Cellular stresses that increase AMP:ATP and AMP:ATP ratios activate AMPK in normal cells by promoting its phosphorylation by LKB1. This triggers inhibition of cell growth by phosphorylation of acetyl-CoA carboxylase (ACC), Raptor and other targets, and inhibition of the cell cycle by up-regulation of the cyclin-dependent kinase inhibitor, CDKN1A. This mechanism fails, due to the lack of sufficient upstream kinase activity, in tumor cells that have lost the tumor suppressor LKB1. However, it can be restored by increasing cell Ca^{2+} to activate the alternate Ca^{2+}-dependent upstream kinase, CAMKK2.