

Exocyst is an octameric protein complex that is associated with various vesicle trafficking and secretion events. Interestingly, in plants one subunit of the exocyst complex, Exo70, has been expanded and functionally specialized throughout the evolution. Despite the exciting findings on Exo70 function in plants, the driving forces of this expansion and also the underlying molecular details of Exo70 specialization are mostly unknown. In this thesis, Peter Sobol made significant advancements in Exo70 field by revealing (1) a specific mechanism that shows that localization of the immune associated Exo70 isoform, Exo70B1 is controlled by a well-studied defense associated protein, RIN4; (2) Exo70H4 isoform plays a specific role in callose synthesis in trichomes.

The data presented in this thesis is of very high quality as documented by two peer-reviewed publications. Especially Peter's first author paper very nicely illustrated the function of RIN4 in defense against microbes. RIN4 has been discovered many years ago but the function has remained elusive. Here, Peter Sobol and colleagues suggested RIN4 might function together with Exo70B1 isoform to mediate defense responses. These results have several really exciting implications in both cellular organization of immune responses and also immune signaling in general. It will be very exciting to follow up these results in immune signaling concept.

During his PhD, Peter mastered various techniques such as confocal microscopy, Co-Immunoprecipitation, Yeast-two hybrid, and various other plant cell biology and biochemistry techniques. He has also performed various kinds of molecular cloning. I think overall, the breadth of techniques and the amount of data in this thesis is very good.

I would like to discuss with him during his defense on these topics:

1. Does plasma membrane localized Exo70B1 have any role in secretion or is it functioning more as an autophagy receptor?

2. Can you speculate on the Exo70B1-RIN4 association with respect to RPM1 mediated immune responses?
3. Can you synthesize recent findings on rice and barley Exo70 arms race studies with your findings?
4. Exo70 isoforms seem to play a role in both symbiotic and pathogenic relationships. How do you think the signaling specificity comes from? Are they functioning as signaling platforms? Do they interact with different proteins? Which domains of Exo70 determine the specificity?

Overall, I really enjoyed reading Peter's thesis and I recommend that he get awarded a PhD degree.

Yours sincerely,

Yasin Dagdas, PhD