Hippo pathway downstream effectors Yap and Taz play key roles in cell proliferation and regeneration, regulating gene expression especially via Tead transcription factors. To investigate their role in skeletal muscle stem cells, we analysed Taz in vivo and ex vivo in comparison to Yap. siRNA knockdown or retroviral-mediated expression of wildtype human or constitutively active TAZ mutants in satellite cells showed that TAZ promoted proliferation, a function shared with YAP. However, at later stages of myogenesis, TAZ also enhanced myogenic differentiation of myoblasts, whereas YAP inhibits such differentiation. Functionally, while muscle growth was mildly affected in Taz (gene Wwtr1(-/-)) knockout mice, there were no overt effects on regeneration. Conversely, conditional knockout of Yap in satellite cells of Pax7(Cre-ERT2/+) : Yap(fl) *(x/fl) *(x:): Rosa26(Lacz) mice produced a marked regeneration deficit. To identify potential mechanisms, microarray analysis showed
many common TAZ/YAP target genes, but TAZ also regulates some genes independently of
YAP, including myogenic genes such as Pax7, Myf5 and Myod1 (ArrayExpress -
E-MTAB-5395). Proteomic analysis revealed many novel binding partners of TAZ/YAP in
myogenic cells, but TAZ also interacts with proteins distinct from YAP that are often involved in
myogenesis and aspects of cytoskeleton organization (ProteomeXchange - PXD005751).
Neither TAZ nor YAP bind members of the Wnt destruction complex but both regulated
expression of Wnt and Wnt-cross talking genes with known roles in myogenesis. Finally, TAZ
operates through Tead4 to enhance myogenic differentiation. In summary, Taz and Yap have
overlapping functions in promoting myoblast proliferation but Taz then switches to enhance
myogenic differentiation.

Stichworte: 
Hippo Pathway

Dewey Dezimalklassifikation neu: 
570 Biowissenschaften, Biologie; 610 Medizin und Gesundheit

Zeitschriftentitel: 
Stem Cells

Jahr: 
2017

Band: 
35

Jahr / Monat: 
2017-06

Monat: 
Jun

Heft / Issue: 
8

Seiten: 
1958–1972

Nachgewiesen in: 
Web of Science

Reviewed: 
ja

Sprache: 
en

Volltext / DOI: 
http://doi.org/10.1002/stem.2652

Pubmed: 

WWW: 

Verlag / Institution: 
Wiley

E-ISSN: 
1549-4918

Impact Factor: 
5.599

Semester (für SAP-Datenerfassung): 
SS 17

TUM Einrichtung: 
Sportbiologie
Occurences:

- Hochschulbibliographie > 2017 > Fakultäten > Sport- und Gesundheitswissenschaften > Lehrstuhl für Sportbiologie (Prof. Wackerhage)
- Einrichtungen > Fakultäten > Fakultät für Sport- und Gesundheitswissenschaften > Lehrstühle und Fachgebiete > Lehrstuhl für Sportbiologie (Prof. Wackerhage) > Wackerhage
- Einrichtungen > Fakultäten > Fakultät für Sport- und Gesundheitswissenschaften > Lehrstühle und Fachgebiete > Lehrstuhl für Sportbiologie (Prof. Wackerhage) > Publikationen 2017
- Einrichtungen > Fakultäten > Fakultät für Sport- und Gesundheitswissenschaften > Lehrstühle und Fachgebiete > Lehrstuhl für Sportbiologie (Prof. Wackerhage)

entries: