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Supporting Information for:

Functional MoS_2 nanosheets inhibit melanogenesis to enhance UVB/X-ray induced damage

Ling Jiang[a, #], Yanyan Xu[b, #], Pei Zhang[b], Yi Zhang[c, d], Huimin Li[b], Jing Chen[a, *], Song Liu[b, *], Qinghai Zeng[a, *]

a Department of Dermatology, Third Xiangya Hospital, Central South University, Changsha, 410013, China

b Institute of Chemical Biology and Nanomedicine (ICBN), State Key Laboratory of Chemo/Biosensing and Chemometrics, College of Biology, College of Chemistry and Chemical Engineering, Hunan University, Changsha, 410082, China

c Hunan Key Lab of Mineral Materials and Application, Central South University, Changsha 410083, China

d School of Minerals Processing and Bioengineering, Central South University, Changsha 410083, China

[#] These authors contributed equally to the work

*corresponding authors: 271594943@qq.com, 43700351@qq.com, liusong@hnu.edu.cn

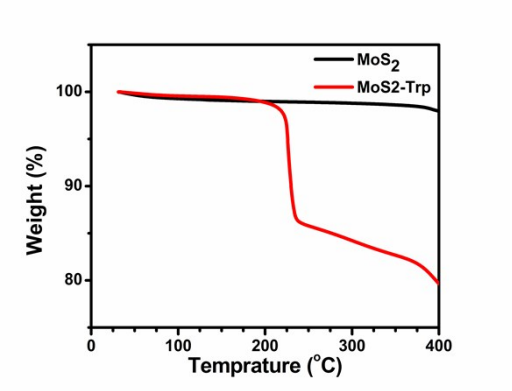

Fig. S1. Thermogravimetric analysis (TGA) curve of MoS_2-Trp nanosheets. The weight loss of 3% is due to water below 100 °C. The weight loss of ~22 % is mainly attributed to the thermal decomposition of Trp into carbon in the range of 200-400 °C.

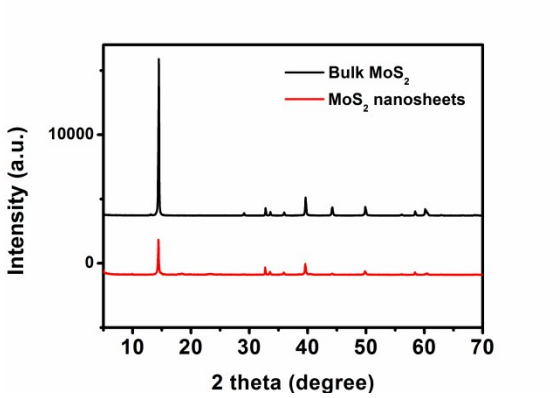

Fig. S2. XRD patterns of powders of bulk MoS_2 (black) and exfoliated MoS_2-Trp nanosheets (red). It shows that the nanosheets remain the crystalline nature after exfoliation.

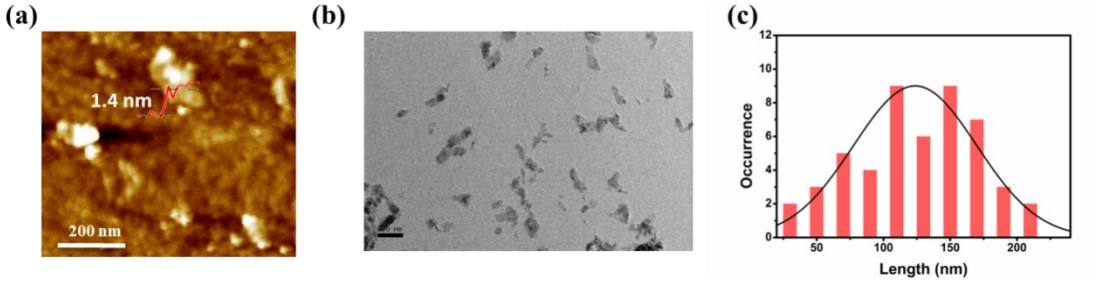

Fig. S3. (a) AFM image of few-layers MoS_2-Trp with the thickness of 1.4 nm-4 nm. TEM image of MoS_2-Trp in figure (b) and (c) the dimensional chart of MoS_2-Trp from TEM image. These results indicate the size distribution of MoS_2 -Trp from the 50 samples was ranged from 31.757 nm to 210.888 nm. And the mean diameter of MoS_2-Trp is 124.89 nm which is consistent with 123.4 nm from AFM test. Compared with the date from DLS, the deviation may be due to the uneven size of the material.

Fig. S4 Add 0.5 mL MoS_2-Trp-PEG to 1.5mL serum and it still evenly dispersed after 2 days.

Table S1. The sequences of all primers used in this study

Target gene	Forward primer (5′-3′)	Reverse primer (5′ –3′)
MITF	AATGGCAAATACGTTACCCG	AAGGTTGGCTGGACAGGAGT
TYR	AGCCCAGCATCCTTCTTCTC	AGTGGTCCCTCAGGTGTTCC
DCT	AAATAATGAGAAACTGCCAACC	CGTCTGCTTTATCAAACCCT
RAB27a	ACGCTATGGGTTTCCTGCTT	CCTCTTTCACTGCCCTCTGG
FSCN1	ATTGGCTGCCGCAAGGTCAC	CCCGTGGAGTCTTTGATGTTGT
MYO5A	AATCTCCGAGTTCGCTTCAT	ATCCCTTGCCATTTGCTTGT

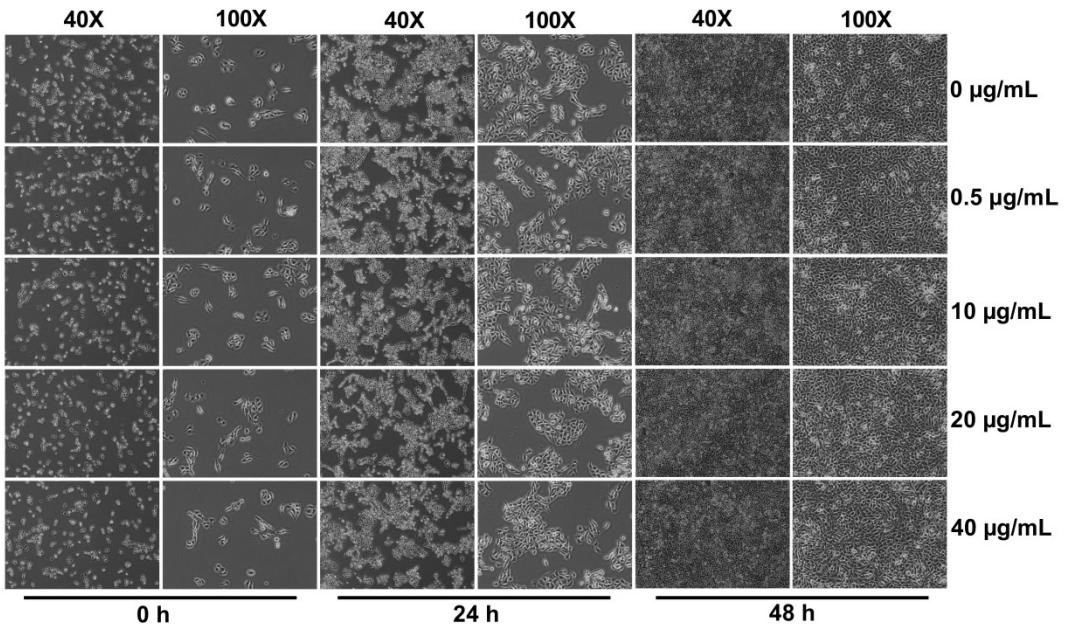

Fig. S5. Morphological changes in B16F10 cells induced by MoS_2-Trp-PEG, which was seen via inverted microscopy. Magnification 40× and 100×.

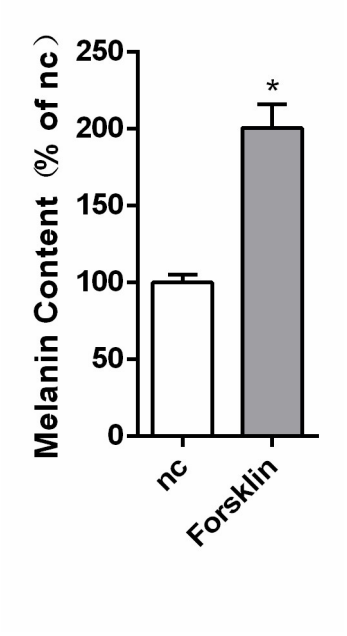

Fig. S6. Melanin content of Forsklin stimulated B16F10 cells were expressed as percentages relative to nc group (*$P < 0.05$). nc: normal cells.

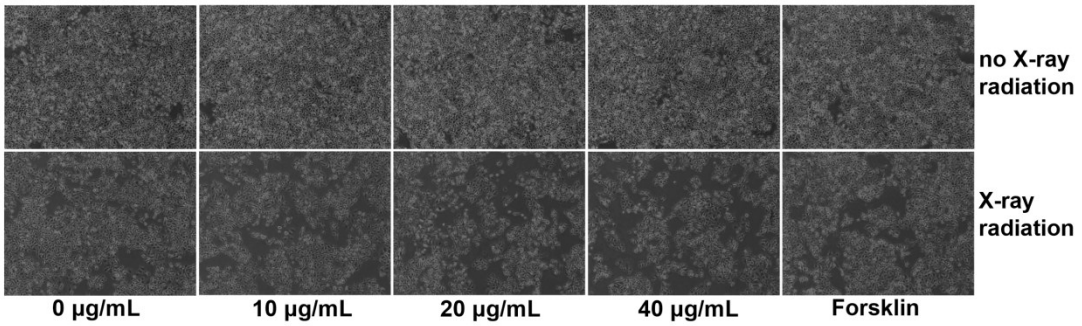

Fig. S7. MoS_2-Trp-PEG increases X-ray-induced cells damage. Cell numbers changes in B16F10 cells induced by MoS_2-Trp-PEG alone or combined with X-ray were seen by inverted microscopy. Magnification 40×.