Unlocking the potential of targeted therapies for multiple myeloma

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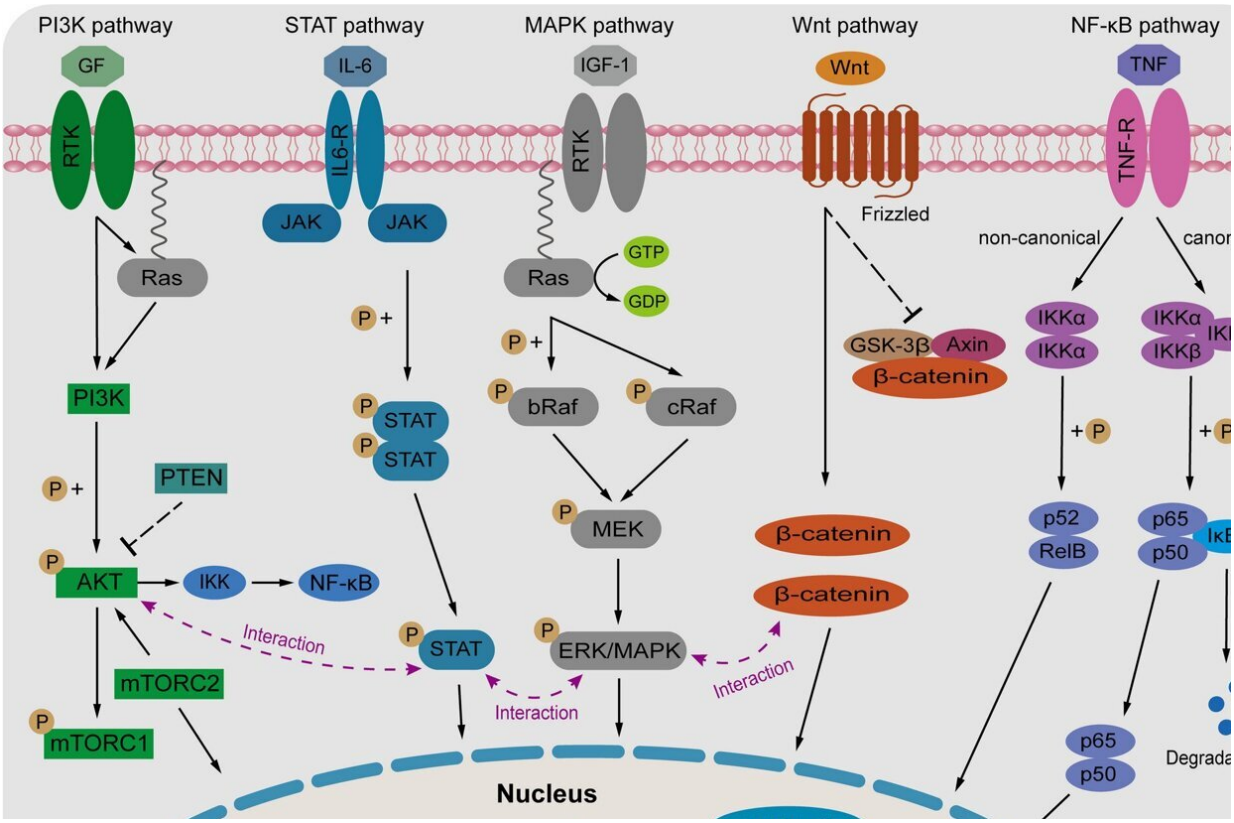

Signaling pathways in the pathogenesis of multiple myeloma. Signaling pathways such as PI3K/AKT/mTOR, JAK/STAT, RAS/MAPK, Wnt/β-catenin and NF-κB pathway participate the pathogenesis of MM by mediating the proliferation, migration, expansion, survival, angiogenesis and drug resistance of MM cells. Credit: *Molecular Biomedicine* (2024). DOI: 10.1186/s43556-024-00188-w

Multiple myeloma (MM) is a complex hematological malignancy with significant unmet needs. While conventional therapies have significantly improved patient survival, the disease remains incurable. A review, led by Qizhong Lu, Donghui Yang, Ting Niu, and Aiping Tong, explores the multifaceted nature of MM and the promising potential of targeted therapies.

The work is published in the journal *Molecular Biomedicine*.

The authors delve into the key signaling pathways that drive MM pathogenesis, including the PI3K/AKT/mTOR, RAS/MAPK, JAK/STAT, Wnt/β-catenin, and NF-κB pathways. Aberrant activation of these pathways contributes to the proliferation, survival, migration, and drug resistance of myeloma cells. The review provides a comprehensive overview of the roles of these pathways in MM, highlighting their potential as therapeutic targets.

The authors also discuss the progress made in developing targeted immunotherapies for MM. This includes monoclonal antibodies, ADCs, BsAbs, immune checkpoint inhibitors, CAR-T cells, CAR-NK cells, and TCR-T cells. The review explores the mechanisms of action of these therapies, their efficacy in clinical trials, and the challenges that remain in their development.

Key findings from the review include:

- Signaling pathways are key drivers of MM pathogenesis. The authors demonstrate how aberrant activation of these pathways fuels MM cell growth and survival.
- Targeted therapies offer new hope for MM patients. The review highlights the impressive progress made in developing monoclonal antibodies, ADCs, BsAbs, and CAR-T therapies that target specific pathways and antigens in MM.

- Challenges remain in MM treatment. The review acknowledges the need for further research to overcome challenges such as high treatment costs, resistance mechanisms, and potential side effects.

The authors conclude by emphasizing the need for continued research and development of targeted therapies for MM. They call for a focus on enhancing the specificity and efficacy of these therapies, developing more affordable treatment options, and investigating combination therapies to address resistance mechanisms. They also emphasize the importance of personalizing treatment regimens for individual patients.

More information: Qizhong Lu et al, Multiple myeloma: signaling pathways and targeted therapy, *Molecular Biomedicine* (2024). DOI: 10.1186/s43556-024-00188-w

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