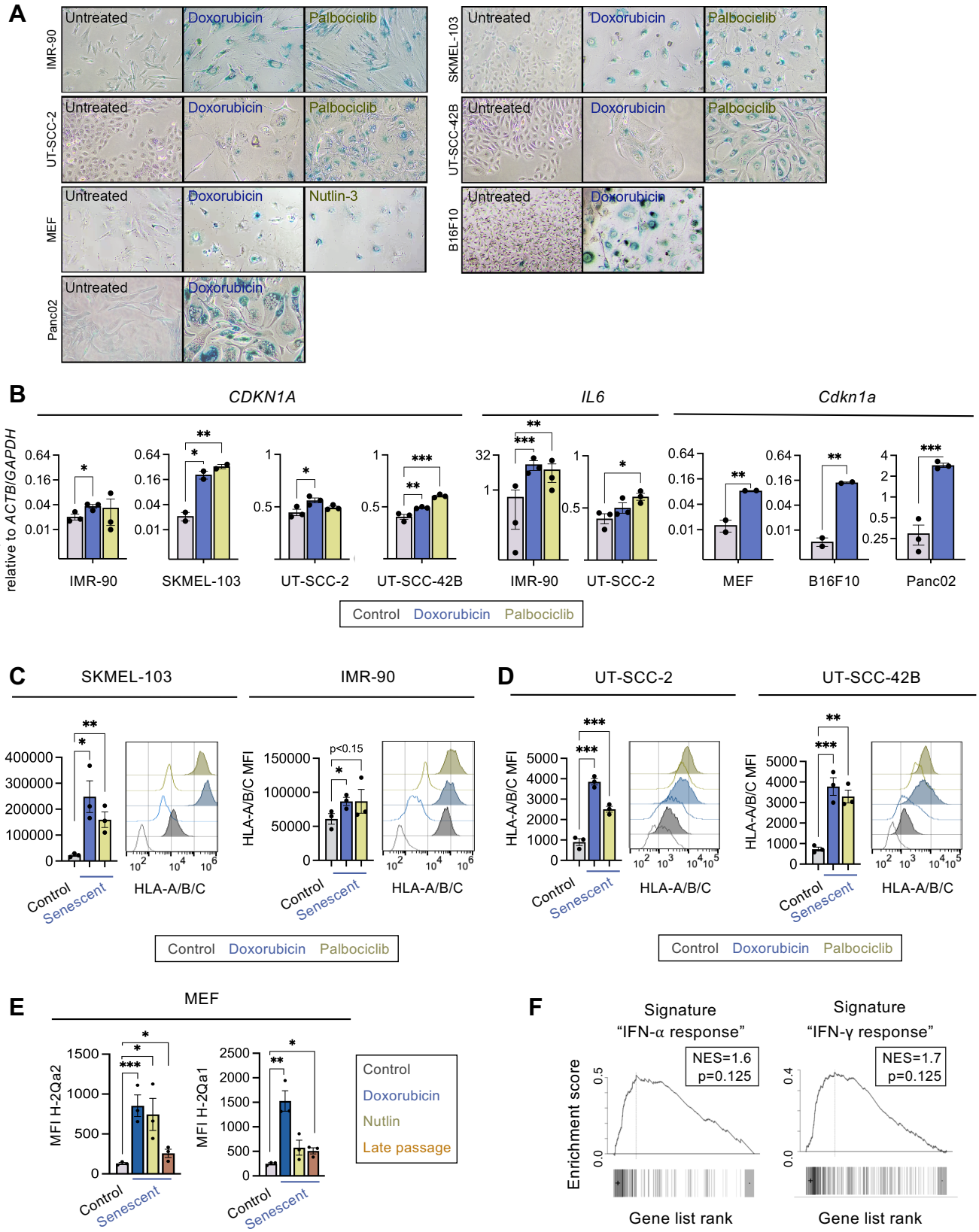
Supplementary Figure S1: Senescent cells upregulate MHC class I antigen presentation



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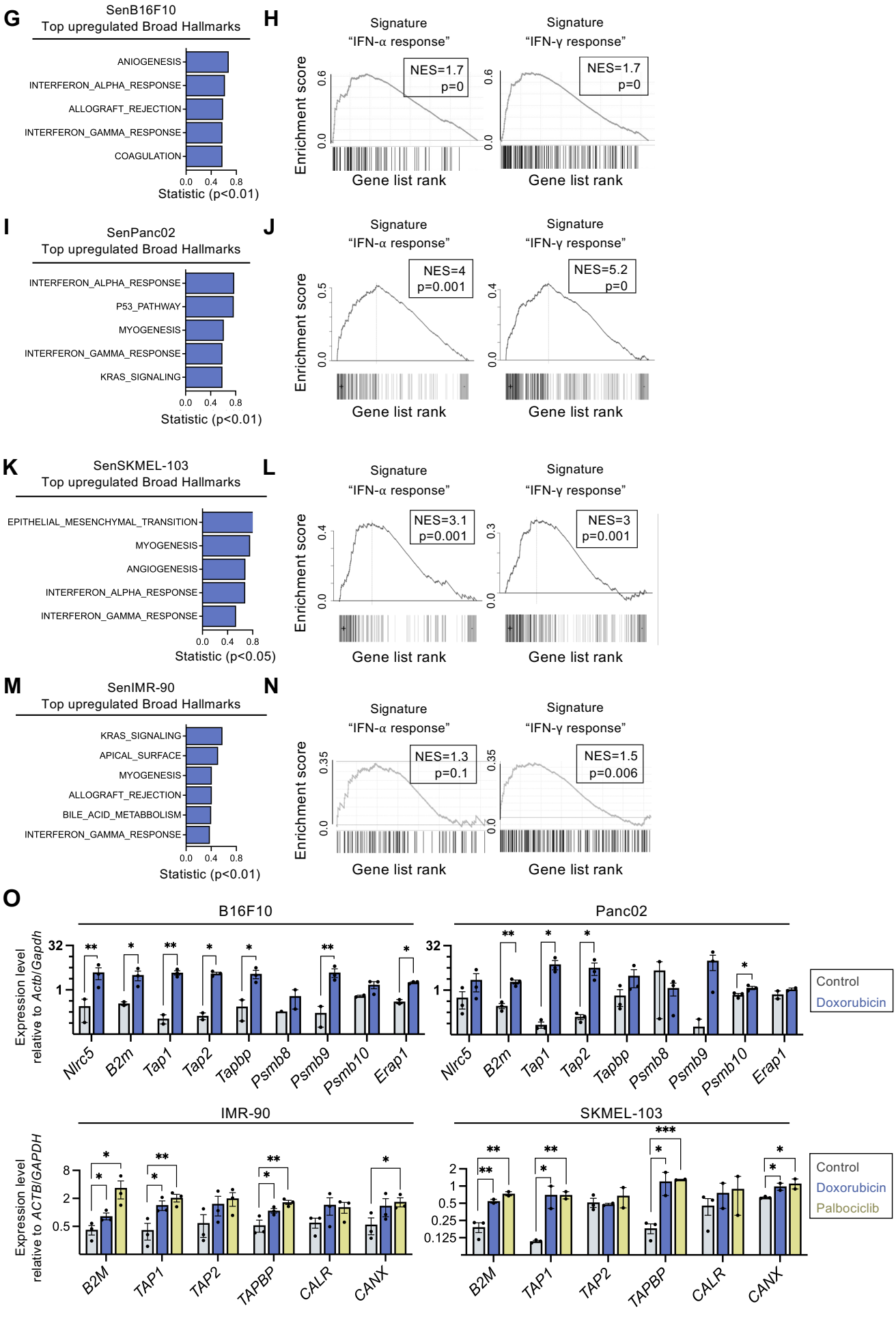

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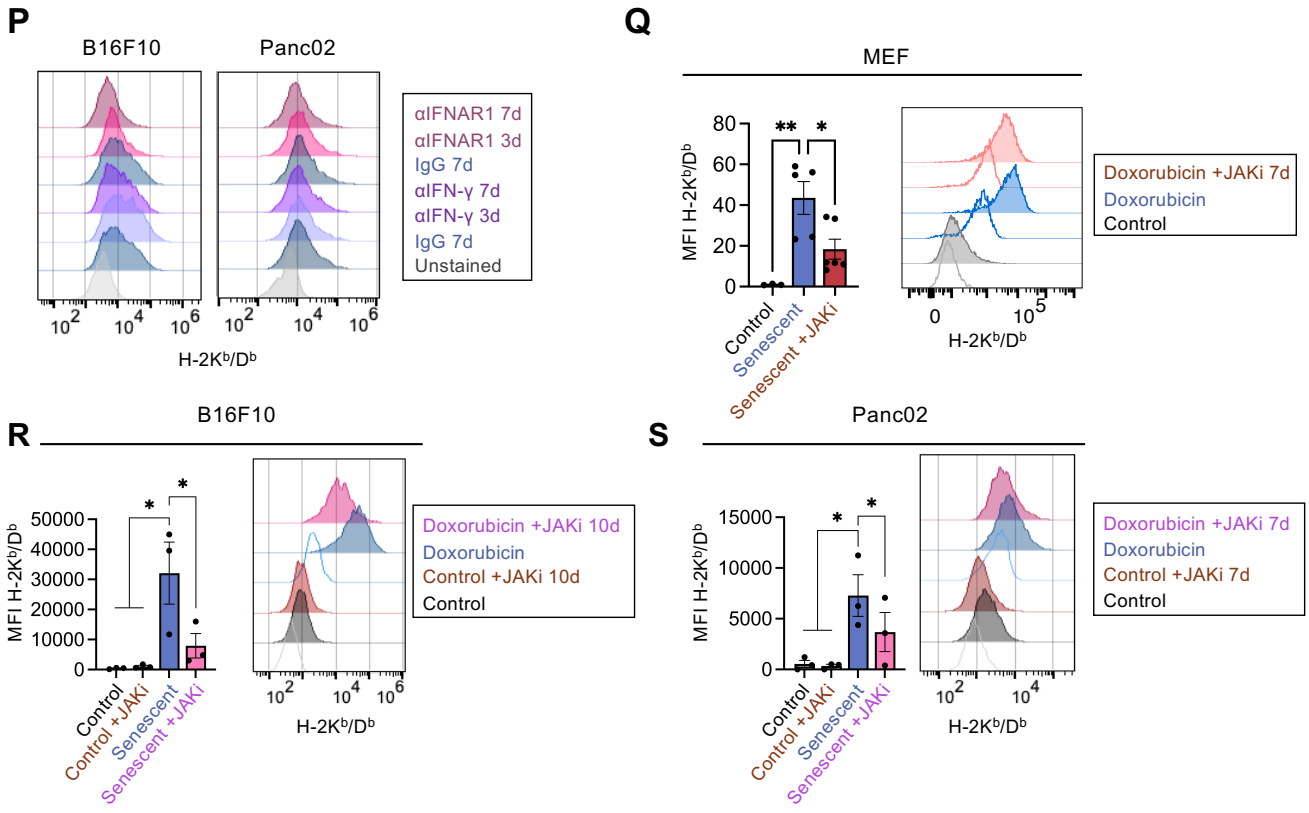

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A. Senescence-associated beta-galactosidase staining of human (SKMEL-103, IMR-90, UT-SCC-2 and UT-SCC-42B) and murine (B16F10, MEF, Panc02) cells, control or exposed to the indicated senescence-inducing stimuli.

B. mRNA expression levels of *CDKN1A* in human (SKMEL-103, IMR-90, UT-SCC-2 and UT-SCC-42B), *IL6* (IMR-90 and UT-SCC-2) and *Cdkn2a* in murine (B16F10, MEF, Panc02) cells, control or exposed to the indicated senescence-inducing stimuli of *n*=2-3 independent experiments. *p<0.05, **p<0.01; unpaired Student's t test, compared to control cells.

C. Flow cytometry analysis of HLA-A/B/C expression in control or senescent IMR-90 and SKMEL-103, treated with doxorubicin or palbociclib. Histogram showing the fluorescence signal of each stained sample and its unstained control (uncolored histogram).

D. Flow cytometry analysis of HLA-A/B/C expression in control or senescent UT-SCC-2 and UT-SCC-42B cancer cells, treated with doxorubicin or palbociclib. Representative histograms showing the fluorescence signal of each stained sample and its unstained control (uncolored histogram) and quantification after autofluorescence of *n*=3 independent experiments are shown. ***p<0.001, *p<0.05; two-way ANOVA test, compared to control cells.

E. Flow cytometry analysis of H-2Qa1 and H-2Qa2 expression in control *versus* senescent MEFs, in which senescence was induced by doxorubicin, nutlin or by late passaging. Quantification after autofluorescence subtraction of *n*=3 independent experiments are shown. ***p< 0.001, **p<0.01, *p<0.05; unpaired Student's t test, compared to Control MEFs.

F. Gene set enrichment analysis (GSEA) of the signatures "IFN-α response" and "IFN-γ response" (Broad Hallmarks), found upregulated in the RNAseq analysis of senescent compared to control MEFs.

G. Top 5 upregulated Broad Hallmarks from the differential expression analysis (RNAseq) of senescent B16F10, in which senescence was induced by doxorubicin, compared to control B16F10 cells. *n=4* independent biological replicates were analyzed.

H. GSEA of the signatures "IFN-α response" and "IFN-γ response" (Broad Hallmarks), found upregulated in the RNAseq analysis of senescent B16F10 compared to control cells.

I. Top 5 upregulated Broad Hallmarks from the differential expression analysis (RNAseq) of senescent Panc02, in which senescence was induced by doxorubicin, compared to control Panc02 cells. *n=4* independent biological replicates were analyzed.

J. GSEA of the signatures "IFN-α response" and "IFN-γ response" (Broad Hallmarks), found upregulated in the RNAseq analysis of senescent compared to control Panc02 cells.

K. Top 5 upregulated Broad Hallmarks from the differential expression analysis (RNAseq) of senescent SKMEL-103, in which senescence was induced by palbociclib, compared to control SKMEL-103 cells. *n=4* independent biological replicates were analyzed.

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L. GSEA of the signatures "IFN-α response" and "IFN-γ response" (Broad Hallmarks), found upregulated in the RNAseq analysis of senescent compared to control SKMEL-103 cells.

M. Top 5 upregulated Broad Hallmarks from the differential expression analysis (RNAseq) of senescent IMR-90, in which senescence was induced by palbociclib, compared to control IMR-90 cells. *n=4* independent biological replicates were analyzed.

N. GSEA of the signatures "IFN-α response" and "IFN-γ response" (Broad Hallmarks), found upregulated in the RNAseq analysis of senescent compared to control IMR-90 cells.

O. mRNA expression levels of antigen presentation machinery- and immunoproteasome-related genes in control *versus* senescent murine cancer (B16F10 and Panc02), human cancer (SKMEL-103) and non-cancer (IMR-90) cell lines measured by qRT-PCR (relative to the average expression of housekeeping genes *Actb/ACTB* and *Gapdh/GAPDH*). *n*=2-3 independent experiments. **p<0.01, *p<0.05; unpaired Student's t test control cells.

P. Flow cytometry analysis of H-2K^b/D^b expression in senescent B16F10 or Panc02 cells, treated with doxorubicin, after treatment with blocking antibodies against IFN-γ, IFNAR1 or their respective IgG isotype controls. Senescent cells were treated with doxorubicin at day 0 and collected at day 7. The blocking antibodies were added to the culture medium for the indicated number of days (7d: from day 0 to 7; 3d: from day 4 to 7). Representative histograms showing the fluorescence signal of each stained sample and its unstained control (light gray histogram) of *n*=3 independent experiments is shown.

Q. Flow cytometry analysis of H-2K^b/D^b expression in control and senescent MEFs, treated with doxorubicin, after treatment with the JAK inhibitor SAR-20347 (JAKi). Senescent cells were treated with doxorubicin at day 0 and collected at day 8. JAKi was added to the culture medium at day 1 and maintained for the indicated number of days. Representative histograms showing the fluorescence signal of each stained sample and its unstained control (uncolored histogram) and quantification after autofluorescence subtraction of *n*=3 independent experiments is shown. ***p<0.001, *p<0.01; one-way ANOVA test.

R. Flow cytometry analysis of H-2K^b/D^b expression in control and senescent B16F10 cells, treated with doxorubicin, after treatment with the JAK Inhibitor I (Calbiochem; JAKi). Senescent cells were treated with doxorubicin at day 0 and collected at day 10. JAKi was added to the culture medium at day 0 (induction of senescence) and maintained for the indicated number of days. Representative histograms showing the fluorescence signal of each stained sample and its unstained control (uncolored histogram) and quantification after autofluorescence subtraction of *n*=3 independent experiments is shown. ***p<0.001, *p<0.01; unpaired Student's t test.

S. Flow cytometry analysis of H-2K^b/D^b expression in control and senescent Panc02 cells, treated with doxorubicin, after treatment with the JAK Inhibitor I (Calbiochem; JAKi). Senescent cells were treated with doxorubicin at day 0 and collected at day 7. JAKi was added to the culture medium at day 0 (induction of senescence) and maintained for the indicated number of days. Representative histograms showing the fluorescence signal of each stained sample and its unstained control (uncolored histogram) and quantification after autofluorescence subtraction of *n*=3 independent experiments is shown. ***p<0.001, *p<0.01; unpaired Student's t test.