3mut, and 133 for U251.JMJD3wt). **(B)** Transmission electron

micrographs of U251 cells transfected with the constructs indicated (scale bars = 2 μm).

**(C)** Reconstruction of U251 cells transfected with the constructs indicated and stained

with phalloidin-Alexa 488 (green) and DAPI (blue). Z-stack confocal microscope images

were processed using AMIRA software. Note the ruffled texture of the nucleus and

nuclear blebbing in the U251.JMJD3wt image (scale bar = 10 μm).

**Supplementary Figure S2. (A)** U251.JMJD3wt cells lack γH2AX foci. U251.JMJD3wt

cells immunostained for γH2AX foci (red) and counterstained with DAPI (blue). As a

positive control for γH2AX foci formation, U251.JMJD3wt cells were irradiated (Cs137

source) with 10 Gy γ-radiation and examined after 24 hr. Note the absence of γH2AX

foci in untreated U251.JMJD3wt cells. Scale bar = 10 μm. **(B)** Western blot for γH2AX in

U251.JMJD3 cells showing the relative deficit of γH2AX in non-irradiated cells.