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## Does REDD1 act as an AMPK-like in skeletal muscle ?

Florian A. Britto<sup>1</sup>, Yassine Belloum<sup>1</sup>, Christelle Ramonatxo<sup>1</sup>, Elodie Jublanc<sup>1</sup>, Fabienne Cortade<sup>1</sup>, Béatrice Chabi<sup>1</sup>, Damien Freyssenet<sup>2</sup>, Sophie Giorgetti-Peraldi<sup>3</sup>, Vincent Ollendorff<sup>1</sup>, François B. Favier<sup>1</sup>

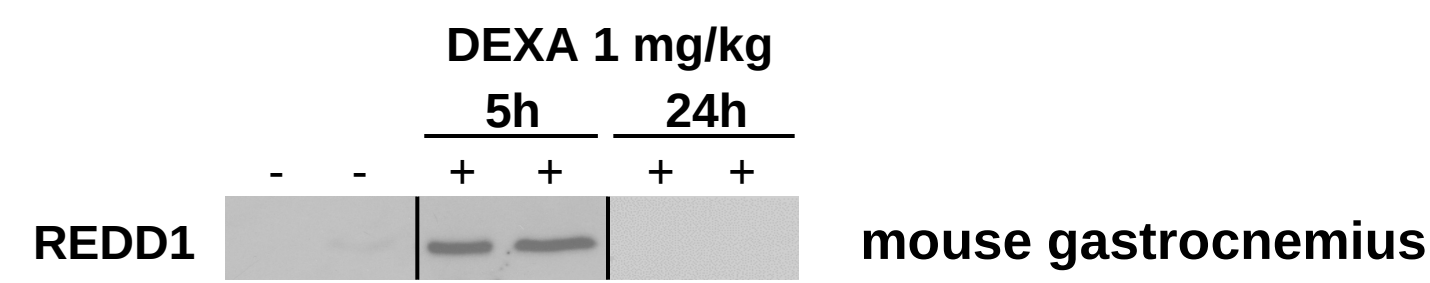
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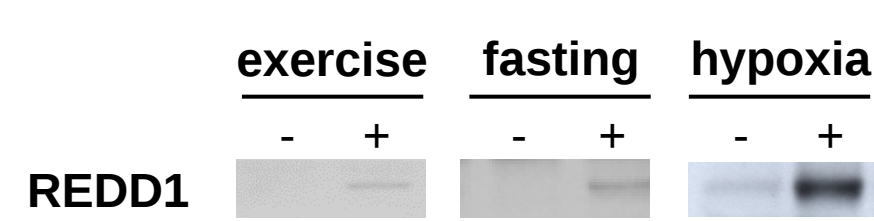
### REDD1 is a stress response protein

#### REDD1 induction by glucocorticoids

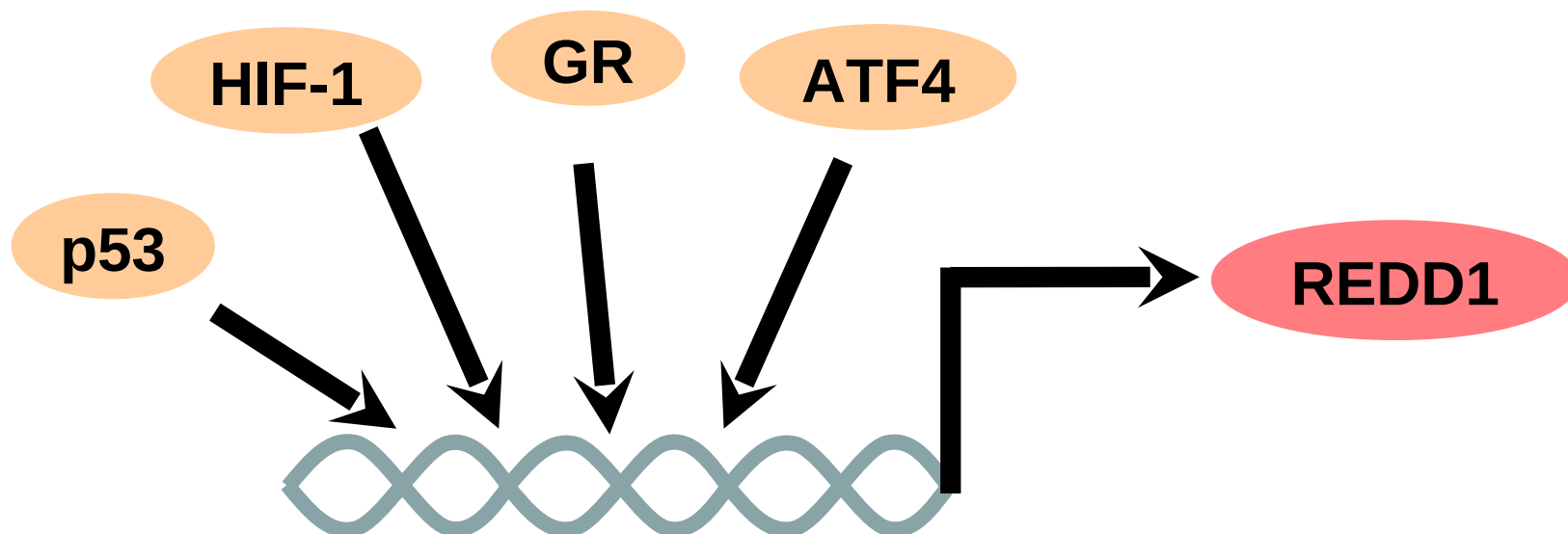


- Low basal expression
- Short half-life

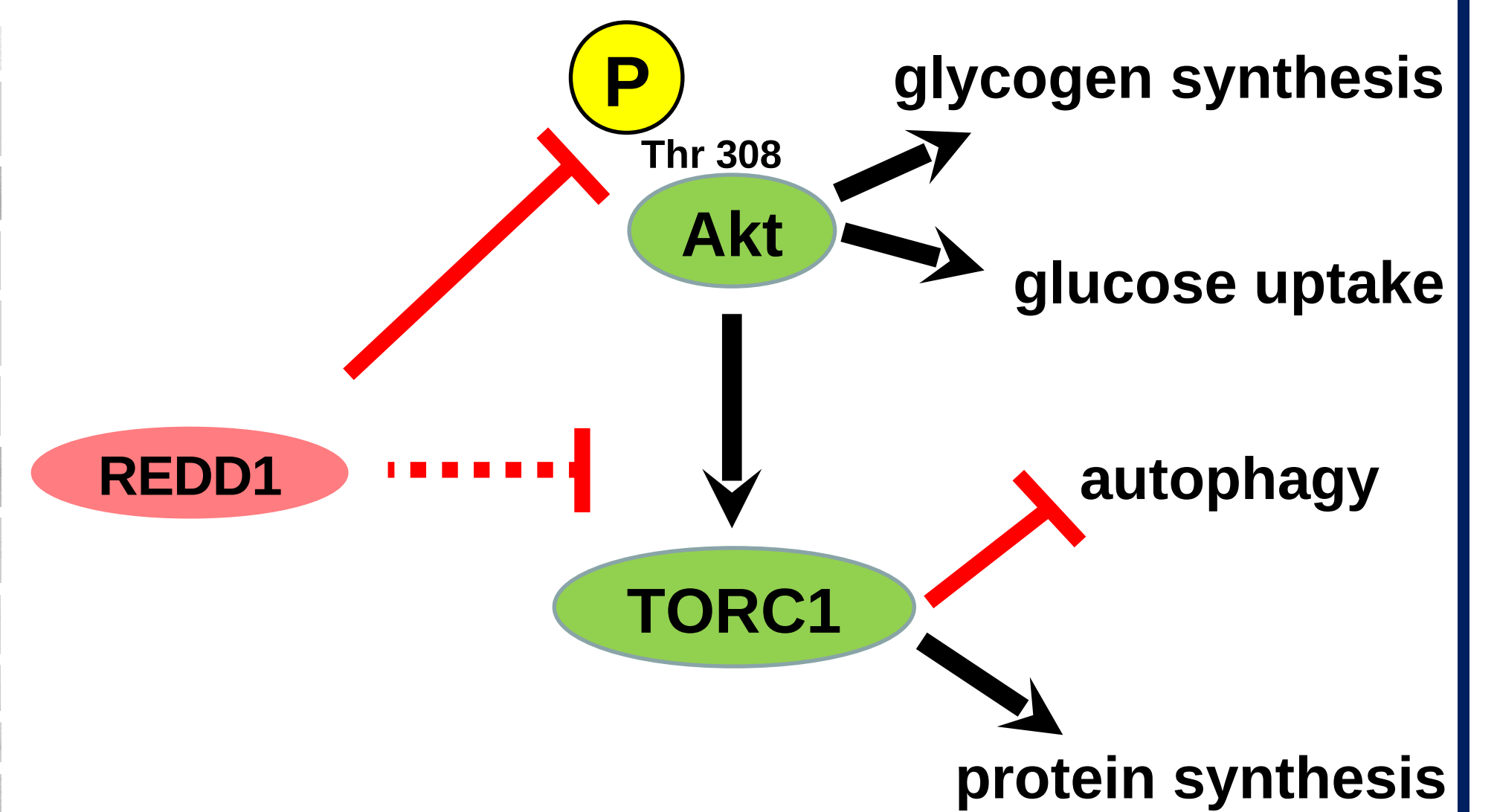
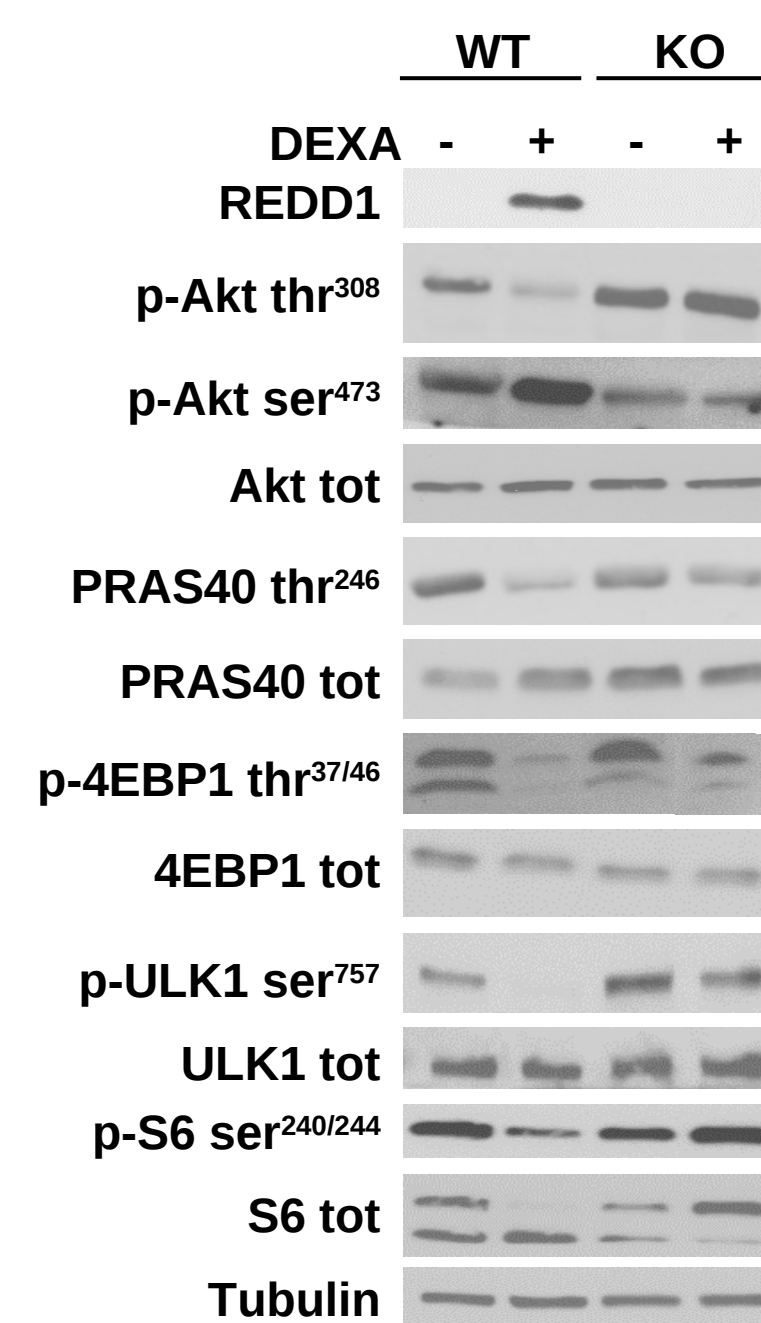
- 90-min running exercise (mouse gastrocnemius)
- 16-h fast (mouse gastrocnemius)
- 3 wk of hypobaric hypoxia (6,000 m, rat soleus)



- REDD1 induction in response to metabolic challenge



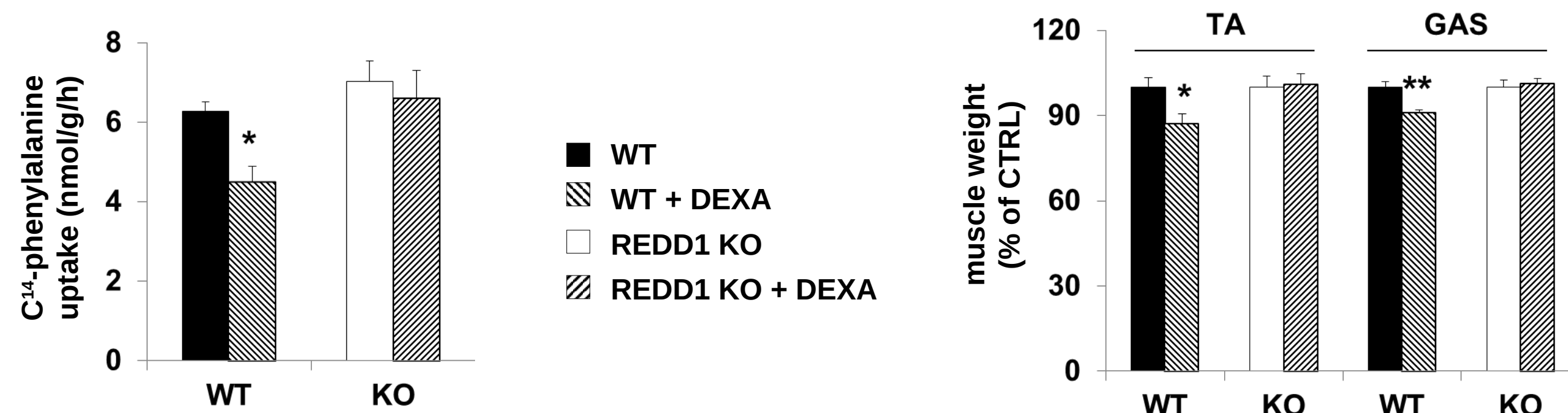
### REDD1 inhibits Akt/TORC1



- The deletion of REDD1 impedes the inhibition of the Akt/TORC1 pathway in response to dexamethasone (mouse gastrocnemius)

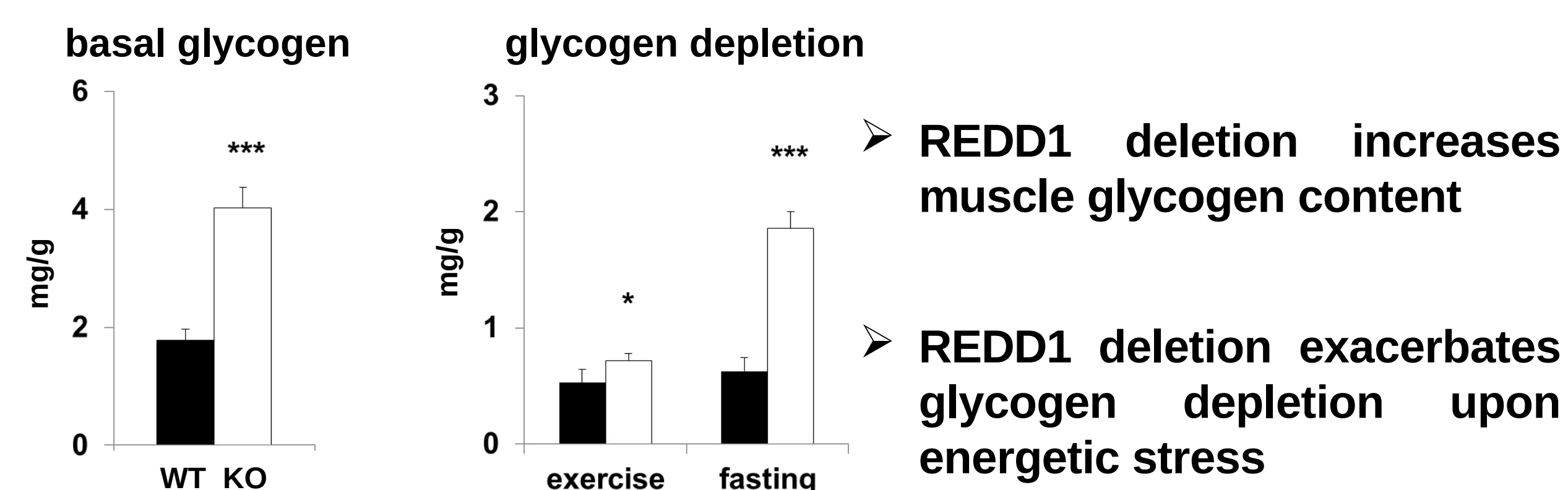
### REDD1 alters nutrients storage

#### Protein synthesis & muscle mass



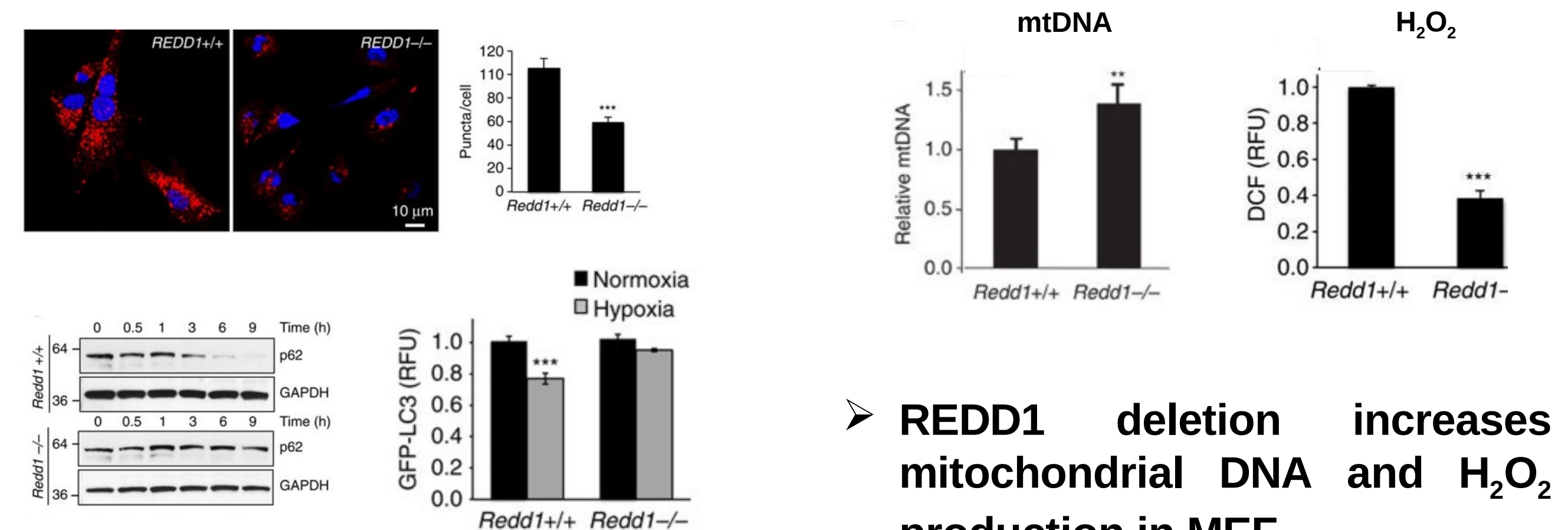
- REDD1 deletion abolishes the decrease in protein synthesis and in muscle mass after dexamethasone administration (mouse gastrocnemius)

#### Glycogen stores



- REDD1 deletion increases muscle glycogen content
- REDD1 deletion exacerbates glycogen depletion upon energetic stress

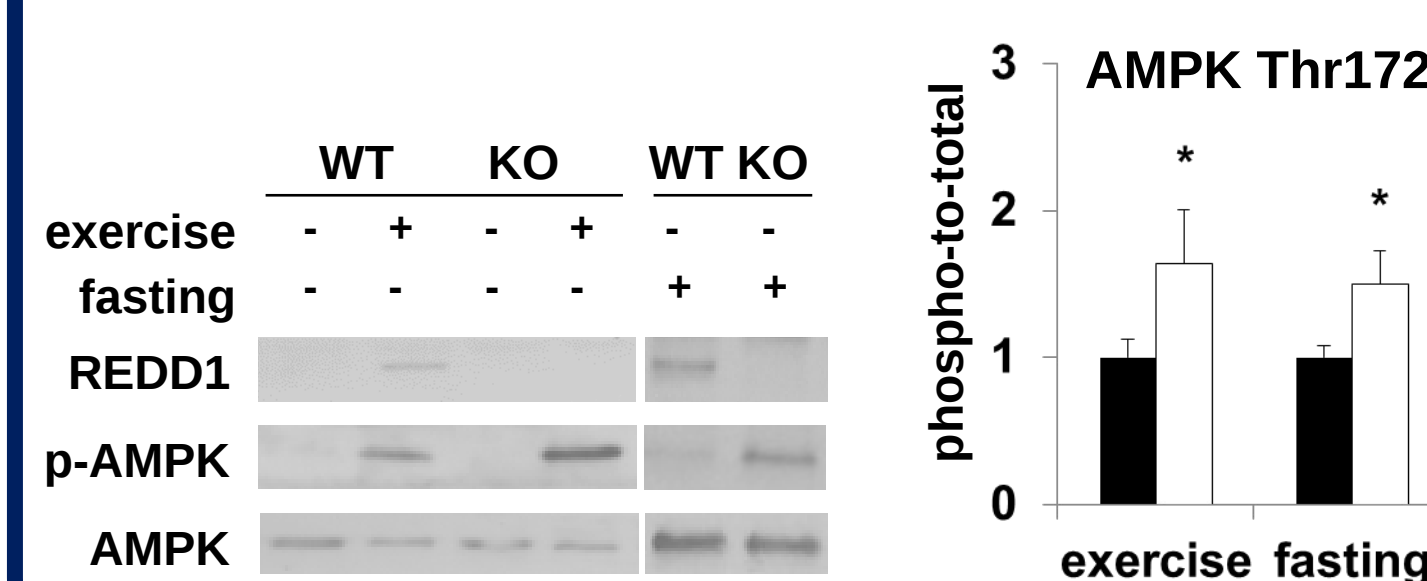
### REDD1 promotes mitophagy



- Basal and hypoxia-induced ATG are reduced in REDD1<sup>-/-</sup> MEF

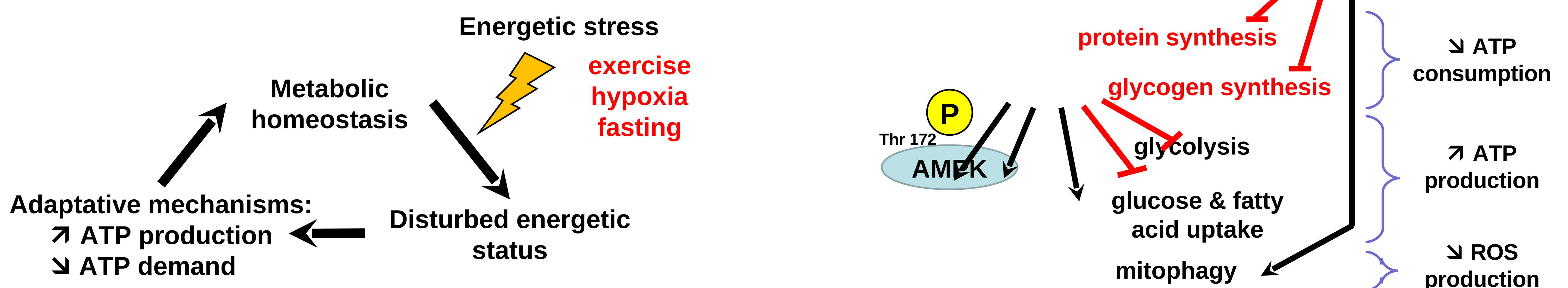
Qiao et al., 2015 Nat Commun

### AMPK activation is related to REDD1 upregulation



- AMPK activation is exacerbated in REDD1 KO mice upon energetic stress

### Conclusion



- By slowing down anabolic processes, REDD1 would spare ATP and delay AMPK activation

### References

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➤ Qiao et al., 2015 *Nat Commun.* 2015 Apr 28; 6: 7014.

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