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ADP-ribosylhydrolases: from DNA damage repair to COVID-19

Keywords: DNA damage repair, SARS-CoV-2, ADP-ribosylation, macrodomain, ADP-ribosylhydrolase, deADP-ribosylation

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Research Summary

The macrodomain ADP-ribosylhydrolases are involved in the removal of ADP-ribosylation, and play important roles in DNA damage repair. This review focused on the following aspects:

- Human macrodomain ADP-ribosylhydrolases
- Human catalytically inactive macrodomain proteins
- Macrodomain in lower organisms
- Viral macrodomain proteins

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Innovation points

- **Introduction** of the macrodomain proteins of different species from biological functions to structural characteristics.
- **Summary** of catalytic mechanisms of these macrodomains in the hydrolyzation of ADP-ribose, their biological functions in DNA damage repair, and structural differences of enzymatically active and inactive macrodomains.
- **Emphasis** of targeting viral macrodomains to treat virus-induced diseases.

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Innovation points

- **A series of structural figures are generated to compare these macrodomain proteins.**

- **Figure 2 Structural analysis of human ADP-ribosylhydrolases.**

- **Figure 3 Structural analysis of enzymatically inactive macrodomains.**

- **Figure 4 Structural analysis of viral macrodomains from CHIKV, SARS and SARS-CoV-2.**

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