**Supplementary Materials and Methods**

**Creation of T-ALL cell lines that overexpress each of antiapoptotic BCL2 family proteins**

To produce JURKAT and KOPT-K1 cells that overexpress BCL2, we used the MSCV-IRES-GFP (MIG) retroviral expression system. Briefly, the MIG retroviral vector expressing the wild-type *BCL2* cDNA as well as *GFP*, MIG-*BCL2*-wt, or the control MIG vector was cotransfectedinto HEK293T cells with the packaging plasmid pMD-MLV and envelope plasmid VSV-Gusing FuGENE 6 reagent (Roche, Basel, Switzerland). Supernatants containing the retrovirus were collected and filteredthrough a 0.45-μm cellulose acetate membrane filter. JURKAT and KOPT-K1 cell lines were then infected with the retrovirus inthe presence of polybrene (8 μg/ml) and HEPES (10 mM) by centrifugation at 2,500 rpm for 1.5 h at30°C. GFP-positive cells were sorted by FACSAria (BD Biosciences, San Jose, CA, USA) and the expression of BCL2 was confirmed by western blot analysis using BCL2 antibody (Cell Signaling Tech, Danvers, MA, USA, #4223). JURKAT and KOPT-K1 cells that overexpress *BCLXL* or *MCL1* cDNA were generated with the pHAGE-CMV-IRES-ZsGreen lentiviral expression system. ZsGreen-positive cells were sorted by FACSAria (BD Biosciences), and the expression of each protein was confirmed by Western blot with each specific antibody (Cell Signaling Tech).

**shRNA knockdown experiments**

All shRNA constructs cloned into the lentiviral vector pLKO.1-puro were obtained from the RNAi Consortium (Broad Institute, Cambridge, MA, USA). Target sequences for each shRNA are listed in Supplementary Table 2. Each construct was cotransfectedinto HEK293T cells with the packaging plasmid psPAX2 and envelope plasmid pMD2.G using FuGENE 6 reagent (Roche). Supernatants containing the lentivirus were collected and filteredthrough a 0.45 μm cellulose acetate membrane filter. T-ALL cell lines were then infected with lentivirus inthe presence of polybrene (8 μg/ml) and HEPES (10 mM) by centrifugation at 2,500 rpm for 1.5 h at30°C, and the infected cells were selected by puromycin for at least 36 h. T-ALL cell lines transduced with each of two *BIM*-targeting shRNAs or a control luciferase shRNA were treated with AUY922 or DMSO starting 4 days after infection.

**Apoptosis and cell-cycle analysis**

The TUNEL assay and propidium iodide (PI) staining were performed with the APO-BrdUTM TUNEL assay kit (Invitrogen, Waltham, MA, USA) according to the manufacturer’s recommendation. Briefly, 2 x 106 cells of each treated sample were fixed with 1% paraformaldehyde in phosphate-buffered saline (PBS) for 15 min on ice, washed in PBS and incubated in 70% ethanol at -20°C overnight. After washing and incubation in DNA labeling solution containing deoxynucleotidyl transferase (TdT) and bromoylated deoxyuridine (BrdU) triphosphates for 4 h at 37°C, the cells were washed and incubated in staining buffer containing an Alexa Fluor 488 dye-labeled anti-BrdU antibody for 30 min of incubation at room temperature, followed by addition of a PI/RNase mixture. After 30 min incubation at room temperature, TUNEL positivity and cell-cycle distribution were analyzed by BD FACSCalibur (BD Biosciences). The threshold for TUNEL positivity was determined as the maximal TUNEL signal observed in the nontreated cells.