

# Gene therapy for refractory angina and cell therapy for heart failure: experience of a Brazilian research group

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## Abstract

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Cell therapy has shown impressive effects in experimental cardiomyopathy models. To a lesser extent, gene therapy has also been studied. In both cases, translation to clinical therapy has been disappointing. This paper is intended to describe the experience and achievements of a multicenter working group located in Porto Alegre, southern Brazil, in experimental and translational research projects for cell-based and gene therapy methods in the treatment of dilated and ischemic cardiomyopathies. The results of preclinical and clinical studies showed that bone marrow mononuclear stem cells indeed have an effect in improving myocardial perfusion and contractile function, but the overall results are poorly translated to the clinical level. Gene therapy studies with direct myocardial

injections of naked VEGF 165 plasmid showed improvement in myocardial perfusion and function in animal models. A randomized clinical trial found that this method is safe and improved myocardial perfusion, but the benefits disappeared after 1 year. An animal experiment associating VEGF 165 with angiopoietin was undertaken in mini pigs to extend the durability of that therapy. In conclusion, our efforts to better understand the mechanisms and functions of gene and cell-based therapies in cardiology resulted in significant findings and propose a future look at cell-free therapeutic approaches.

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### **Conflict of interest**

The authors declare that they have no conflict of interest.

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## **Supplementary information**

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