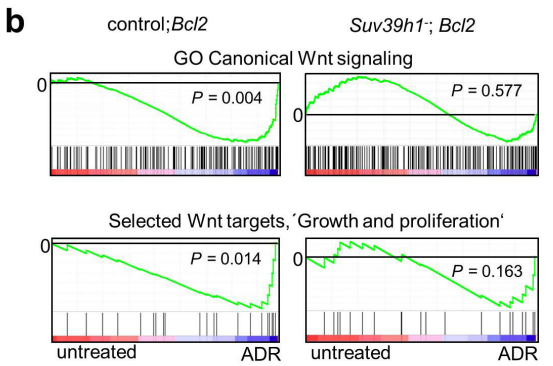
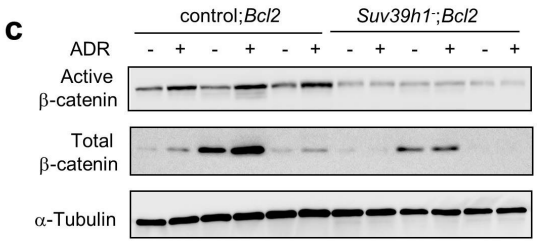
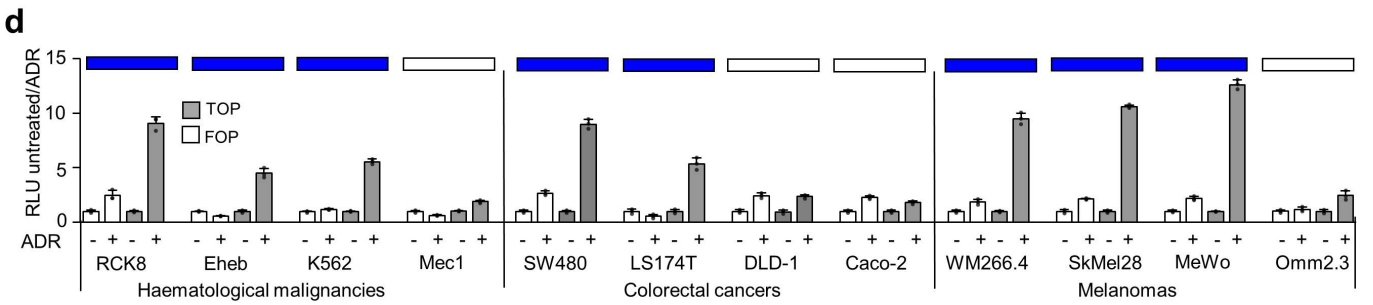
a

Gene set	control;*Bcl2* NES	control;*Bcl2* *P*	Suv39h1⁻;*Bcl2* NES	Suv39h1⁻;*Bcl2* *P*
→ WNT_CELL GROWTH AND PROLIFERATION	1.634	0.014	1.247	0.163
GO NOTCH SIGNALING PATHWAY	1.529	0.001	-0.953	0.570
GO WNT SIGNALING PATHWAY	1.441	0.000	-0.928	0.684
→ GO CANONICAL WNT SIGNALING	1.438	0.004	-0.957	0.577
WNT_STANFORD	1.377	0.047	-0.920	0.614
ST_WNT_BETA_CATENIN_PATHWAY	1.368	0.081	-0.910	0.614
WNT_SIGNALING_PCR_ARRAY	1.331	0.067	-0.951	0.569
PID_WNT_CANONICAL_PATHWAY	1.229	0.207	-1.085	0.363
NOTCH TARGETS_PCR_ARRAY	1.164	0.285	-0.791	0.792
PID_NOTCH_PATHWAY	1.112	0.289	1.086	0.277
REACTOME SIGNALING BY WNT_MOUSE	1.084	0.341	0.870	0.798
PID_WNT_SIGNALING_PATHWAY	1.075	0.389	-1.007	0.473
REACTOME_SIGNALING_BY_NOTCH	0.994	0.464	0.767	0.964
NOTCH SIGNALING_PCR_ARRAY	0.942	0.578	0.919	0.660
GO SMOOTHENED SIGNALING PATHWAY	0.938	0.589	-1.150	0.202
PID_HES_HEY_PATHWAY	0.872	0.667	-1.135	0.262
HEDGEHOG_PCR_ARRAY	0.838	0.771	-1.343	0.052
GO NONCANONICAL WNT SIGNALING	0.807	0.786	-1.316	0.099
PID_WNT_NONCANONICAL_PATHWAY	0.738	0.854	-1.536	0.034
REACTOME SIGNALING BY HEDGEHOG_MOUSE	0.693	0.941	-1.110	0.314
PID_HEDGEHOG_2PATHWAY	-0.977	0.497	-1.339	0.112







Extended Data Figure 5 | Wnt signalling is upregulated in senescence. **a**, GSEA of gene sets probing stem-cell-relevant signalling pathways in ADR-senescent control;*Bcl2* or TIS-incompetent *Suv39h1*⁻;*Bcl2* cells (as in Fig. 1a). Positive NES indicate enrichment in TIS lymphomas. NES of $P < 0.05$ are considered statistically significant and are presented in red. $n = 12$ pairs of independent lymphomas. **b**, GSEA enrichment plots of selected gene sets presented in **a**; GO term 'Canonical Wnt receptor signaling' (top) or subset of proliferation-relevant Wnt target genes (bottom), showing significant enrichment in ADR-senescent control;*Bcl2* but not in TIS-incompetent *Suv39h1*⁻;*Bcl2* cells. **c**, Immunoblot analysis of Ser37- and Thr41-dephosphorylated (that is, stabilized and nucleus translocation-capable 'Active β-catenin') and total β-catenin in three independent pairs of control;*Bcl2* and *Suv39h1*⁻;*Bcl2* lymphoma cells, exposed to ADR for 5 days (+) or left untreated (−). α-Tubulin is used as a loading control. One out of two independent experiments shown. For gel source data, see Supplementary Fig. 1. **d**, Wnt activity measured by the TOPflash TCF reporter system (with FOPflash as negative control) in human cell lines in correlation with their senescence inducibility by ADR, as indicated by blue box symbols for senescence-competent cell lines (referring to Extended Data Fig. 1c). Results reflect mean relative light units fold change (between untreated and ADR-treated samples) of three independent experiments ± s.d.

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