Institut NeuroMyoGène

Lyon 1 Inserm cnrs

Seminar

Tuesday November 22th 14.00

Amphithéâtre de la délégation du CNRS
Domaine Universitaire de la DOUA, 2 Rue Albert Einstein, Villeurbanne
(http://oscar.univ-lyon1.fr/appli-externe/plan/plans/plan_campus_ouest.html)

F. Jeffrey Dilworth

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" Epigenetic control of stem cell fate decisions in muscle repair"

Abstract

During muscle regeneration, the conversion of muscle stem cells to terminally differentiated myofibers requires multiple cell fate transitions. Each of these transitions necessitates an alteration in the set of genes being expressed within the cell. In this presentation, our studies on the role of transcription factors and epigenetic enzymes in dictating changes in muscle gene expression will be highlighted. In particular, I will focus on the role for the antagonism between various transcription factors and epigenetic enzymes in controlling the commitment of muscle stem cells towards alternate cell fates.

If you wish to meet Jeff Dillworth, please contact Bénédicte Chazaud (benedicte.chazaud@inserm.fr).

Institut NeuroMyoGène

Selected recent publications:

H. Faralli, C. Wang, A. Benyoucef, S. Sebastian, L. Zhuang, A. Chu, C. Palii, C. Liu, B. Camellato, M. Brand, K. Ge, and F.J. Dilworth. H3K27-demethylase activity of UTX/KDM6A is essential for skeletal muscle regeneration. **Journal of Clinical Investigation** 126: 1555-1565, 2016.

A. Benyoucef, C.G. Palii, C.Wang, C.J. Porter, A. Chu, F. Dai, V. Tremblay, P. Rakopoulos, K. Singh, S. Huang, F. Pflumio, J. Hébert, J.F. Couture, T.J. Perkins, K. Ge, F.J. Dilworth, & M. Brand. UTX inhibition as selective epigenetic therapy against TAL1-driven T cell acute lymphoblastic leukemia. **Genes & Dev** 30: 508-521, 2016.

Y. Li, and F.J. Dilworth. Compacting chromatin to ensure muscle satellite cell quiescence. **Cell Stem Cell** 18: 162-164, 2016.

K.K. Nakka, N. Chaudhary, S. Joshi, J. Bhat, K. Singh, S. Chatterjee, R. Malhotra, A. De, M.K. Santra, F.J. Dilworth, and Samit Chattopadhyay. Nuclear matrix-associated protein SMAR1 regulates alternative splicing via HDAC6-mediated deacetylation of Sam68. **Proc Natl Acad Sci USA** 112 : E3374-3383, 2015.

K. Singh, M. Cassano, E. Planet, S.Sebastian, S.M. Jang, G. Sohi, J. Choi, H.D. Youn, F.J. Dilworth*, and D. Trono*. KAP1 functions as a phosphorylation-inducible activator of MyoD function during skeletal muscle differentiation. **Genes & Dev** 29: 513-525, 2015.

S. Sebastian, H. Faralli, Z. Yao, P. Rakopoulos, C. Palii, Y. Cao, K. Singh, Q-C. Liu, A. Chu, A. Aziz, M. Brand, S.J. Tapscott, and F.J. Dilworth. Tissue-specific splicing of a ubiquitously expressed transcription factor is essential for muscle differentiation. **Genes & Dev** 27: 1247-1259, 2013.

Q-C. Liu, X. Zha, H. Faralli, H. Yin, C. Louis-Jeune, E. Perdiguero, E. Pranckeviciene, P. Munoz-Canoves, M. Rudnicki, M. Brand, C. Perez-Iratxeta, and F.J. Dilworth. Comparative expression profiling identifies differential roles for Myogenin and p38a MAPK signaling in myogenesis. **J Mol Cell Biol.** 4: 386-397, 2012.

A. Aziz, Qi-Cai Liu, and F.J. Dilworth. Regulating a master regulator: establishing the tissue-specific gene expression program in skeletal muscle. **Epigenetics** 5: 692-696, 2010.

S. Seenundun, S. Rampalli, Q-C. Liu, A. Aziz, C. Palii, S.H. Hong, A. Blais, M. Brand, K. Ge, and F.J. Dilworth. UTX-mediated demethylation of H3K27me3 at muscle-specifc genes during myogenesis. **EMBO Journal** 29: 1401-1411, 2010.

C-P. Chaturverdi, A. Hosey, C. Palii, C. Perez-Iratxeta, Y. Nakatani, J.A. Ranish, F.J. Dilworth, and M. Brand. Dual role for the methyltransferase G9a in maintenance of b-globin gene transcription in adult erythroid cells. **Proc Natl Acad Sci USA** 106: 18303-18308, 2009.

M. Brand, S. Rampalli, C-P. Chaturverdi, and F.J. Dilworth. Analysis of epigenetic modifications of chromatin at specific gene loci by native chromatin immunoprecipitation (N-ChIP) of nucleosomes isolated using hydroxyapatite chromatography. **Nature Protocols** 3: 398-409, 2008.

S. Rampalli, L. Li, E. Mak, K. Ge, M. Brand, S.J. Tapscott, and F.J. Dilworth. p38 MAPK signaling pathway regulates recruitment of Ash2L-containing methyltransferase complexes to specific genes during differentiation. **Nature Structural and Molecular Biology** 14: 1150-1156, 2007.