Does Carbamazepine exposure lead to histopathological impairments in the Arctic scallop *Chlamys islandica?*

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Chlamys islandica is an abundant but scarcely studied arctic marine scallop. On average, this scallop populations living within 1 m^2 area are known to clear 1,921,000 litres of water and 14,015 g of particulates annually. The Scallop as a result presents a high susceptibility to pollutants currently found within the Arctic seawater and ecosystems, which in turn yields itself into being an excellent early bioindicator species for ecotoxicology. Human pharmaceuticals are one such pollutant, although their impacts on the arctic marine ecosystems have not been studied. Carbamazepine has been identified as a prevalent pollutant within the arctic marine ecosystem. Belonging to the family of anticonvulsant, it is a Na^+ channel blocker which binds preferentially to voltage-gated sodium channels in their inactive conformation, which prevents repetitive and sustained firing of an action potential and is a known modulator of the serotonin system. Carbamazepine thus has been known to affect the tissue assemblages, neuroendocrine system, cell viability, immunity, reproduction, feeding behaviours and growth within marine organisms. This study evaluates the effect of carbamazepine exposure on the structure and physiological state of *Chlamys islandica* tissues through the use of histopathological techniques (i.e. hematoxylin and eosin staining). The results present impairments imposed on the gonadal, gill, and digestive tissue structures, as well as spawning behaviour of the scallop. Hence the study provides evidence that carbamazepine exposure negatively affects the scallop population and thus may have a broader effect on the arctic marine ecosystem.