

JOINT EVENT

5th World Conference on **Climate Change**

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16th Annual Meeting onOctober 04-06, 2018
London, UK**Environmental Toxicology and Biological Systems****Electrophysiological methods for environmental toxicology and pharmacology: Standard organisms and amphioxus models****David E Schmitt**
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Mirroring developments in safety pharmacology, the search for high-throughput, electrophysiological methods for the testing, screening, and establishment of environmental regulatory monitoring protocols is a worthwhile, as an adjunct to bioassays, such as whole effluent toxicity (WET) tests. A lingering problem with WET testing is assessing initial vitality of the organism. Accessible, metabolically active tissues, such as respiratory membranes of minnows and mussels, are possibilities for electrophysiological recording and early detection of toxicity. Excitable tissues are additionally useful, especially those with tonic or phasic bursting that may be up and down regulated, expanding the dynamic range of responses to contaminants (e.g., fish lateral line cells). The spinal neural networks of lamprey underlying motoneuronal commands for fictive sinusoidal swimming are readily challenged with minimal-volume perfusate containing substances have been well studied with extracellular, intracellular and patch-clamping methods. Measures of unilateral burst quality, intersegmental phase lag (forward and backward swimming) and alternation quality (sinusoidal swimming) are candidates for developing figures of merit. Amphioxus possesses the general Bauplan of the Chordate nervous system and could be expected to respond to a range of contaminants. Amphioxus possesses a quasi-tubular (U-shaped), nervous system involuted from the embryonic ciliated exterior which, in larval form, is confluent via an opening between ambient water and the central canal. The latter possesses excitable cilia (mechanically and chemically) and photic cells. The cilia may represent a system by which the larval form sampled nutritive gradients of peptides, carbohydrates and noxious substances in ambient water and moved accordingly. Ependymal cilia also are motile and sensitive to body movements. Spinal networks, governed by the brain, mediate the basic approach and withdraw behavior (with potential for correlative behavioral assay of noxious contaminants). With all of the potential for WET testing, these organisms offer numerous additional opportunities for electrophysiological approaches to identifying and monitoring contaminants.

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