Prophylactic supplementation with *Bifidobacterium infantis* or its metabolite inosine attenuates cardiac ischemia/reperfusion injury

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- *Bifidobacterium infantis*, a well-known probiotic, exhibits prophylactic cardioprotective effects against myocardial I/R injury.
- The cardioprotective effects of *Bifidobacterium infantis* are recapitulated by its metabolite inosine.
- Inosine treatment suppresses cardiac inflammation by reducing the production of proinflammatory cytokines and regulating immune cells after I/R.
- Inosine treatment attenuates cell death by serving as an alternative carbon source for ATP generation through the purine salvage pathway in stressed myocytes and in I/R-injured mouse hearts.
Figure 1. The gavage of *B. infantis* mitigated cardiac injury in mouse hearts following ischemia/reperfusion (I/R).
Results

Figure 2. The gavage of *B. infantis* decreased cardiac fibrosis and cell apoptosis in mouse hearts following I/R.
Figure 3. Inosine recapitulated the cardioprotective effects of *B. infantis* in mouse hearts against I/R.
Results

Figure 4. Transcriptional analysis revealing the improved energy metabolism and suppressed immune response in mouse hearts subjected to I/R surgery and inosine treatment.
Figure 5. Inosine reduced cardiac inflammation after I/R via the activation of the anti-inflammatory A(2A) receptor.
Figure 6. Inosine attenuated cardiac cell death by serving as an alternative carbon source for ATP generation through the purine salvage pathway.
Summary

❑ Our study demonstrates the prophylactic potential of *Bifidobacterium infantis* and its metabolite inosine in mitigating I/R injury after acute MI.

❑ Inosine exerts an anti-inflammatory effect on immune cells and functions as an alternative energy source to alleviate cardiac cell death following I/R.

❑ This study offers crucial insights for the translational application of *Bifidobacterium infantis* and its metabolite inosine in preventing, and potentially treating, myocardial I/R injury and even a broader range of cardiovascular diseases.

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