IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 1, November 2025
Impact Factor: 7.67

Repurposing Metformin: A New Frontier in Cancer Therapy

Shrenika Patil, Samiksha Sawant, Ms Chandani Kamble
Nootan College of Pharmacy, Kavathe Mhankal

Abstract: *Metformin, a first-line medication for type 2 diabetes, has attracted considerable attention for its potential anticancer properties. In addition to its role in regulating blood glucose, emerging evidence suggests that metformin can disrupt cancer cell metabolism, suppress cell growth, and promote programmed cell death. These effects appear to involve several molecular pathways, particularly the activation of AMP-activated protein kinase (AMPK) and the suppression of the mammalian target of rapamycin (mTOR) signaling pathway. Furthermore, by lowering systemic insulin levels, metformin may reduce insulin-mediated tumor progression. Given its well-established safety record, affordability, and widespread clinical use, metformin is being actively explored as a repurposed therapeutic option in oncology. This paper summarizes recent research, mechanistic insights, and ongoing clinical studies that support metformin's emerging role as an anticancer agent.*

Keywords*:* Metformin, Cancer Treatment, Drug Repositioning, AMPK Pathway, mTOR Suppression, Antitumor Mechanisms, Oncology Studies, Cancer Cell Metabolism, Type 2 Diabetes Mellitus, Cell Apoptosis

DOI: 10.48175/IJARSCT-29680