Tumor cells that harbor genetic mutations and are recognized as abnormal should be naturally eliminated but they maintain their existence by a combination of multiple activities – also known as the hallmarks of cancer [1]. One of these hallmarks is the evasion of apoptosis, the programmed cell death. The restoration of the apoptotic cascade in tumor cells has long been recognized as a promising way to treat cancer but the major members of this protein family, BCL2, MCL1, and BCL-xL have long remained elusive targets decades long for drug discovery. Recently the decade long efforts of the pharmaceutical industry have been rewarded by the identification of potent and selective inhibitors for some family members [2].

The presentation overviews the principal pharmacological and chemical challenges of targeting this protein family and presents the recent scientific [3] and pharmacological achievements in this area.