PhD Opportunity for APA/IPRS (or equivalent) applicants

Characterisation of taste and odour compounds produced by cyanobacteria

UNSW Water Research Centre, School of Civil and Environmental Engineering/
School of Chemical Engineering/ Australian Water Quality Centre

An operating allowance and PhD top-up scholarship is available for a successful APA/IPRS applicant via ARC Linkage Grant LP130100033: On-line monitoring of cyanobacteria to predict coagulant doses and powdered activated carbon application in water treatment. Cyanobacteria are increasingly challenging the capability of drinking water and advanced wastewater treatment works to meet Australian drinking and recycled water guidelines due to the release of metabolites including cyanotoxins and taste and odour (T&O) compounds that adversely impact water quality. 2-methylisoborneol (2-MIB) and geosmin (produced by cyanobacteria) are considered to be the dominated T&O compounds. However, in order to take steps in a timely manner to prevent them entering the distribution system it is necessary to be able to accurately measure these compounds and potentially other compounds (produced by cyanobacteria) that also contribute to T&O complaints in water supplies. As more sophisticated analytical approaches are developed to investigate T&O compounds, we are able to apply these techniques to have a more comprehensive understanding of T&O causing compounds so that better risk management strategies for their management, including mitigation and treatment, can be established.

This PhD proposal seeks to investigate the broad range of odour-causing compounds produced by cyanobacteria using a novel application of coupling an olfactory port to gas chromatography-mass spectrometry (GC-MS/O), as well as other high-resolution analytical techniques, to fully characterise via exploratory methods the full range of odorous contaminants produced by cyanobacteria. It is anticipated that this project will improve the analytical and olfactory approach for assessing the composition of odours from cyanobacteria and produce a comprehensive database for T&O compounds found in water supply sources across Australia to assist water suppliers in better managing water sources and downstream treatment for T&O removal.

The successful student will join the ARC Linkage project team that entails a substantial collaboration between the School of Chemical Engineering, School of Civil and Environmental Engineering the Australian Water Quality Centre (SA Water, Adelaide), National Cheng Kung University (Taiwan) and a further six industry partners. The student will have access to state-of-the-art analytical equipment available in the UNSW Water Research Centre, Water Quality Laboratories, including the ‘UNSW Odour Laboratory’. The suitable candidate will have a background in either chemistry and/or chemical or environmental engineering. The candidate should have a demonstrated aptitude for undertaking laboratory work and an understanding of water treatment technologies. The candidate should have excellent communication skills and will be expected to interact regularly with industry partners. It is expected that the student apply for their own scholarship via APA or IPRS schemes (or equivalent).

Further information on the project and scholarship on offer may be obtained from Prof Richard Stuetz (email: r.stuetz@unsw.edu.au). Applications for the scholarships (including a cover letter, academic transcript and CV) should be submitted to Prof Stuetz, School of Civil and Environmental Engineering, University of New South Wales, Sydney NSW 2052.