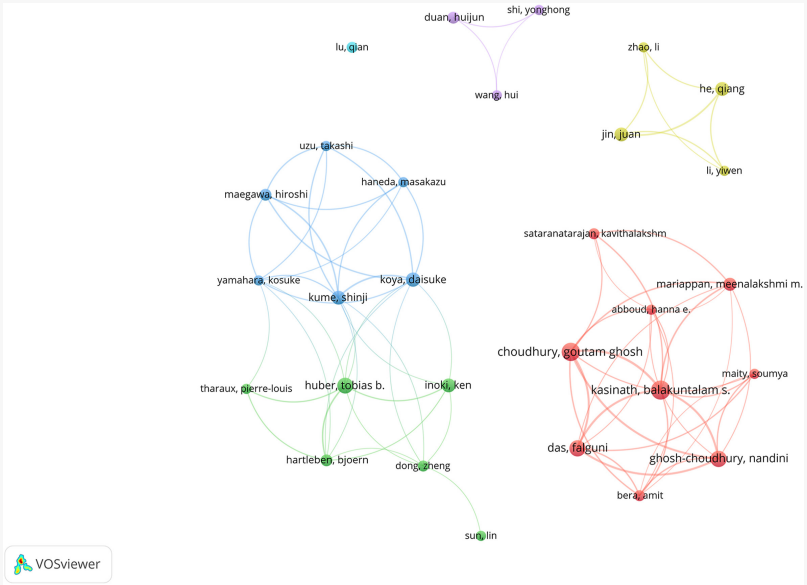
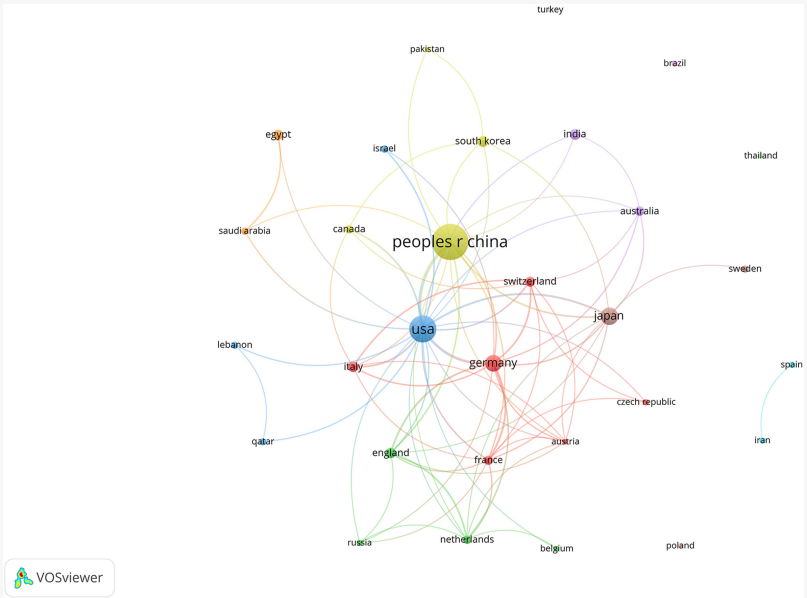
Identification of the mTOR Pathway as a Key Target for Diabetic Nephropathy Treatment

SHANNON, CLARE, IRELAND, February 25, 2025 /EINPresswire.com/ -- A newly published study in Genes & Diseases highlights the crucial role of the mammalian target of rapamycin (mTOR) pathway in the progression of diabetic nephropathy (DN) and explores its potential as a therapeutic target. This study provides significant insights into the mechanisms underlying DN and offers potential directions for more effective treatment strategies.



Network map of 29 authors with frequency greater than five.



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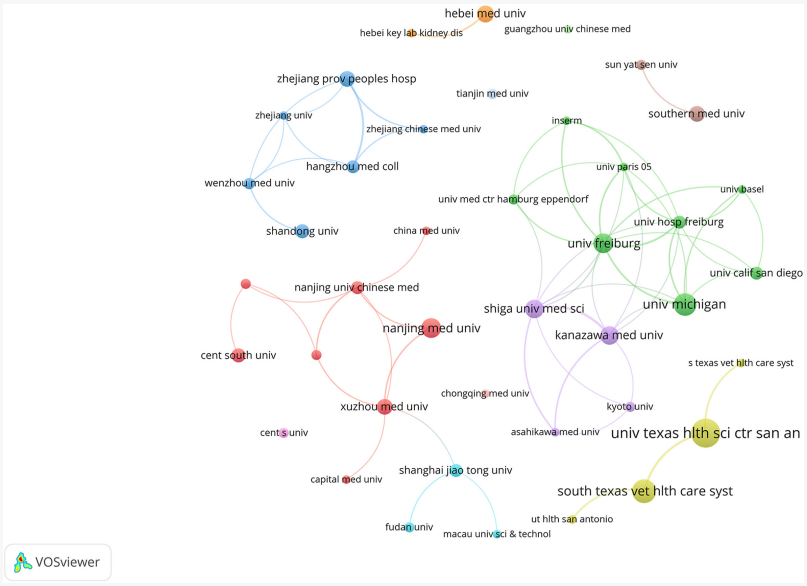
Diabetic nephropathy remains a major complication of diabetes and a leading cause of end-stage renal disease worldwide. Despite advances in diabetes management, no current treatments effectively halt or reverse kidney damage associated with DN. This research focuses on how the mTOR pathway influences key renal cells in DN progression, providing a comprehensive understanding of its role in kidney damage.

The study reveals that excessive activation of mTOR contributes to kidney injury by inhibiting autophagy, increasing oxidative stress, and promoting inflammation. It examines the impact of mTOR on podocytes, glomerular mesangial cells, renal tubular epithelial cells, and glomerular endothelial cells—each

playing a crucial role in kidney function. Additionally, the involvement of macrophages and T lymphocytes is explored, shedding light on the immune system's role in DN progression.

Further, the study reviews recent advancements in DN treatment strategies targeting mTOR. Drugs such as rapamycin have demonstrated potential in preclinical models, offering promising avenues for future therapies. However, challenges remain, including the need to balance mTOR inhibition with immune system function and metabolic health.



Network map of 41 institutions with a frequency greater than five.

As diabetic nephropathy cases continue to rise, this research underscores the urgency of developing targeted treatments. The findings support further clinical investigations into mTOR-targeting drugs to assess their potential benefits in DN management.

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