Simultaneous Inhibition of the PI3K/mTOR and Raf/MEK/ERK Pathways in Melanoma

Schlenker, Darbi

Melanoma stands as a growing problem in the world, and kills thousands of people every year. In an attempt to find a method of limiting the rapid proliferation and unchecked growth exhibited by this cancer, simultaneous and independent inhibition of the Raf/MEK/ERK and PI3K/mTOR pathways was studied. These pathways are generally upregulated in melanoma cells, and can be connected to the unchecked growth exhibited by many tumors. Independently, the pathways display a connection to uncontrollable proliferation, but they are thought to act synergistically, with one pathway showing expanded activity if the other becomes blocked. By measuring the difference in proliferation rates in melanoma cells treated with pathway inhibitors singularly and dually, the effectiveness of blocking the pathway simultaneously is measured, as well as the relation between them. Ultimately, the hypothesis was supported, and data showed a correlation between the Raf/MEK/ERK and PI3K/mTOR pathways, and that dual inhibition of the pathways is more effective at reducing tumor size than individual inhibition.

Awards Won: