



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

Hao Zhang<sup>1,2\*</sup>, Jiawan Wang<sup>1,3\*</sup>, Jianghua Shen<sup>1,2,4\*</sup>, Siqi Chen<sup>1,2,4</sup>, Hailong Yuan<sup>1,4,5</sup>, Xuan Zhang<sup>2,6</sup>, Xu Liu<sup>1,2,4</sup>, Ying Yu<sup>2,6</sup>, Xinran Li<sup>1,2,4</sup>, Zeyu Gao<sup>1,4,7</sup>, Yaohui Wang<sup>5</sup>, Jun Wang<sup>2,6#</sup>, Moshi Song<sup>1,2,4,7#</sup>

<sup>1</sup>Key Laboratory of Organ Regeneration and Reconstruction, State Key Laboratory of Membrane Biology, Institute of Zoology, Chinese Academy of Sciences, Beijing 100101, China

<sup>2</sup>University of Chinese Academy of Sciences, Beijing 100049, China

<sup>3</sup>Beijing Chao-Yang Hospital, Department of Anesthesiology, Beijing 100020, China

<sup>4</sup>Beijing Institute for Stem Cell and Regenerative Medicine, Beijing 100101, China

<sup>5</sup>Joint National Laboratory for Antibody Drug Engineering, Henan University, Kaifeng 475004, China

<sup>6</sup>CAS Key Laboratory of Pathogenic Microbiology and Immunology, Chinese Academy of Sciences, Beijing 100101, China

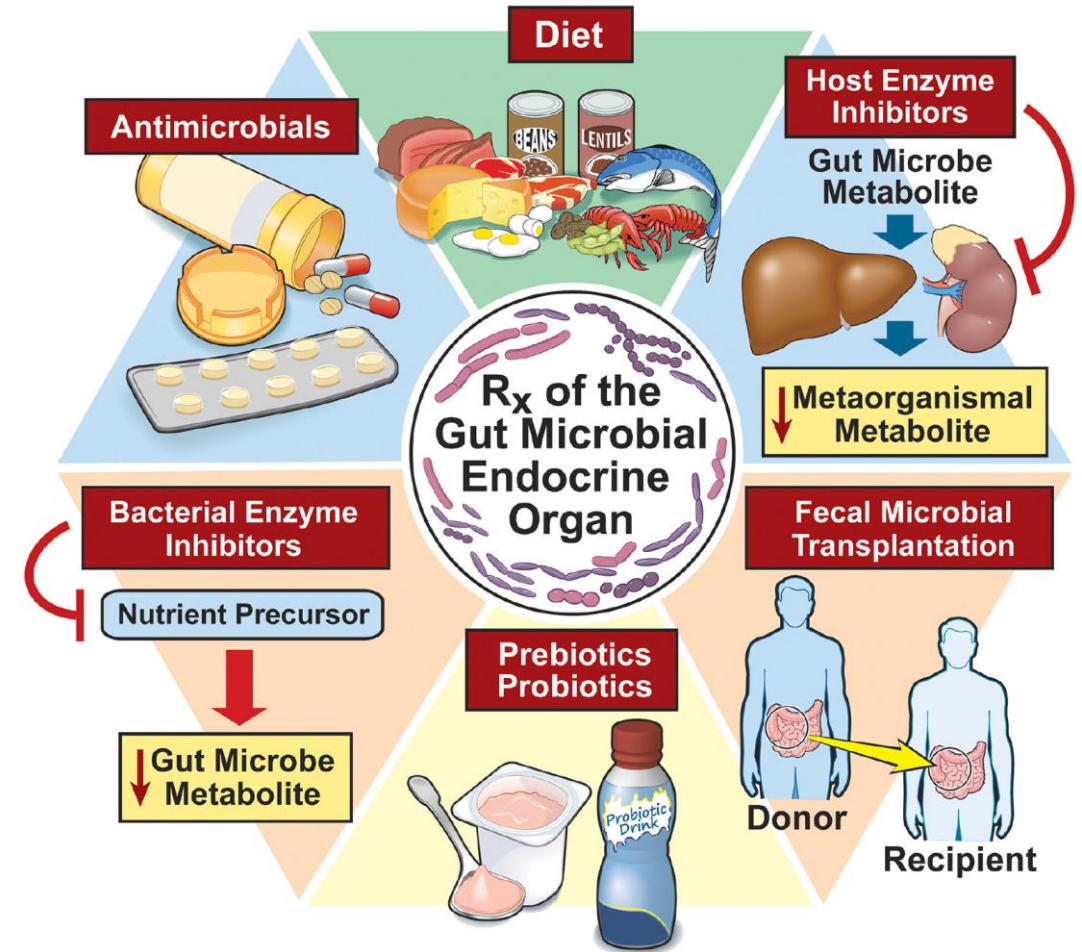
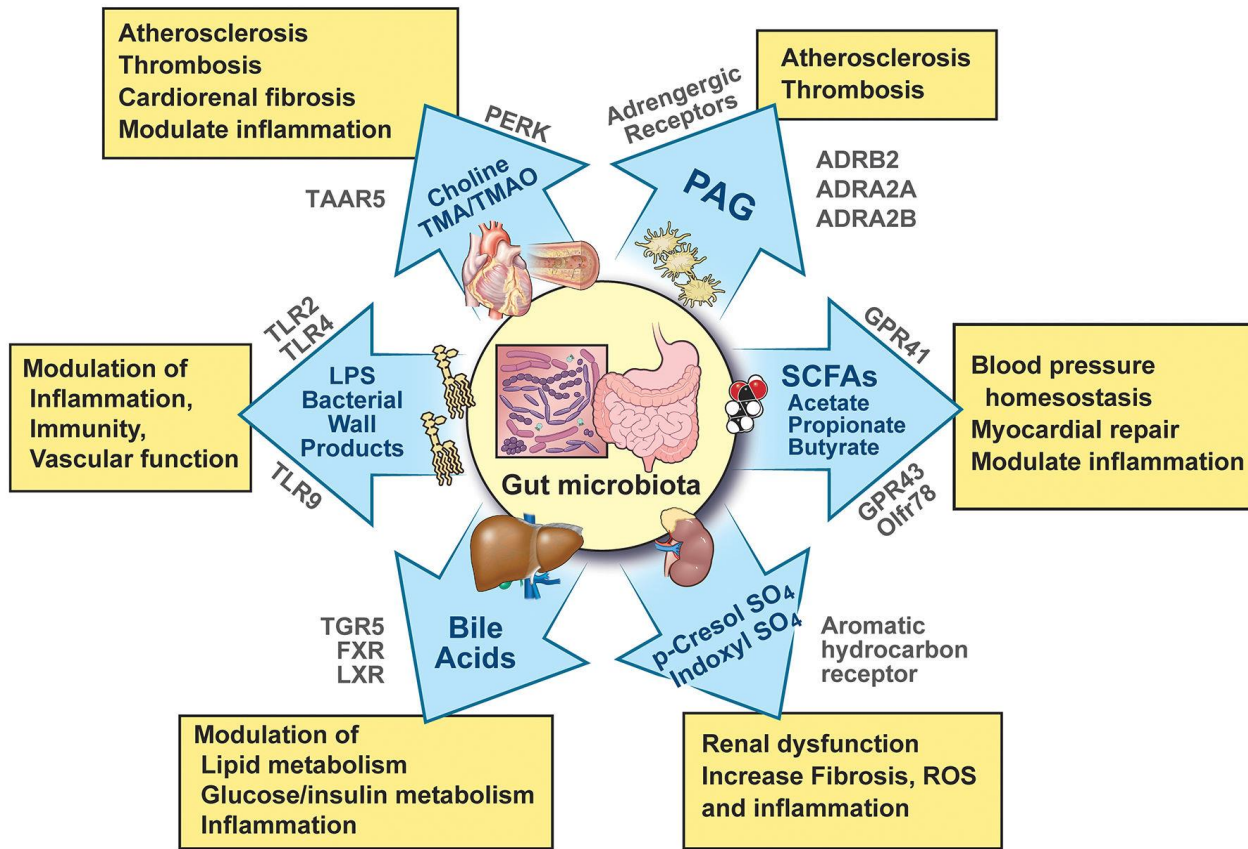
<sup>7</sup>Institute for Stem Cell and Regeneration, Chinese Academy of Sciences, Beijing 100101, China



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# Introduction



Witkowski M, Weeks TL, Hazen SL. Gut Microbiota and Cardiovascular Disease. *Circ Res.* 2020 Jul 31;127(4):553-570. doi: 10.1161/CIRCRESAHA.120.316242. Epub 2020 Jul 30. PMID: 32762536; PMCID: PMC7416843.

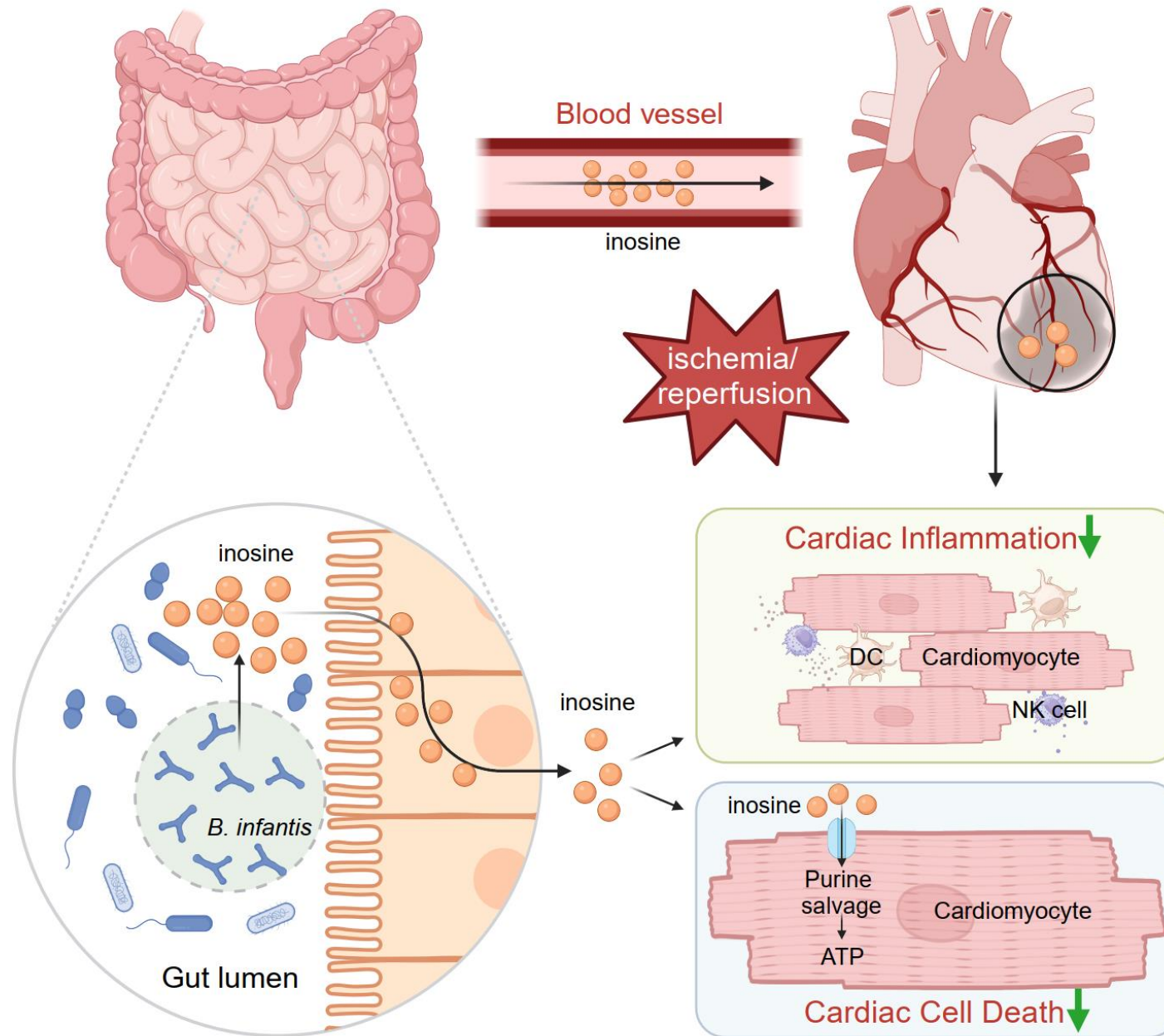


# Highlights

- *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.



# Overview



# Results

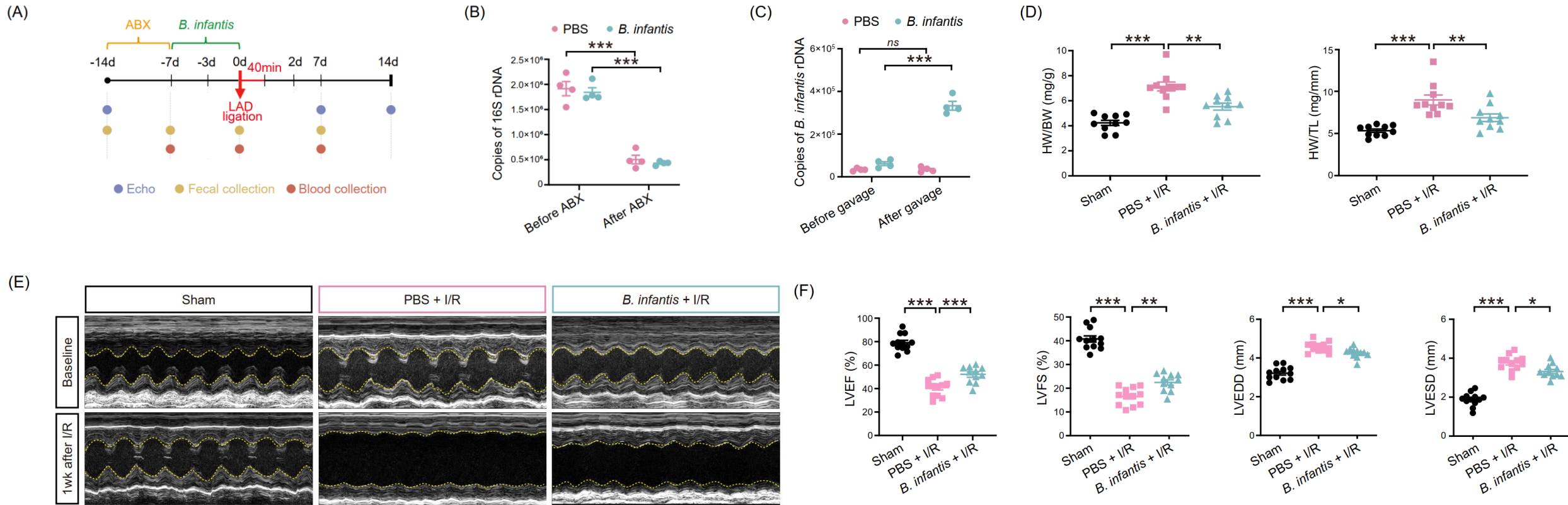


Figure 1. The gavage of *B. infantis* mitigated cardiac injury in mouse hearts following ischemia/reperfusion (I/R).

# Results

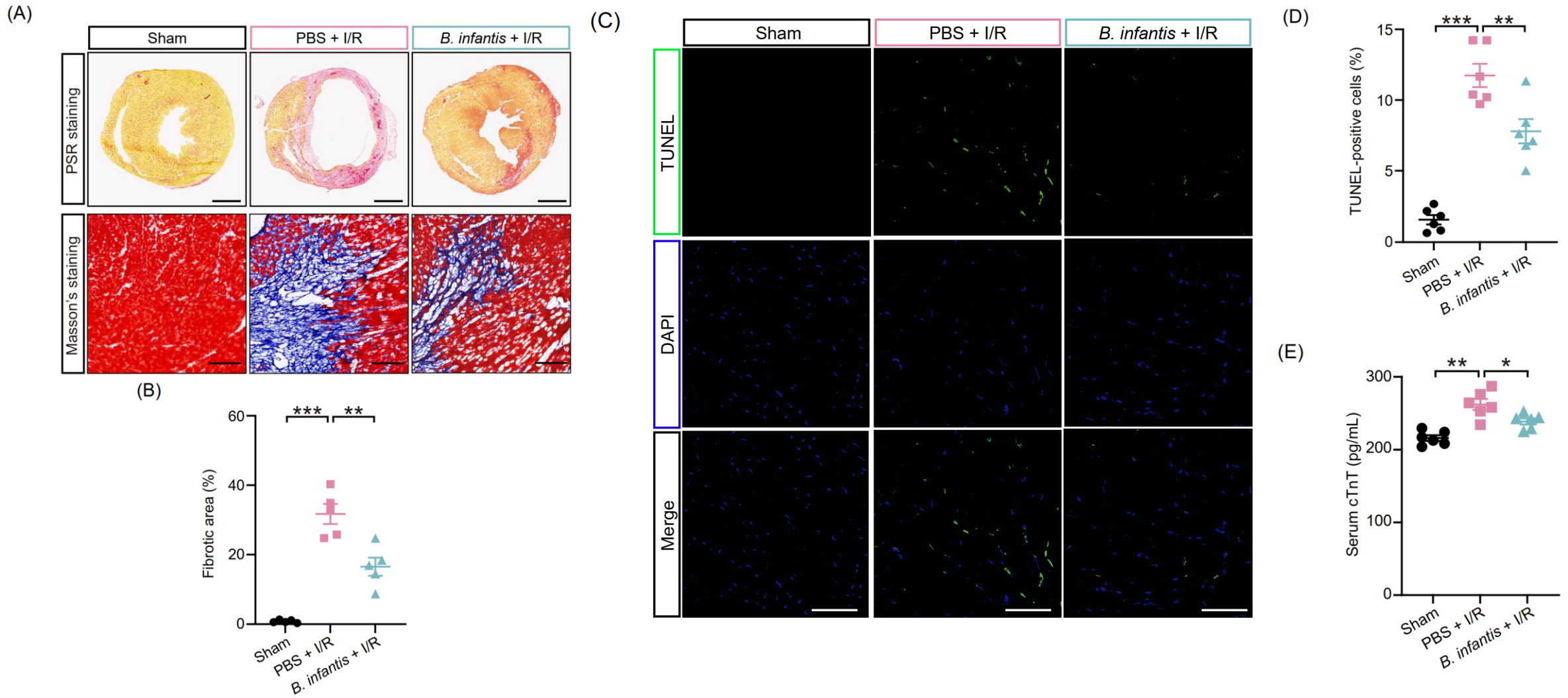


Figure 2. The gavage of *B. infantis* decreased cardiac fibrosis and cell apoptosis in mouse hearts following I/R.

# Results

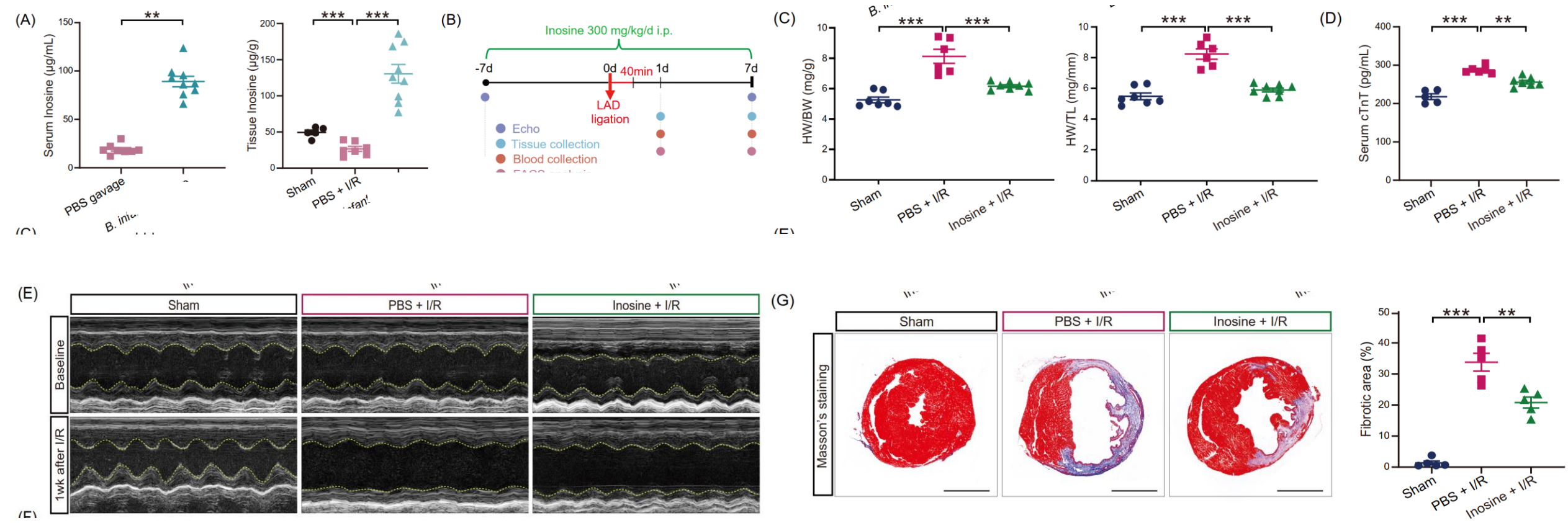


Figure 3. Inosine recapitulated the cardioprotective effects of *B. infantis* in mouse hearts against I/R.

# Results

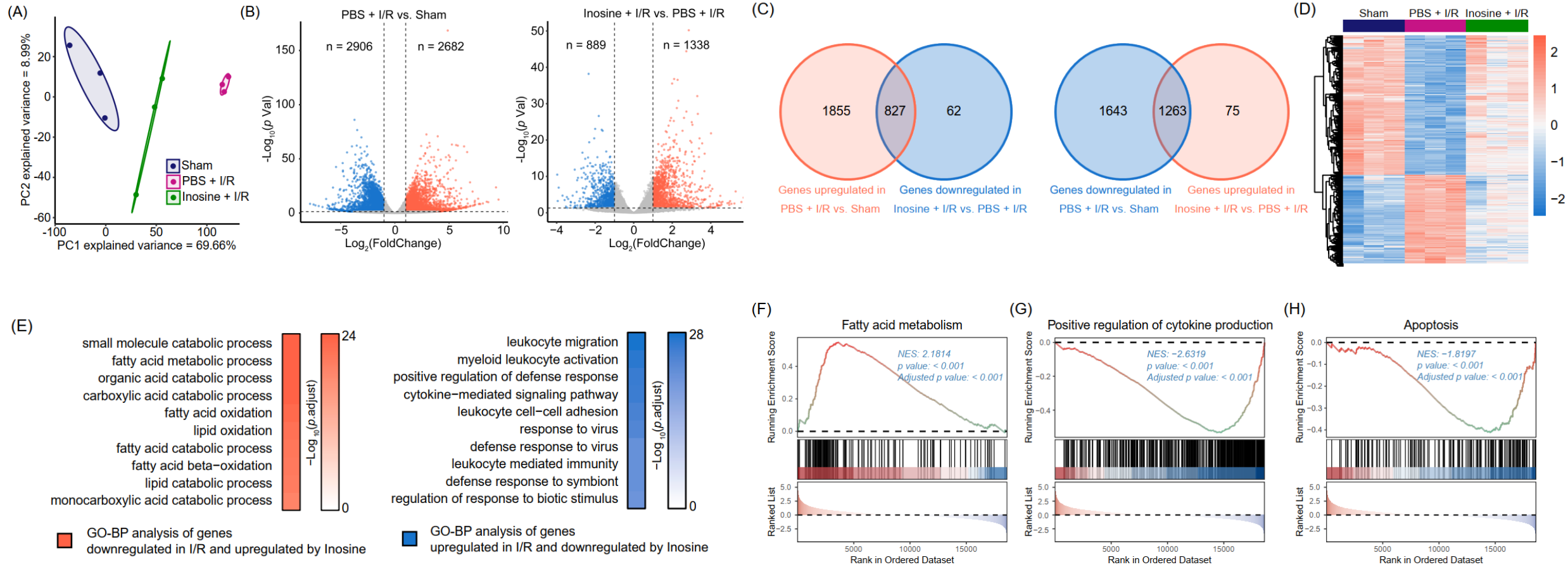


Figure 4. Transcriptional analysis revealing the improved energy metabolism and suppressed immune response in mouse hearts subjected to I/R surgery and inosine treatment.

# Results

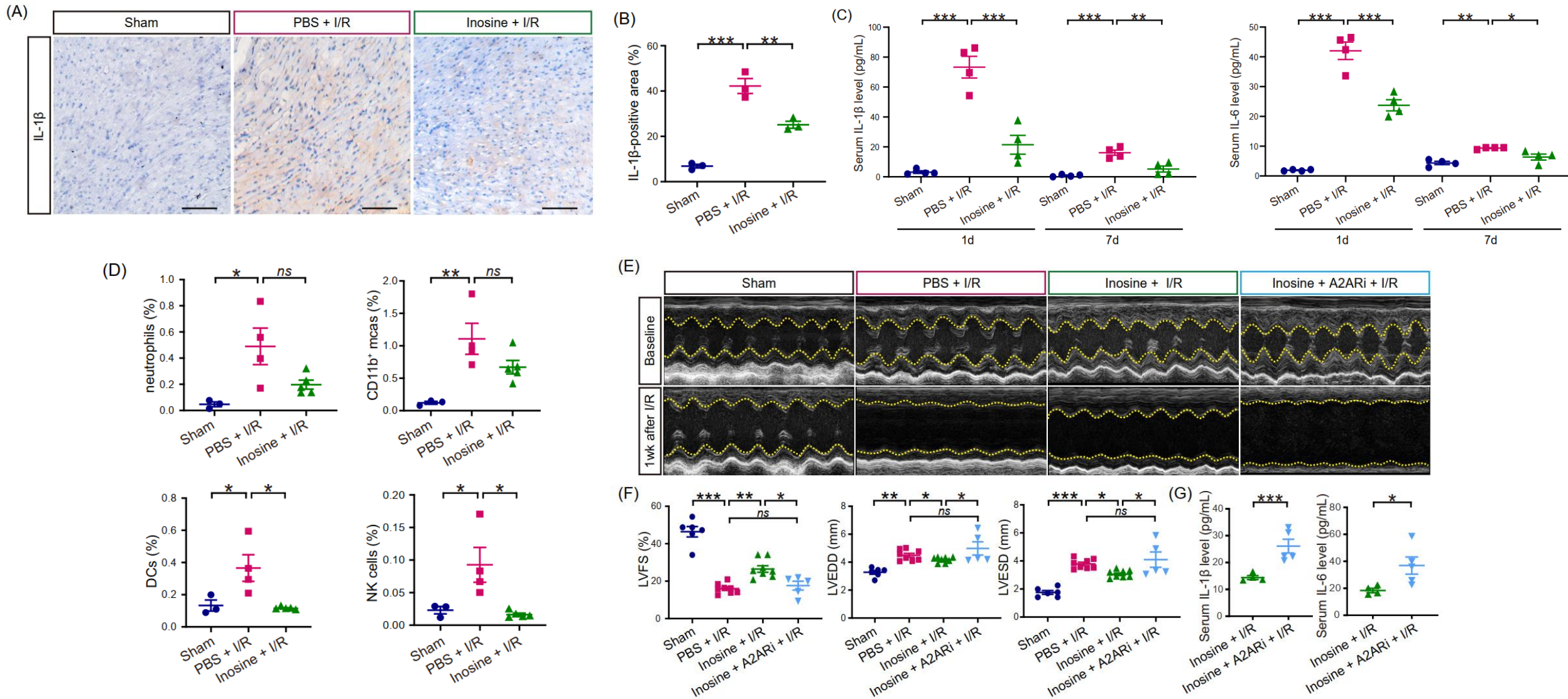


Figure 5. Inosine reduced cardiac inflammation after I/R via the activation of the anti-inflammatory A(2A) receptor.

# Results

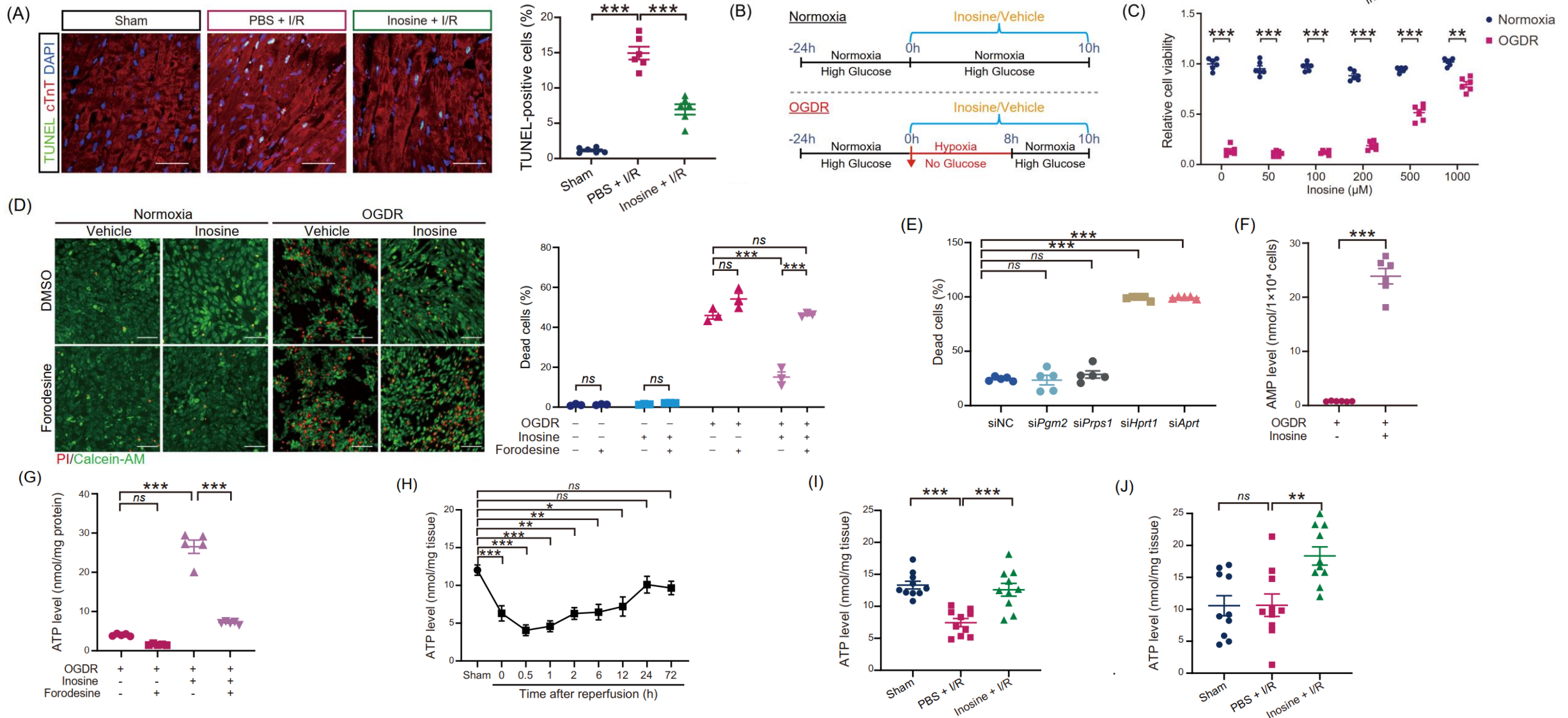


Figure 6. Inosine attenuated cardiac cell death by serving as an alternative carbon source for ATP generation through the purine salvage pathway.



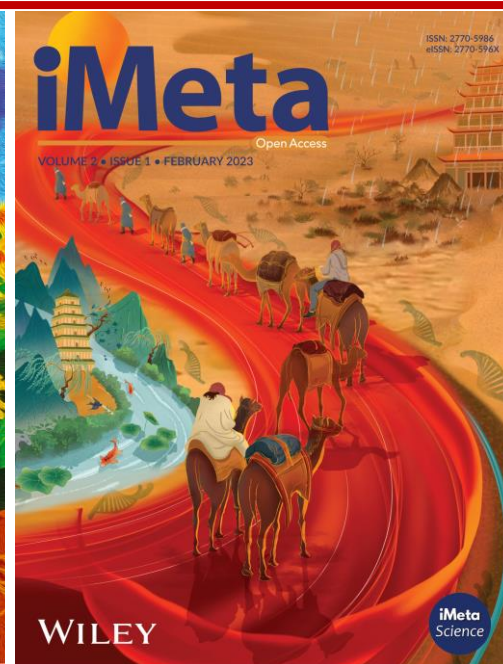
# Summary

- ❑ 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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