

High mobility stem cells and cardiomyopathies

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Dystrophin-associated proteins, including sarcoglycans, are critical for both cardiac and skeletal muscle function, probably exerting their roles by different molecular mechanisms (Heydemann A et al. 2001). We recently showed that cardiac mesoangioblasts (cMabs), derived from beta-sarcoglycan (beta-SG) null hearts, strongly differentiated towards a skeletal muscle phenotype forming large myotubes (Crippa et al. 2010). Time-lapse movies of beta-SG GFP-cMabs evidenced the presence of cell subpopulations characterized by high mobility and incapability to fuse. To isolate these cells, we have subcloned cMabs after 2 rounds of serum starvation. We obtained 5 GFP clones (#7, 11, 17, 53 and 56). By magnetic beads immunoselection we could separate CD44-cKit positive cells from clones. CD44 is a key regulator of myoblast migration (Milona E et al. 2006). Then we tested myogenic differentiation potential of the clones eventually co-cultured with unlabeled cMabs. Myosin immunofluorescence analysis showed that all the clones did not form myotubes. Moreover, 2 of them (#7, #17) seemed to improve myogenic potential of unlabeled cMabs. We obtained similar results with C2C12 myoblast cells. We have also analysed the cells for expression of stem cell markers. Interestingly, some subclones expressed the neural stem cell markers Sox2 and Sox 17.

In summary, we identified a novel cell population able to improve myogenic differentiation and potentially able to adopt a neural fate under appropriate culture conditions. Moreover, a recent paper (Stefanovic S et al. 2009) suggests a role for both Sox2 and Sox 17 in early cardiac differentiation. Thus we are planning to test our clones for cardiac differentiation capability *in vitro* and *in vivo*.

References

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