

Chemicals to Remove and Prevent Biofilm

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Abstract : Aequor's Founder, a Marine and Medical Microbiologist, discovered novel, non-toxic chemicals in the ocean that uniquely remove biofilm in minutes and prevent its formation for days. These chemicals and over 70 synthesized analogs that Aequor developed can replace thousands of toxic biocides used in consumer and industrial products and, as new drug candidates, kill biofilm-forming bacteria and fungi Superbugs -the antimicrobial-resistant (AMR) pathogens for which there is no cure. Cynthia Burzell, PhD., is a Marine and Medical Microbiologist studying natural mechanisms that inhibit biofilm formation on surfaces in contact with water. In 2002, she discovered a new genus and several new species of marine microbes that produce small molecules that remove biofilm in minutes and prevent its formation for days. The molecules include new antimicrobials that can replace thousands of toxic biocides used in consumer and industrial products and can be developed into new drug candidates to kill the biofilm-forming bacteria and fungi -- including the antimicrobial-resistant (AMR) Superbugs for which there is no cure. Today, Aequor has over 70 chemicals that are divided into categories: (1) Novel natural chemicals. Lonza validated that the primary natural chemical removed biofilm in minutes and stated: "Nothing else known can do this at non-toxic doses." (2) Specialty chemicals. 25 of these structural analogs are already approved under the U.S. Environmental Protection Agency (EPA)'s Toxic Substances Control Act, certified as "green" and available for immediate sale. These have been validated for the following agro-industrial verticals: (a) Surface cleaners: The U.S. Department of Agriculture validated that low concentrations of Aequor's formulations provide deep cleaning of inert, nano and organic surfaces and materials; (b) Water treatments: NASA validated that one dose of Aequor's treatment in the International Space Station's water reuse/recycling system lasted 15 months without replenishment. DOE validated that our treatments lower energy consumption by over 10% in buildings and industrial processes. Future validations include pilot projects with the EPA to test efficacy in hospital plumbing systems. (c) Algae cultivation and yeast fermentation: The U.S. Department of Energy (DOE) validated that Aequor's treatment boosted biomass of renewable feedstocks by 40% in half the time -- increasing the profitability of biofuels and biobased co-products. DOE also validated increased yields and crop protection of algae under cultivation in open ponds. A private oil and gas company validated decontamination of oilfield water. (3) New structural analogs. These kill Gram-negative and Gram-positive bacteria and fungi alone, in combinations with each other, and in combination with low doses of existing, ineffective antibiotics (including Penicillin), "potentiating" them to kill AMR pathogens at doses too low to trigger resistance. Both the U.S. National Institutes for Health (NIH) and Department of Defense (DOD) has executed contracts with Aequor to provide the pre-clinical trials needed for these new drug candidates to enter the regulatory approval pipelines. Aequor seeks partners/licensees to commercialize its specialty chemicals and support to evaluate the optimal methods to scale-up of several new structural analogs via activity-guided fractionation and/or biosynthesis in order to initiate the NIH and DOD pre-clinical trials.

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