Rpt6 phosphorylation: A Novel mechanism to control proteasome function and its implications in synaptic plasticity and disease.

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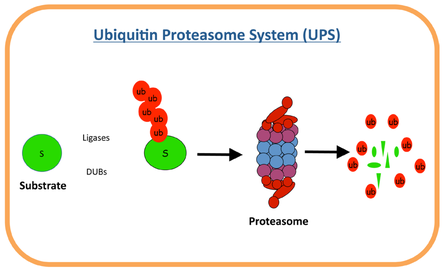
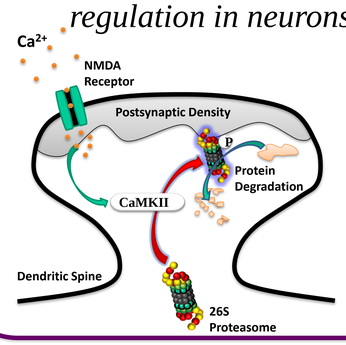
Introduction

The Ubiquitin proteasome system regulates protein homeostasis essential for many cellular processes (cell cycle, DNA repair, Protein sorting, compartmental trafficking, stress responses, endocytosis and protein degradation). Protein degradation happens in neurons and can regulate synaptic plasticity. Dysfunction in protein degradation machinery leads to disease. The Patrick lab studies neuronal activity-dependent protein degradation and has previously shown that phosphorylation of proteasomal subunit Rpt6 can regulate synaptic strength bi-directionally and new spine formation.

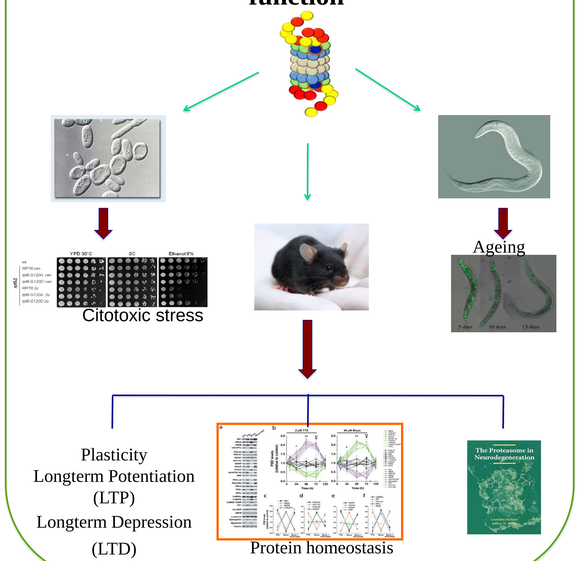


Working Model for proteasomal regulation in neurons



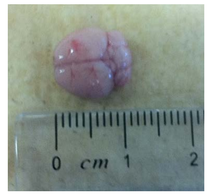
Current Models of Altered proteasome function in the Patrick Lab.

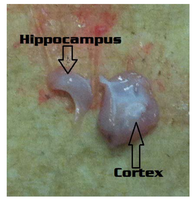
Activity dependent regulation of proteasome function



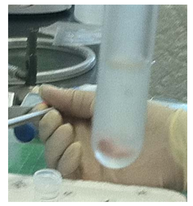
Assessment of RPt6 phosphorylation in wild type C57black6 mice

Euthanasia of C57black6

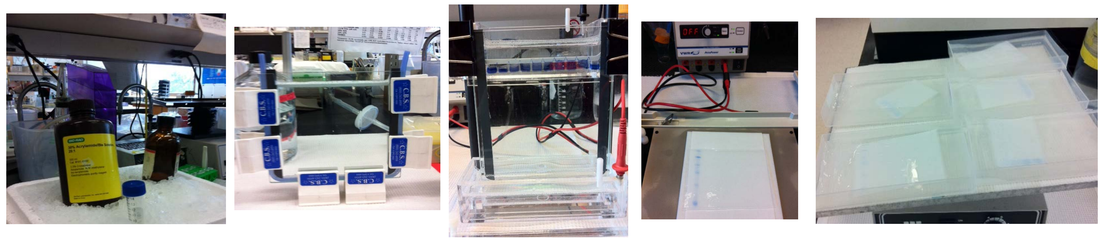




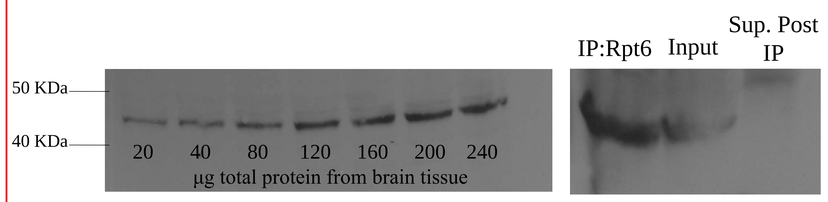
Brain extraction



Brain Lysis

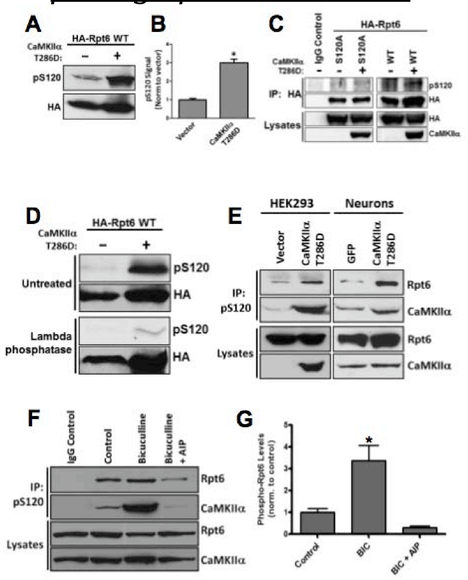


SDS-PAGE and Western Blotting



Phospho Rpt6

Background information and key finding of the Patrick lab



Conclusion

With the validation of this phospho-specific antibody, we can now evaluate how Rpt6 phosphorylation is regulated in both Normal neuronal physiology and age-related as well as in nuerodegenerative disease (e.g. AD, PD,HD)

Acknowledgements

I want to thank Ms. Esther for all of her patience and her wisdom, Dr. Gentry Patrick for all of his helpful guidance, and the scientists of the Patrick Lab for letting me use their equipment and for being my family for the past three weeks. And of course, I thank Dr. Komives for giving me such a wonderful opportunity. And last but not least, I thank my parents for lending an ear over the phone when I was homesick.