

Publication

A cassette system to study embryonic stem cell differentiation by inducible RNA interference

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 153462**Author(s)** Wegmüller, Daniel; Raineri, Ines; Gross, Brigitte; Oakeley, Edward J; Moroni, Christoph**Author(s) at UniBasel** [Moroni, Christoph](#) ;**Year** 2007**Title** A cassette system to study embryonic stem cell differentiation by inducible RNA interference**Journal** Stem Cells**Volume** 25**Number** 5**Pages / Article-Number** 1178-85**Keywords** embryonic stem cells, cardiac development, RNA interference, tetracycline, Zfp36L1, mRNA turnover

Although differentiation of pluripotent embryonic stem cells is restricted by a hierarchy of transcription factors, little is known about whether post-transcriptional mechanisms similarly regulate early embryoid differentiation. We developed a system where small hairpin (sh)RNAs can be induced in embryonic stem (ES) cells from a defined locus following integration by Flp recombinase-mediated DNA recombination. To verify the system, the key transcription factor Stat3, which maintains pluripotency, was downregulated by shRNA, and the expected morphological and biochemical markers of differentiation were observed. Induction of shRNA specific for the post-transcriptional regulator Brf1 (Zfp36L1) amplified the cardiac markers with strong stimulation of cardiomyocyte formation within embryoid bodies. These findings identify Brf1 as a novel potential regulator of cardiomyocyte formation and suggest that post-transcriptional mechanisms are of importance to early development and, possibly, to regenerative medicine. The inducible RNA interference system presented here should also allow assignment of function for candidate genes with suspected roles in ES cell development. Disclosure of potential conflicts of interest is found at the end of this article.

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