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JOINT EVENT
5th World Conference on
&
16th Annual Meeting on

October 04-06, 2018
London, UK

Environ Pollut Climate Change 2018, Volume 2
DOI: 10.4172/2573-458X-C1-003

(O H F W U R S K \ V L R O R J L F D O P H W K R G V I R U H Q Y L U R Q P H Q W D O W R [and amphioxus models

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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 e uent 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 mussel 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 response to contaminants (e.g., sh lateral line cells). e spinal neural networks of lamprey underlying motoneuronal commands for ctive 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 gures of merit. Amphioxus possesses the general Bauplan of the Chordate nervous system and could be expected to respo to a range of contaminants. Amphioxus possesses a quasi-tubular (U-shaped), nervous system involuted from the embryoni ciliated exterior which, in larval form, is con uent via an opening between ambient water and the central canal. e latter possesses excitable cilia (mechanically and chemically) and photic cells. e cilia may represent a system by which the larva 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 bas approach and withdraw behavior (with potential for correlative behavioral assay of noxious contaminants). With all of the potential for WET testing, these organisms o er numerous additional opportunities for electrophysiological approaches to identifying and monitoring contaminants.

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