Microtubule Acetylation in Anterior Pituitary Gonadotropes

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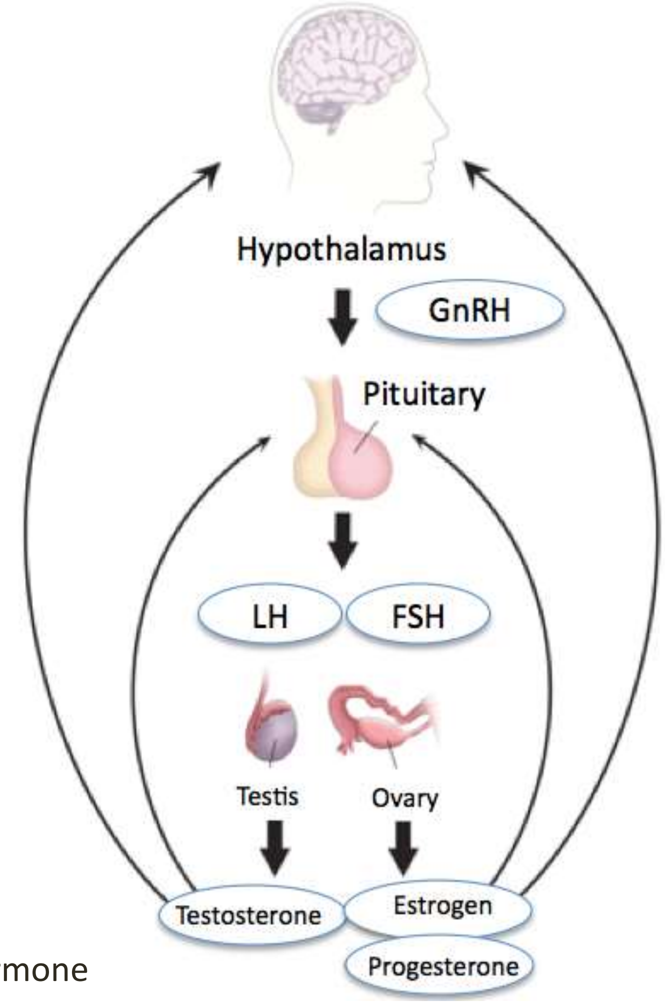
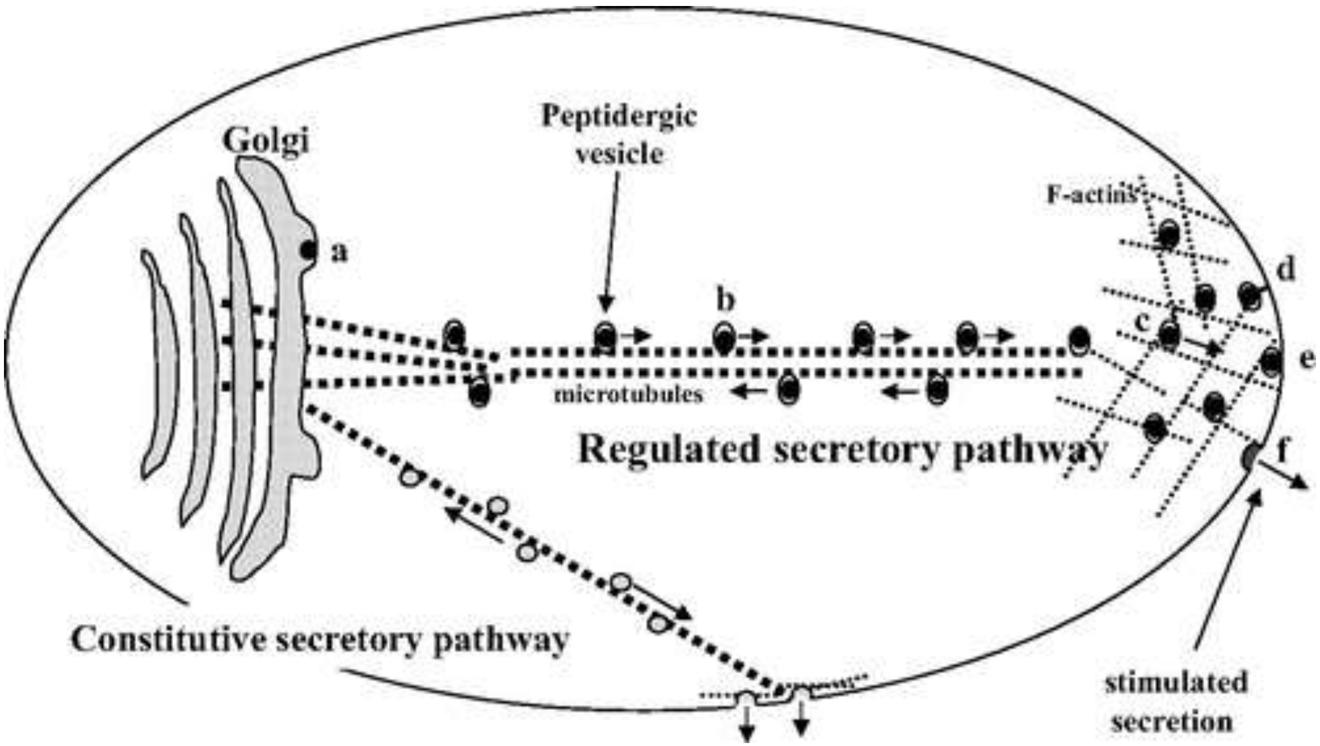
Hypothalamic Pituitary Gonadal (HPG) Axis



GnRH= gonadotropin releasing hormone
LH= luteinizing hormone
FSH= follicle stimulating hormone

(Koopman, 2013)

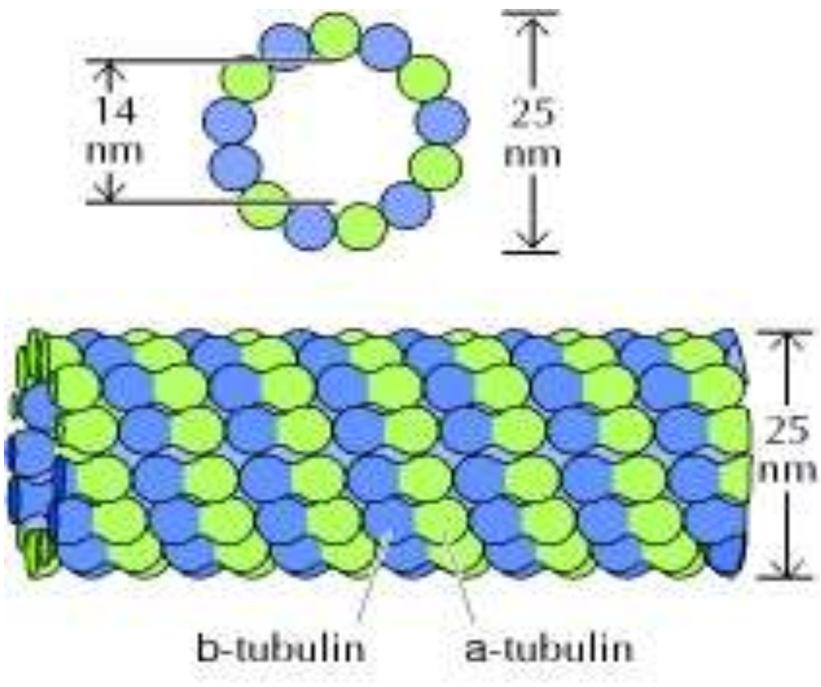
LH and FSH Release



(Park and Loh 2008)

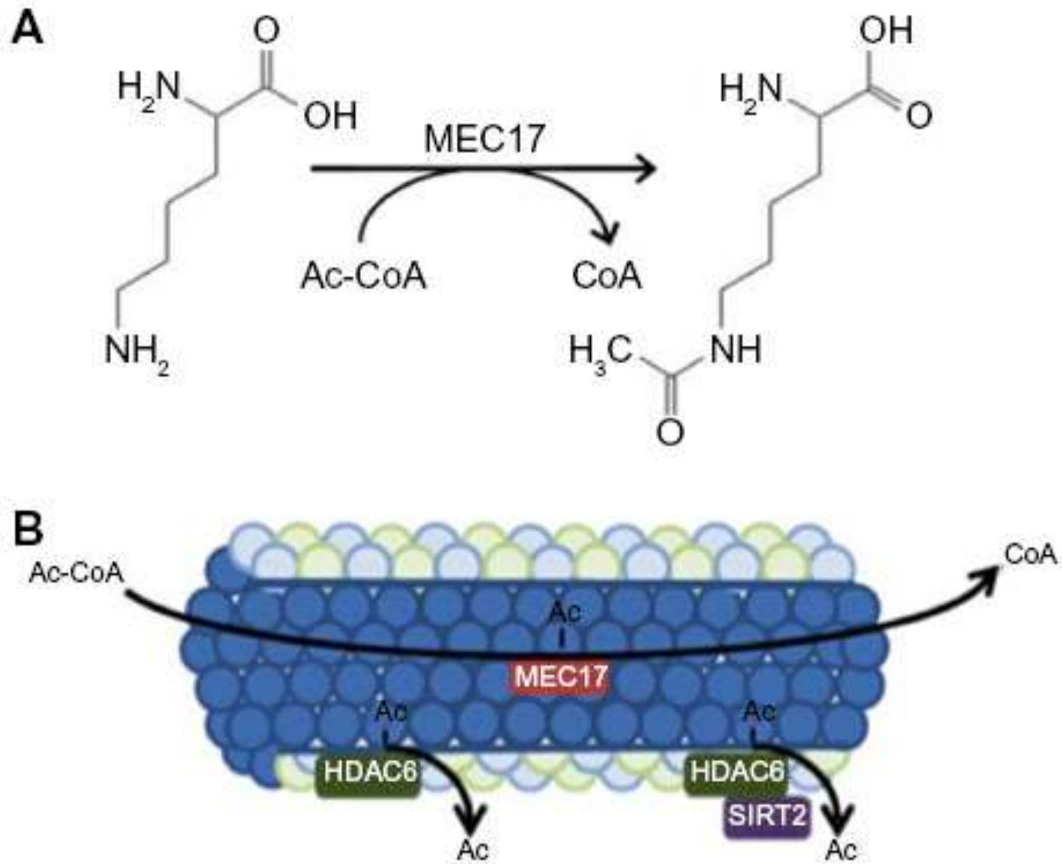
Microtubules

- Composed of globular α-tubulin and β-tubulin dimers
- Involved in many different important cellular processes
- Possess "dynamic stability"
- They can be modified post-translationally to effect their stability and organization,



(Cooper, 2000)

Acetylation of Microtubules



(Kelley and Rymut, 2015)

GnRH→ Acetylation of Tubulin

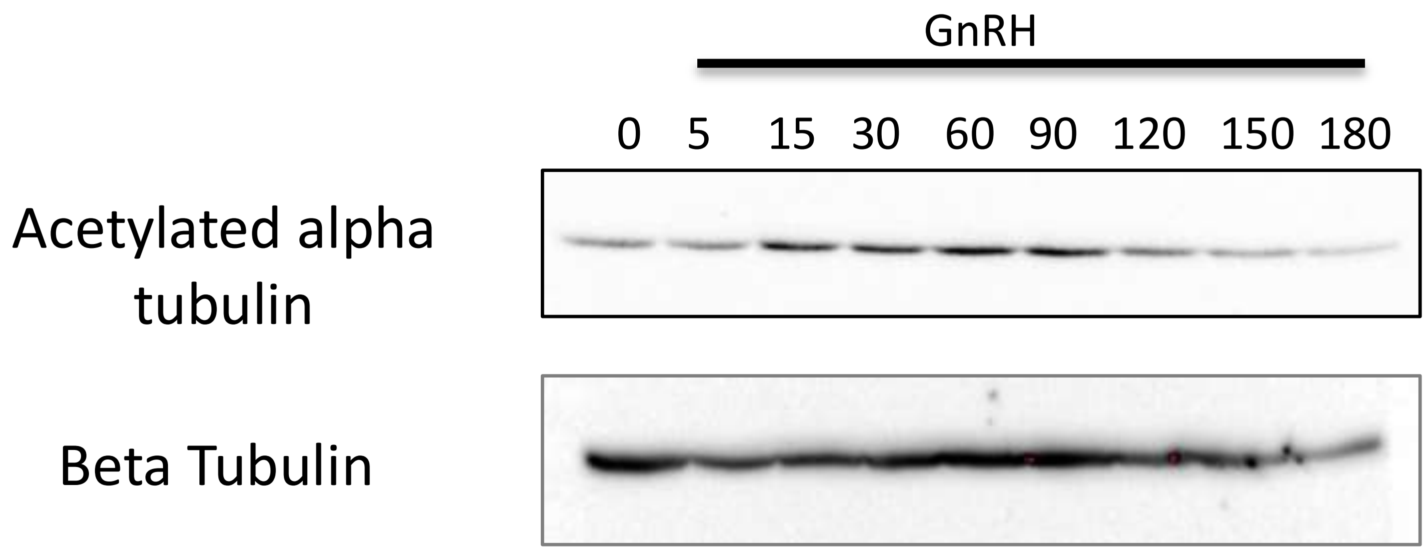


Figure 1: GnRH leads to the acetylation of microtubules in a time dependent manner.

GnRH Specificity

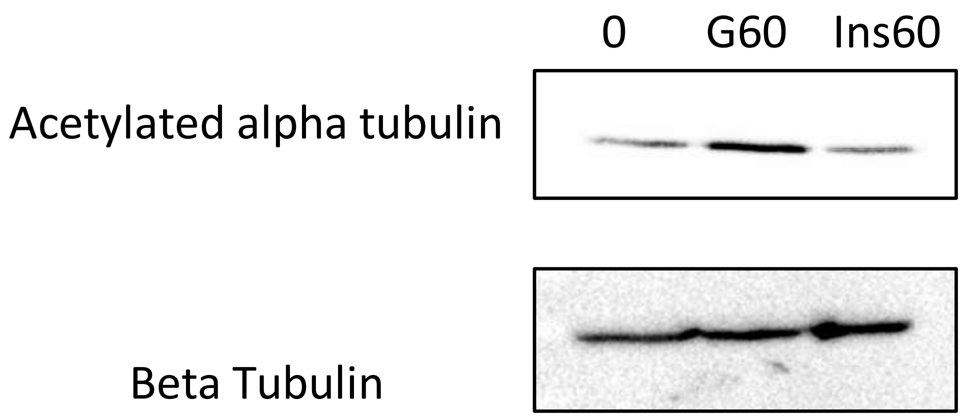


Figure 2: Microtubule acetylation is specific to GnRH.

Tubacin→ Acetylation of Tubulin

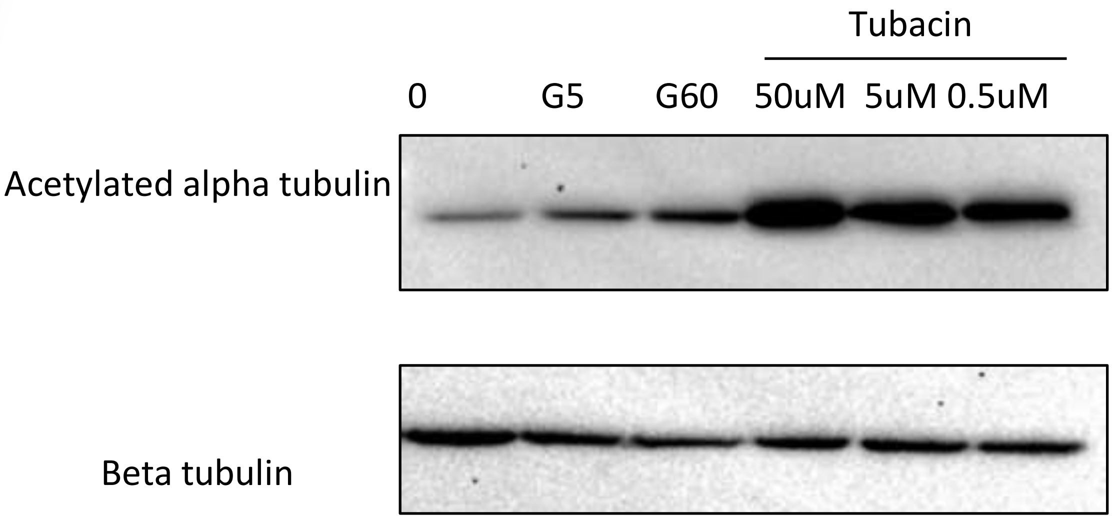


Figure 3: Tubacin, a deacetylase inhibitor, leads to microtubule acetylation in the absence of GnRH.

Conclusions

- Microtubules are an important part of the cytoskeleton
- GnRH binding to gonadotropes can lead to acetylation
- This acetylation may be an important modification for effective secretion of LH and FSH
- Acetylation of microtubules appears to be GnRH specific
- A deacetylase inhibitor keeps microtubules acetylated in the absence of GnRH

Thank You

Amy Navratil, Brittany Jenkins, and other lab members
Wyoming INBRE

References

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