**Legends to Supplemental Information**

Table S1. JQ1 sensitivity and oncogene mutation or DNA copy number status of small cell lung cancer cell lines. Genomic information was obtained from the COSMIC database (23).

Table S2. Microarray data for the 5 probe sets that show differential responses to JQ1 treatment. Shown are the Affymetrix RMA anti-log values of probe intensity with each treatment, together with the fold change in signal from JQ1 treatment and the JQ1 concentrations needed to achieve 50% increase or decrease in signal (EC50).

Figure S1. Potency of I-BET762 in inhibition of proliferation of lung tumor cell lines. Lineage of lung cell lines is as indicated.

Figure S2. Dose response curves of JQ1 in cell proliferation assays. Shown are examples of lung tumor cell lines with different sensitivity to JQ1.

Figure S3. Induction of apoptosis in four SCLC cell lines was monitored by caspase 3 and 7 cleavage after 72 h treatment with JQ1. Data shown are fold changes over DMSO control.

Figure S4. Probe sets induced by JQ1 in SCLC cell lines. Shown are microarray data for three probe sets that were induced by JQ1.

Figure S5. Examples of probe sets that show dose-dependent changes, but were expressed only at background levels (RNF183) in all four cell lines, or were expressed at low levels in the sensitive cell lines (NR0B2).

Figure S6. Dose response in expression of the three *ASCL1* probe sets upon JQ1 treatment.

Figure S7. (A) Enrichment of BRD4 binding at the *ASCL1* gene enhancer compared to a gene desert on the same chromosome. Primers specific for *ASCL1* enhancer or a gene desert on chromosome 12 were used to detect BRD4 binding. (B) JQ1 has no effect on non-specific binding of BRD4 to a gene desert in SCLC cell lines.

Figure S8. (A) *ASCL1* mRNA in SCLC and non-small-cell lung neuroendocrine (UMC-11 and NCI-H1155) cell lines. JQ1 sensitivity cut-off is arbitrarily defined as an IC50 of 0.5 µM. (B) ASCL1 protein abundance in SCLC cell lines that are sensitive or resistant to JQ1. (C) UMC-11 cells were treated with JQ1 for 24h and ASCL1 protein was analyzed by western blotting.