Does nature provide the clues for future heart failure treatments?

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Heart failure results in significant morbidity and mortality. Some developments that have advanced the field include better medications for symptom control, pharmacologic inotropic support, and mechanical devices for those with end-stage congestive heart failure. However, better disease understanding and treatments are still needed.

In their article, “Right ventricular involution: What can we learn from nature’s model of compensated hypertrophy?” Bowen and colleagues¹ examine the process of right ventricular involution. By studying mice right after birth, they describe some of the shifts that occur at the cellular and molecular level as the right ventricle shifts from a high-pressure chamber in fetal life to a low-pressure chamber after birth. They demonstrate differences in ventricular thickness and apoptosis. In particular, at the transcriptome level, there is increased expression of proapoptotic genes in the initial stages.

Apoptosis inhibitors are currently being studied for other diseases, such as in cancers and neurologic disorders. Other transcriptome changes have been implicated in those with cardiomyopathy.² As well, recent literature demonstrates that the epigenome may play a role.³ Given recent advances in cellular modeling with induced pluripotent

stem cell technology, it is foreseeable that the molecular understanding of heart failure will continue to grow. The insights gained from such studies can help direct research and drug development in the future.

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Central Message

The molecular process of right ventricular involution may help provide drug targets for future heart failure treatments.

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