

## A statistically enhanced spectral counting approach to tcdd cardiac toxicity on the adult zebrafish heart

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**2**,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) is a persistent environmental pollutant and teratogen that produces cardiac toxicity in the developing zebrafish. Here we adopted a label free quantitative proteomic approach based on normalized spectral abundance factor (NSAF) to investigate the disturbance of the cardiac proteome induced by TCDD in the adult zebrafish heart. The protein expression level change between TCDD treated and control zebrafish hearts were systematically evaluated by a large scale MudPIT analysis which incorporated triplicate analyses for both control and TCDD exposed heart proteomic samples to overcome the data dependant variation in shotgun proteomic experiments and obtain a statistically significant protein dataset with improved quantification confidence. A total of 554 and 467 proteins were identified from control and TCDD treated hearts, among which 106 proteins showed statistically significant expression changes. 61 proteins were found to be upregulated ( $> 1.5$  fold,  $p < 0.05$ ) in TCDD treated hearts, while 45 proteins showed statistically significant down-regulation ( $< 0.5$  fold,  $p < 0.05$ ) in TCDD treated hearts. The proteins identified as altered by TCDD encompass a wide range of biological functions including calcium handling, myocardium cell architecture, energy production and metabolism, mitochondrial homeostasis, and stress response. Together our results indicate that TCDD exposure alters the adult zebrafish heart in a way that could result in cardiac hypertrophy and heart failure, and suggests a mechanism for the diastolic dysfunction observed in TCDD exposed embryos.

### Biography

Jiang Zhang completed his Ph.D from the University of Wisconsin – Madison and is currently a research associate at the University of California – Los Angeles. He has published more than 15 papers in reputed journals and serves as a reviewer as well.

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