

Gene-expression profiles represent a powerful tool to identify and evaluate relevant targets for drug development strategies. However, the analysis of profiles generated from primary tissue is often difficult and not comprehensive because tissue preparations do not represent SINGLE cell types. In contrast to primary tissue in which cardiomyocytes represent only a proportion of 30-40% of total cells, the RNA from the Cor.At cells provides an ultimately pure and comprehensive source for gene expression analysis.

Cor.At® RNA is isolated from cultures of different developmental stages. We demonstrated that maturation occurs in vitro within a 2 week period. This fact enables researches to compare gene-expression profiles of a "new-born" phenotype versus an "adult" phenotype.

Gene expression analysis in a longitudinal study

To gain greater insight into the molecular characteristics of mouse ESC-derived cardiomyocytes, a detailed gene expression analysis was performed. To this end, RNA was prepared on daily basis for 36 consecutive days at different stages starting from cultures of undifferentiated ESCs

, post embryonic body formation, early stages of the differentiation process, cardiomyocyte

development stage, the selection period with puromycin

and from prolonged culture of monolayers

of pure cardiomyocytes

. Real-time PCR

was performed with RNA samples collected from all conditions. Based on the gene expression data, the

transgenic

ESC-derived

cardiomyocytes

express all tested

cardiomyocyte

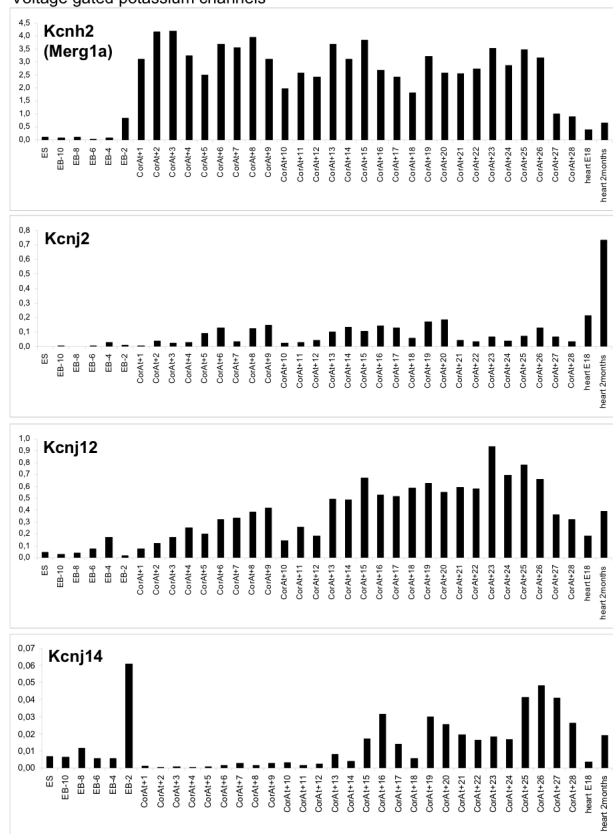
marker genes, ion channels, and connexins

involved in the formation of gap junctions to allow synchronized contraction of cardiomyocytes

An example is depicted below

Ion Channels (part 3)

Voltage gated potassium channels



CorAt gene expression profiling. Expression of ion channels was quantified by qRT-PCR on a LightCycler 480 II. Relative quantification of gene expression is depicted as delta Cp [$\Delta Cp = 2^{-(Cp - Cp_{\text{ref}})}$]. The mean Cp of five housekeeper genes (Arbp, Rpl13a, Gusb, G6pdx, Crebbp, Arfp1) was used as reference.