Identification of cyanotoxin oligopeptides with aerolysin nanopore

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Microcystins (MCs) are cyanotoxin oligopeptides produced by cyanobacteria, which compromise water quality. Directly monitoring cyanotoxin concentrations in water is challenging, due to the low concentration and high structural diversity of these toxins. The limitations of the present analytical methods can be overcome by the development of a single-molecule nanopore-based sensing platform allowing for portable, real-time, standard-free measurements for cyanotoxins in lake water. This approach would optimize cyanotoxin detection and quantification by accelerating the process, which is crucial for preserving water quality and protecting public health. Experiments have demonstrated the possibility to discriminate 3 most common microcystin variants only differing by a single amino acid.