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A Mini-Review on the Insight into the Effect of Natural and Synthetic α,β-Unsaturated Carbonyl-Containing Compounds on PI3K/AKT/mTOR Signaling Pathways to Treat Breast Cancer

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Abstract
Breast cancer, which has been one of the most frequently diagnosed cancers worldwide for decades, continues to defy treatment. While researching a remedy to this problem, it was discovered that mTOR has a strong association with breast cancer. Uncontrolled activation of mTOR is shown in a variety of different cancer, making it a critical target for cancer treatment. Inhibition of the mTOR protein kinase can cause autophagic cell death. It is known that covalent inhibitors have become a prominent issue in drug discovery, with covalent inhibitors focusing on α,β-unsaturated carbonyl molecules. Structural modifications to α,β-unsaturated carbonyl may be one of the finest avenues for developing the best breast cancer medication. This review article discusses recent research on natural and synthetic α,β-unsaturated carbonyls and their anti-cancer properties targeting on mTOR, with SAR to showcase the efficacy of synthetic natural products compared to parental compounds using both biological assays and in silico studies. © 2022 World Scientific Publishing Company.

Author Keywords
breast cancer; molecular docking; mTOR pathway; SAR; α, β -unsaturated carbonyl

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