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Human umbilical cord mesenchymal stem cells attenuate diabetic nephropathy through the IGF1R-CHK2-p53 signalling axis in male rats with type 2 diabetes mellitus

Key words: IGF1R, CHK2, p53, Diabetes mellitus, HUcMSC, DNA damage repair

Research Summary

This research mainly focused on: Human umbilical cord-derived MSC (HUcMSC) -mediated enhancement of diabetic nephropathy via the IGF1R-CHK2-p53 signalling pathway.

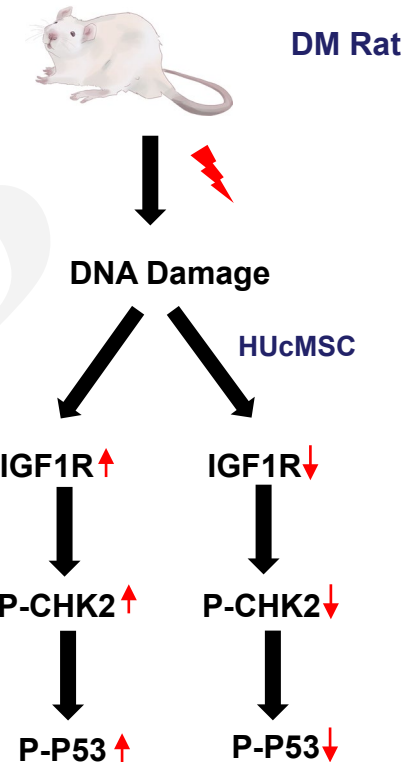
- HUcMSCs downregulated the expression of IGF1/IGF1R in the renal tissue of diabetic rats.
- HUcMSCs inhibited the activity of the target genes CHK2 and p53, reduced apoptosis, and improved diabetic nephropathy.
- HUcMSC-mediated enhancement of diabetic nephropathy via the IGF1R-CHK2-p53 signalling pathway

Innovation points

- **Introduction** Human umbilical cord-derived MSC (HUcMSC) infusion induces antidiabetic effects in type 2 diabetes mellitus (T2DM) rats. Insulin-like growth factor 1 receptor (IGF1R) promote glucose metabolism in diabetes.

- **Summary** IGF1R could interact with CHK2 and mediate DNA damage. HUcMSC infusion improved diabetic nephropathy

- **Emphasis** The treatment of diabetes and its complications with umbilical cord stem cells is closely related to the repair of DNA damage. CHK2 can be used as a new target for treating diabetes and its complications.



Innovation points

- 1 | HUcMSC infusions reduce inflammation levels and improve renal biological changes and alleviate renal pathological changes in T2D rats.**
- 2 | HUcMSC treatment was beneficial in protecting against diabetes-induced damage.**
- 3 | IGF1R protein expression levels were upregulated in STZ-induced diabetic kidneys.IGF1R participates in the DNA damage repair pathway.**
- 4 | p-CHK2 and p-p53 protein expression levels were increased in STZ-induced diabetic kidney tissue.**