Developing a Yeast Model of Amyotrophic Lateral Sclerosis Involving the SOD1 Gene (Poster)

Kyler Pawlowski, Montana State University, Billings
Joy Goffena, Department of Biological and Physical Sciences, Montana State University, Billings
David K. Butler, Montana State University, Billings

Amyotrophic lateral sclerosis (ALS), one of the most common neuromuscular diseases in the world, is an unremittingly progressive disease that degenerates motor neurons in the brain and spinal cord. Roughly 10% of ALS cases are considered familial and can result from mutations in more than dozen different genes. The most common mutations in familial ALS occur in the SOD1 gene. SOD1 encodes a copper-zinc superoxide dismutase that detoxifies oxygen free radicals. To date, approximately 140 mutations in SOD1 (many of which are missense) have been linked to familial ALS. Evidence suggests that these mutations induce SOD1 protein misfolding and aggregation into cytotoxic structures. We are developing a yeast model of ALS based on the expression of mutant human SOD1 proteins. Such a yeast system will permit high throughput genetic screens to identify genes that enhance or suppress the toxic phenotypes associated with mutant SOD1 expression (thereby identifying critical supporting or suppressing pathways), as well as chemical screens to identify compounds that inhibit mutant SOD1 toxicity.