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Preface

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Coastal communities have been plagued by problems with harmful algal blooms (HABs) for hundreds of years. Cases of suspected ciguatera fish poisoning were first described in 1555 (Lewis, 1986) and the earliest records of human deaths due to paralytic shellfish poisoning in the Pacific Northwest date back to the 1790s (Quayle, 1969). However, identification of the toxins and toxin assemblages associated with HABs, and studies of their impact on ocean ecosystems, did not hold a prominent place in the scientific literature until the second half of the of the 20th century, with the greatest advances occurring over the past 30 years. Moreover, during this time period, knowledge of HAB distribution, factors associated with proliferation, temporal and spatial distribution, toxin identification, and toxin detection in the ocean environment have greatly outpaced knowledge of the potential impacts of HABs on human health. To date, there are no established human biomarkers for any of the five known HAB related illness and syndromes, including amnesic shellfish poisoning, paralytic shellfish poisoning, diarrhetic shellfish poisoning, ciguatera fish poisoning and neurotoxic shellfish poisoning. In addition, human health studies have been plagued with reliance upon sporadic clusters of naturally-occurring illnesses or syndromes, difficulties establishing exposure levels, questions of "immunity" in select subcultures, and the complexities of changing biological responses across the human lifespan (pre-natal through geriatric).

Despite these challenges, there has been a growing body of knowledge associated with HAB-related human illnesses. This special issue of Harmful Algae is dedicated to elucidating some of the most recent and original work that will further the understanding of human exposure risk and perception of HABs. Included in this special issue are articles spanning a wide range of subjects at the interface of medical and ocean science including: a brief overview of the known HAB clinical syndromes; the methods and results from the first four years of data collection of a cohort study investigating the potential impact of low level chronic exposure to domoic acid; a novel method for assessing dietary exposure in real time; a study of the genetic basis for potential human resistance to toxins; a preliminary genetic profile of humans with exposure to ciguatoxins; and studies of risk perception which will directly enhance risk communication and outreach.

Although numerous questions still remain unanswered, it is anticipated that these human health studies will provide a foundation for further advancements in understanding HAB-related illnesses to facilitate their prevention, early detection, and treatment. Studies that build bridges across research disciplines will promote closer working relationships between HAB scientists; public health clinicians and researchers; and medical doctors, all of which are necessary collaborations to advance understanding of the relationships between human health and HABs. With the projected alterations in intensity and duration of existing HABs as well as global expansion of warm-water HABs due to climate change, it is essential that close collaborations be fostered to reduce the impact of these toxins on human health.

References

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