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Meeting Abstract

83-2 Sat Jan 2 **A data-independent acquisition (DIA) assay library for quantitation of environmental effects on the kidney proteome of Oreochromis niloticus** *Root, L*; Cnaani, A; Campo, A; MacNiven, L; Kültz, D; University of California, Davis; Agricultural Research Organization, Israel; Agricultural Research Organization, Israel; University of California, Davis; University of California, Davis* ltroot@ucdavis.edu

Interactions of organisms with their environment are complex and regulation at different levels of biological organization from genotype to phenotype is often non-linear. While studies of transcriptome regulation are now common for many species, corresponding quantitative studies of environmental effects on proteomes are needed. Here we report the generation of a data-independent acquisition (DIA) assay library that enables simultaneous targeted proteomics of thousands of *O. niloticus* kidney proteins using a label- and gel-free workflow that is well suited for ecologically relevant field samples. Transcript and protein abundance differences in kidneys of tilapia acclimated to freshwater and brackish water (25 g/kg) were correlated for 2114 unique genes. A high degree of non-linearity in salinity-dependent regulation of transcriptomes and proteomes was revealed, demonstrating the complementary nature of the DIA assay library approach and suggesting that the regulation of *O. niloticus* renal function by environmental salinity relies heavily on post-transcriptional mechanisms. In addition to significance testing, the application of functional enrichment analyses using STRING and KEGG to DIA assay datasets identified *myo*-inositol metabolism, antioxidant and xenobiotic functions, and signaling mechanisms as key elements controlled by salinity in tilapia kidneys. In conclusion, this study presents an innovative approach for targeted quantitative proteomics used to identify proteins and biological processes that are regulated non-linearly at mRNA and protein levels during a change of environmental salinity. Funded by NSF grant IOS-1656371, BARD, and AES projects CA-D-ASC-7690-H and CA-D-ASC-7624RR