

ESSR Journal Club

Covered Article: “Resistance Exercise-Induced Hypertrophy: A Potential Role for Rapamycin-Insensitive mTOR”

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- 1) Explain the differences between mTORC1 versus mTORC2.
- 2) Explain the differences between rapamycin-sensitive versus rapamycin-insensitive components of mTOR signaling.
- 3) Resistance exercise can stimulate both mTOR signaling and muscle protein synthesis. Explain the association between exercise-induced activation of mTOR and protein synthesis.
- 4) From a structural perspective, explain how rapamycin can inhibit some, but not all, mTORC1-dependent signaling events.
- 5) From a structural perspective, explain why rapamycin does not exert an acute inhibitory effect on mTORC2 signaling.
- 6) What evidence supports the conclusion that signaling by mTORC1, within the muscle cells themselves, is necessary for chronic mechanical overload-induced hypertrophy?
- 7) Why do the data obtained with pharmacological inhibitors AZD-8055 and rapamycin suggest that mTORC2 may play a role in resistance exercise-induced hypertrophy?
- 8) What is the molecular contribution of mTORC2 to the hypertrophy observed in muscle after training with resistance exercises?
- 9) What are the methodological strengths and weaknesses of using pharmacological inhibitors for mechanistic studies?
- 10) What are the strengths and weaknesses of using rat in situ contractions to study the resistance-exercise adaptations observed in humans?