Technical Report 0426

# Rapid microbiological indicators methods

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## EXECUTIVE SUMMARY

The Rapid Microbiological Indicator Methods Workshop was held at Moss Landing and Seaside, California May 14-16, 2003. The workshop was sponsored by Alliance for Coastal Technologies partner organizations Moss Landing Marine Laboratories (MLML) and Monterey Bay Aquarium Research Institute (MBARI) and co-sponsored by the Southern California Coastal Water Research Project (SCCWRP) and the California State Water Resources Control Board (CSWRCB).

The goals of the workshop were to: (1) Exchange information about the present state of technologies targeting rapid «4 h) and sensitive «100 enterococci per 100 mL) detection of microbes in natural water samples, (2) Identify technical impediments to routine implementation and regulatory acceptance of new technologies, (3) Outline strategies for evaluating performance of emerging technologies and (4) Identify the principal non-technical impediments to commercial development of rapid microbiological indicator methods for application in water quality monitoring programs.

The fust day of the workshop was open to the public and involved 16 presentations summarizing progress in development of rapid microbiological indicators. The second two days were devoted to small working groups of invited participants developing consensus 'about impediments to future application of new indicator technologies in water quality monitoring programs. Invited participants were selected to ensure representation from three segments of the community: researchers, commercial vendors and water quality managers. The working groups reached the following conclusions and recommendations:

- Current beach monitoring systems will undergo comprehensive evolution during the coming decade and this evolution will substantially enhance our ability to correctly and rapidly identify when recreational waters are contaminated with microorganisms pathogenic to humans.

- There are three broad classes of rapid methods that are under development and research investment in all three is warranted. The most advanced are those in the enzyme/substrate class because they are enhancements of currently approved methods. Molecular surface recognition and nucleic acid based methods are comparatively less well developed, but have potential for being even more rapid, more sensitive and adaptable to a wider class of indicators and pathogens.

- The biggest technical challenge is sensitivity. Present technology is able to accurately identify the microbial indicators of interest in a short time, but only at concentrations well above water quality standards. Research investment should focus on developing preconcentration technology that will improve sensitivity.

- The biggest non-technical impediment is regulatory approval. The approval process is illdefined and likely to be expensive relative to size of the market. EPA needs to better define the criteria for approval and develop a strategy for assisting vendors navigate this process.

- There is need for a market survey to defme customer needs. The survey should address potential overlap among markets for monitoring of marine beaches, freshwater beaches, shellfish beds and drinking water, all of which use similar indicators.

## Full Text
ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/426_RapidMicroIndicatorMethods.pdf