

## PUBLICATION DETAILS JANUARY 2026 – MARCH 2026



**Name of the faculty:** Dr. N. Dhatchana Moorthy

**Journal Article:** Expression and Regulation of *Npr1* Gene Coding for Natriuretic Peptide Receptor-A in Hypertrophied Heart: Mechanisms and Therapeutic Implications

**Author's name:** Elangovan Vellaichamy, Gopinath Nagaraj, Tharshini Elangovan, Dhatchana Moorthy Nachiappan, Suresh Dhanusu & Jayashree Bheeman

**Abstract:**

### **Background**

The *Npr1* gene (Chromosome 1q21–q22) encodes natriuretic peptide receptor-A/ Guanylyl cyclase A/ (NPR-A/GC-A), a membrane-bound receptor protein. This protein acts as a primary receptor for cardiac-derived peptide hormones atrial natriuretic peptide (ANP) and brain natriuretic peptide (BNP), and exert physiological functions such as blood pressure and blood volume control. Recent studies have provided valuable insights that *Npr1* gene is not only controls blood pressure but also plays a key role in cardiac hypertrophic growth and remodeling, and heart failure.

### **Objective**

Understanding the expression and regulation of *Npr1* in normal and diseased hearts may lead to improved strategies for enhancing the anti-hypertrophic activities of natriuretic peptides. This review discusses the current knowledge on the expression and regulation of *Npr1* and its receptor activity in normal and hypertrophied hearts, both in vitro and in vivo.

### **Methods**

*Npr1* gene targeted mouse models and in vitro cell culture systems.

### **Results**

Studies using gene-targeted and transgenic mouse models have shown that the *Npr1* gene is present in the heart as an intrinsic anti-hypertrophic protective gene that opposes abnormal cardiac remodeling. A mutation in *Npr1* gene is associated with hypertrophic growth in humans. Moreover, *Npr1* gene expression and its function are reportedly suppressed in the diseased hearts as compared with the control heart. However, the reason behind the reduced expression and impaired responsiveness of this receptor during hypertrophic growth and remodeling remains unclear.

### **Conclusions**

This study provides information on new strategies to modulate *Npr1* gene expression levels in the heart, which may serve as a potential therapeutic strategy for managing left ventricular hypertrophic growth and heart failure in patients.

**Journal name:** International Journal of Peptide Research and Therapeutics

**Article URL:** <https://link.springer.com/article/10.1007/s10989-026-10806-6>