

S11-22) Jens Hamar (USA)

INVESTIGATION OF IMPA1.1 REGULATION IN EURYHALINE FISHES USING GENETIC MANIPULATIONS OF CELL CULTURES

Hamar, J.C., Li, J., and Kültz, D. University of California Davis, One Shields Ave Davis CA 95616

Aquatic animals existing in variable salinity environments must possess mechanisms to maintain cellular osmotic balance essential for function. When facing hyper-osmotic stress, some cells can produce biochemically inert compatible organic osmolytes, such as myoinositol, to combat the osmotic gradient across the cell membrane. Myo-inositol is commonly utilized in this manner across widely diverse taxa. The final enzyme in the myo-inositol synthesis pathway is IMPA1.1 which has been shown to be highly upregulated in multiple tissues in several fish species in response to hyperosmotic challenge including *Oreochromis mossambicus*, a teleost fish tolerant of extreme hypersaline conditions. When the regulatory region of IMPA1.1 from this species was cloned upstream of multiple reporter genes and 73 transfected into cell cultures, high reporter activity was observed in cells of both this species and a distantly related species, suggesting high conservation of regulatory elements and utilization of a common hyperosmotic response signaling pathway. Current work includes further genetic manipulations of this pathway in cell culture models to decipher its components from cellular osmosensing leading to differential regulation of relevant genes.

Supported by NSF award 1656371 and BARD award IS-4800-15 R.