



Biocide ToolBox

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BTB PARTNER: CAWTHRON INSTITUTE



Cawthron Institute, located in Nelson at the top of the South Island, is New Zealand's largest independent research provider. Undertaking a wide range of independent scientific research and commercial consulting, Cawthron brings to the Biocide Toolbox its specific expertise in marine natural products chemistry, marine antifouling testing and formulation development, and ecotoxicology. A range of natural marine products are available at Cawthron that are potential lead compounds for biocide development. One example of these is a group of algal derived spiroidimines with potent marine antifouling activity. Other biocides developed in the wider Biocide Toolbox programme may also be suitable for marine antifouling applications, with Cawthron's antifouling screening capabilities able to facilitate such investiga-

tions. In-house ecotoxicological expertise is also available to assess the environmental safety of biocides and formulations; a key requirement for components of product registration processes.



Dr Patrick Cahill is a research scientist at Cawthron Institute, specialising in marine antifouling. Patrick completed his PhD through The University of Auckland's Institute of Marine Science, where he developed biocide-based methods to counteract biofouling in the New Zealand mussel aquaculture industry. His work in marine antifouling has more recently expanded into ship-hull fouling, with an emphasis on developing eco-friendly alternatives to the antifouling biocides currently available. Patrick has developed a suite of laboratory bioassays to rapidly screen for marine antifouling activity, from which promising leads can then be progressed to field-testing. In the Biocide Toolbox to date, Patrick has been exploring the antifouling activity of select natural compounds from Cawthron and is part of a project

to develop novel antifouling biocides.

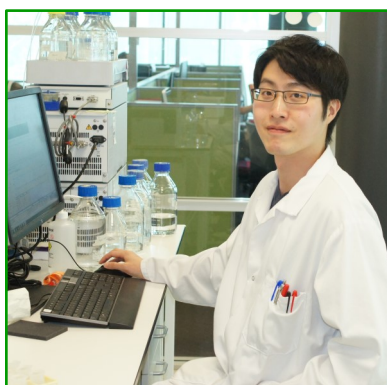


Dr Louis Tremblay is an environmental toxicologist who leads Cawthron's Ecotoxicology Team, and a Senior Lecturer at the University of Auckland's

School of Biological Sciences. Louis' team can conduct a range of standard toxicity tests using model organisms of relevance to New Zealand freshwater and marine environments. Louis has experience with working with the EPA's Hazardous Substances and New Organisms (HSNO) team on a range of chemical registration processes that will be useful to the Biocide Toolbox programme in developing products right through to commercialisation.



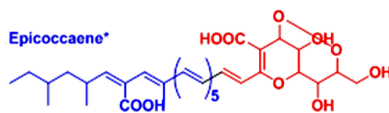
PHD PROJECT: EPICOCCUM DERIVED ANTIMICROBIALS



PHD STUDENT ALEX LEE

Alex received a MSc in biological sciences at the University of Auckland. He's passionate about biological activities of natural microbial pigments and biotechnology.

Alex's project aims to determine the mechanism of action of 'epicoccaene', a yellow/orange pigment produced by the fungus *Epicoccum purpurascens*.



By combining a range of imaging and omics approaches (e.g. genomics, transcriptomics, proteomics, and metabolomics), Alex and his team strive to understand how this antifungal natural compound kills moulds.

Epicoccaene contains a peroxide group, and has shown activity against

moulds but not yeasts, which is exceptionally rare in nature as most antifungal agents target both forms, since they are all fungi. Therefore, epicoccaene could be a fungicidal molecule with a novel mode of action. Understanding it will provide an opportunity for developing novel antifungal compounds for commercial purposes.



Epicoccum purpurascens
PRODUCING PIGMENT DROPLETS

BTB supported by MBIE



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