



University of
Zurich^{UZH}

Institute for Regenerative
Medicine (IREM)



Colloquium

Clinical Colloquium Regenerative Medicine

**Monday, Nov 30 2020 at 1–2pm,
Institute for Regenerative Medicine (IREM)**

Zoom-meeting:

<https://uzh.zoom.us/j/91952820778?pwd=Yk9DTVZGbUdyY25VQVVwUVBkQ20wQT09>

PD Dr. Anna Marsano

Department of Biomedicine and Department of Surgery, Univ. Hospital Basel

Engineered patches for the treatment of chronic cardiac ischemia

Cardiovascular disease and chronic myocardial ischemia cause progressive deterioration of cardiac function and lead to irreversible, end-stage heart failure. However, the restoration of the microcirculation, as well as the additional treatment with cardioprotective factors in the hypo-perfused myocardial areas, could preserve cardiomyocyte survival and contraction, therefore improving the overall cardiac function.

Human adipose tissue-derived Stromal vascular Fraction (SVF) cells are a heterogeneous cell population well known to release factors promoting cell survival and myocardial repair (e.g. insulin growth factor-1). Moreover, SVF cells have a high angiogenic potential thanks to the presence of numerous endothelial and mural progenitors, beside the mesenchymal stem cell population. SVF cell-based therapies showed promising results on the treatment of myocardial infarction. However, before the successful translation into a clinical application, some limitations still need to be overcome, such as the cell low in vivo engraftment and the SVF variability in the cell composition from different donors. The use of three dimensional (3D) SVF cell-based patches could provide a tighter control over the adjuvant angiogenic and repair therapy, reducing undesired systemic effects, while enhancing implanted cell survival, compared to intramyocardial cellular injections.

We recently demonstrated that the in vitro organization of SVF-cells in 3D collagen scaffolds reached after a perfusion-based culture further enhances the in vivo angiogenic potential, as well as the control over the different SVF subpopulations, compared to statically generated constructs.

This lecture will present the latest data on the 3D SVF-patches, in particular their potentials to induce in vivo angiogenesis in both ectopic and orthotopic animal models, as well as their effects on cardiac maturation and survival in in vitro cardiac models.

Organiser: Prof. Dr. Dr. Simon P. Hoerstrup / Prof. Dr. Roger M. Nitsch

Execution/Chair: Dr. Steffen M. Zeisberger / Dr. Christian Tackenberg

IREM, University of Zurich

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