**Text S1.**

Deamidation Has No Effect on the Interaction of Bcl-xL with Bim or Bax

We first found that endogenous Bim binds the endogenous native and deamidated forms of Bcl-xL equally well in both untreated and etoposide-treated cells (Figure S2A). We then examined binding in a cell line in which the expression of Bim is inducible and Bcl-xL is constitutively overexpressed. The use of these cells allowed us to vary the ratio of Bim to Bcl-xL, such that we could examine the interaction between the two at limiting concentrations of Bim to determine if its affinity for each form of Bcl-xL is the same. Additionally, because Bcl-xL is overexpressed in these cells, any potential confounding effects of Bim-induced cell death were decreased. We found that even at limiting concentrations of Bim the ratio of bound deamidated to bound native Bcl-xL remains proportional to the input of each form in both untreated cells (Figure S2B) and etoposide-treated cells (Figure S2C), indicating that the affinity of Bim for the deamidated and native forms of Bcl-xL is the same. We were concerned that the deamidated forms of Bcl-xL might only coimmunoprecipitate with Bim because the deamidated forms are bound either directly or indirectly to the native form of Bcl-xL. We addressed this possibility by examining the interaction between the deamidated and native forms of Bcl-xL *in vivo*. When HA-tagged Bcl-xL and untagged Bcl-xL were coexpressed and the cells were treated with etoposide, the deamidated and native forms of both the HA-tagged and untagged Bcl-xL coimmunoprecipitated with Bim; however, there was no interaction whatsoever between the HA-tagged and the untagged forms of Bcl-xL (Figure S2D). Together, these findings demonstrate that deamidation has no effect on the interaction of Bcl-xL with Bim. Our findings were similar when we examined the interaction of Bcl-xL with Bax (Figure S2E).

**Supporting methods**

Plasmids and Bacterial Protein Synthesis

Bim-inducible SAOS-2 cells was described previously [16]. To generate purified bacterially synthesized Bcl-xL proteins for direct assessment of the effects of pH on deamidation, pTri Ex-1.1-Bcl-xL(ΔTM) and pTri Ex-1.1-Bcl-xL(N52A/N66A/ΔTM) were constructed by ligation of the cDNA for codons 1 to 209 of each Bcl-xL cDNA construct between the *Nco I* site and the *Bst1107I* site in the plasmid pTri Ex-1.1. The proteins encoded by these constructs were expressed in bacteria and purified using standard techniques. Assessment of the effect of pH on Bcl-xL deamidation was performed as previously described [16]. We thank Dr. Eunhee Kim for providing pGFP-Bax plasmid.

Immunoblotting and Immunoprecipitation

The following antibodies were used: anti-Bim (AAP-330) from Stressgen for immunoblotting; anti-Bim (AM53) from Calbiochem and anti-GFP (G10362) from Invitrogen for immunoprecipitation.