Supplemental Methods

Cell lines and primary cells
The mantle cell lymphoma lymphoma (MCL) cell lines: JeKo1 and HBL2 (kindly provided by Dr. Lydia Visser, Department of Pathology, University Medical Center Groningen, the Netherlands with permission of Dr. Wolfram Klapper, Department of Pathology, University of Kiel, Germany), and Rec1 (DSMZ) were cultured in RPMI-1640 medium supplemented with 10% fetal calf serum, glutamine and pen/strep. Peripheral blood-derived MCL and CLL cells were obtained after routine diagnostic or follow-up procedures at the departments of Hematology or Pathology of the Academic Medical Center (AMC) Amsterdam, and were purified using Ficoll and eventually by B cell isolation kit (negative selection) (Miltenyi Biotec). Purified MCL and CLL samples contained 85-99% CD5+/CD19+ cells. This study was conducted and approved by the AMC Medical Committee on Human Experimentation. Informed consent was obtained in accordance with the Declaration of Helsinki.

Adhesion assays
The cell adhesion assays were performed essentially as described.\textsuperscript{1,2} In detail, adhesion assays were done in triplicate on EIA/RIA 96-well plates (Costar) coated with PBS containing 10µg/ml fibronectin (Sigma-Aldrich) or 500ng/ml VCAM-1 (R&D Systems) at 4°C overnight, or with 1mg/ml poly-L-lysine (PLL; Sigma-Aldrich) at 37°C for 15 minutes, and blocked with 4% BSA/RPMI at 37°C for 1h. Cells were pretreated with DMSO, ibrutinib (Selleck Chemicals), and/or idelalisib (Selleck Chemicals) in 1%BSA/RPMI at 37°C for 1h. If required (wash-out experiment), ibrutinib was washed out for 3 times 5 min with 1%BSA/RPMI. Subsequently, cells were stimulated with either 200ng/ml goat (Fab’)2 anti-human IgM (LE/AF; Southern Biotech), or 50ng/ml phorbol-12-myristate-13-acetate (PMA; Sigma-Aldrich), and 1.5x10^5 cells in 100µl were immediately plated and incubated at 37°C for 30 minutes. If required (detachment experiment), only now the cells were treated with ibrutinib, for 2h. After extensive washing of the plate with 1% BSA/RPMI to remove non-adhered cells, the adherent cells were fixed for 10 minutes with 10% glutaraldehyde/PBS and subsequently stained for 45 minutes with 0.5% crystal violet/20% methanol/water. After extensive washing with water, the dye was eluted in methanol and absorbance was measured after 40 minutes at 570nm on a spectrophotometer (Multiskan RC spectrophotometer, Thermo labsystems). Background absorbance (no cells added) was subtracted. Absorbance due to nonspecific adhesion, as determined in wells coated with 4% BSA, was always less than 10% of the absorbance of anti-IgM-stimulated cells. Maximal adhesion (100%) was determined by applying the cells to wells coated with PLL, without washing the wells before fixation. Adhesion of the non-pretreated anti-IgM-stimulated cells was normalized to 100% and the bars represent the means + SEM of at least three independent experiments, each assayed in triplicate, or means + SEM of a representative experiment of at least two independent experiments, assayed in triplicate.

Synergistic calculations
CompuSyn (ComboSyn, Inc.), was used for calculating combination indices and creating FaCI-plots, and were based on the Chou-Talalay method.\textsuperscript{3}

Statistics
Graphpad Prism (GraphPad Software Inc.) was used for all graphs and statistics. All multcomparisons were analyzed by a one-way analysis of variance (ANOVA). A post
Dunnett's $t$-test was carried out following a significant ANOVA, comparing the drugs treatments to the DMSO-controls. $^* p<0.05; ^* * p<0.01; ^* * * p<0.001.$

References