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Seminars in Genetics and Molecular Cell Biology

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Direct reprogramming of cell fates in *C. elegans*

Direct reprogramming of cells into specific somatic cell types such as neurons or muscles offer a promising perspective to generate tissues for cellular replacement therapies in order to treat degenerative diseases and injuries. Direct cell fate conversion is an alternative strategy to the procedure of generating induced pluripotent stem cells and re-differentiating them by forced expression of specific Transcription Factors (TFs). However, TFs that have fate-inducing capabilities, such as terminal selector genes that establish a specific neuronal identity or other selector TFs such as the myogenic TF MyoD, have limited ability in directly reprogramming cell fates. Upon mis-expression they can reprogram only a few other cell types that are in a certain context.

We have described recently the identification of LIN-53 (RBBP4/7 in vertebrates) as an inhibitor of germ cell reprogramming in *C. elegans*. In *lin-53* deficient worms, germ cells can be converted into somatic cells with morphological and molecular characteristics of specific neurons or muscle cells. LIN-53 is shared by several chromatin regulatory complexes such as the NURF/NuRD chromatin remodeling or the Polycomb Repressive Complex but the exact role of LIN-53 in protecting germ cells towards somatic reprogramming remains unclear. Furthermore, reverse and forward genetics screens yielded mutants displaying phenotypes of somatic tissue reprogramming and are currently being characterized.

Since our preliminary results indicate that the age of the worm has an impact on the efficiency of reprogramming cell fates, we are also interested in assessing to which extend and how the age of a cell and its amenability to be reprogrammed are coupled.

Friday, September 28, 2012 at 4.30 p.m.

Institute for Genetics,
Zülpicher Str. 47 a, Lecture hall, ground floor

Host: Thorsten Hoppe, Institute for Genetics,
University of Cologne

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