

Identification of Npl3 as novel prion and stress granules component in *Saccharomyces cerevisiae*

Npl3, is a highly dynamic protein involved in mRNA biogenesis(Windgassen, Sturm et al. 2004, Kress, Krogan et al. 2008, Estrella, Wilkinson et al. 2009, Hackmann, Gross et al. 2011, Moehle, Ryan et al. 2012). Three different bioinformatics analysis have suggested that Npl3 is a potential yeast prion protein (Michelitsch and Weissman 2000, Sondheimer 2000, Alberti, Halfmann et al. 2009). This polypeptide is structurally analogous to the human hnRNPA, since it harbors two central RNA-recognition motifs (RRMs) followed by a C-terminus rich in RGGY/F residues (Henry and Silver 1996, Lee, Henry et al. 1996).Interestingly, hnRNPA protein was scored as a potential prion protein in the human genome. The N-terminus of Npl3 is rich in glutamine and asparagine, two common amino acids previously identified in yeast prion domains (Sondheimer 2000, Osherovich and Weissman 2001, Osherovich, Cox et al. 2004, Wickner, Edskes et al. 2006). Interestingly, recent studies from the Gonzalez laboratory showed that two *npl3* alleles encode proteins able to aggregate into high molecular weight complexes(Windgassen, Sturm et al. 2004, Estrella, Wilkinson et al. 2009). Npl3 has also been associated with stress granules(Rajyaguru, She et al. 2012), which are aggregates of proteins and mRNAs formed during stress conditions(Anderson and Kedersha 2002) . Notably, prions increase their appearance under stress conditions (Tyedmers, Madariaga et al. 2008, Halfmann, Alberti et al. 2010). The similarities in behavior and structure of the shuttling protein Npl3 to yeast prions, suggest that Npl3 might display prion activity.