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## **Molecular and environmental cues in cardiac differentiation of mesenchymal stem cells**

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### **Citation**

Ramkisoensing, A. A. (2014, May 7). *Molecular and environmental cues in cardiac differentiation of mesenchymal stem cells*. Retrieved from <https://hdl.handle.net/1887/25711>

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**Issue Date:** 2014-05-07

# STELLINGEN BEHOREND BIJ HET PROEFSCHRIFT

## **“MOLECULAR AND ENVIRONMENTAL CUES IN CARDIAC DIFFERENTIATION OF MESENCHYMAL STEM CELLS”**

1. Human mesenchymal stem cells of embryonic stem cell or fetal but not adult origin can differentiate into three cardiac lineages: cardiomyocytes, endothelial cells and smooth muscle cells. (this thesis)
2. Efficient gap junctional coupling with adjacent cardiomyocytes is essential to induce cardiomyogenic differentiation of naturally Cx43-rich fetal human mesenchymal stem cells in co-culture with neonatal rat cardiomyocytes. (this thesis)
3. Differentiation experiments involving the use of viral vector-marked donor cells should be interpreted with caution. (this thesis)
4. By controlling mesenchymal stem cells engraftment rate and patterns the critical balance between therapeutic potential and hazardous risk of mesenchymal stem cells therapy for cardiac diseases may be tipped in the right direction. (this thesis)
5. Intracardiac cell grafting might provide a useful approach for myocardial repair, provided that the grafted cells can contribute to myocardial function. (Adapted from Soonpaa M.H. et al. Science. 1994;264:98-101)
6. More than three decades have passed since the original formulation of the concept, revolutionary at the time, that multiple connective tissues could emanate from a common progenitor or stem cell retained in the postnatal bone marrow. (Bianco P. et al. Nat Med. 2013;19:35-42)
7. Cultured beating heart cells have provided us with a unique physical measurement of specific cell function. (Adapted from Harary I. and Farley B. Exp Cell Res. 1963;29:451-465)
8. We must do our best to protect patients, and we must proceed carefully, but we cannot withhold from society the potentially revolutionary benefits of regenerative therapeutics. (Smith R.R. et al. Heart Rhythm. 2008;5:880-887)
9. Basic science is not a game of truth or dare, but rather a game of truth and dare.
10. A safe definition of a stem cell derived cardiomyocyte is a cardiomyocyte-like cell.
11. In het weekend werken tijdens je promotie wordt begrijpelijker voor anderen als je uitlegt dat cellen beestjes zijn die ook in het weekend moeten eten.
12. In law: Innocent until proven guilty. In science: False until significantly proven true.