

MICROBIOLOGY AND PARASITOLOGY CAPABILITIES



science, technology
& innovation

Department:
Science, Technology and Innovation
REPUBLIC OF SOUTH AFRICA



CSIR

Touching lives through innovation

The CSIR Microbiology and Parasitology Laboratory

is a leading, specialised facility dedicated to detecting disease-causing microorganisms in water and understanding their impact on human health.

Our laboratory is South African National Accreditation System (SANAS) accredited for the testing of the protozoan parasites, *Cryptosporidium* and *Giardia* (Facility T0657) and is the only facility in South Africa capable of performing testing of cytopathogenic viruses in water samples using primate cell lines. In addition to pathogen testing, the CSIR is equipped to detect indicator microorganisms required by the South African National Drinking Water Standard (SANS 241), providing comprehensive support to the water sector.

For more than two decades, the laboratory has provided specialised testing services and developed innovative methods to detect niche waterborne pathogens, supporting water safety and public health across southern Africa.



OUR KEY FOCUS AREAS

- **Detection** of niche waterborne microbes, including bacteria, viruses and parasites that require specialised equipment and advanced testing approaches;
- **Wastewater-based epidemiology and surveillance** to support public health interventions;
- **Development** of new methods for the detection of emerging microbial waterborne pathogens;
- **Monitoring** of surface water, groundwater, wastewater and drinking water to determine resource water quality for decision support; and
- **Water quality interventions** to improve community health.

Many laboratories test for microbial indicators such as *Escherichia coli* (*E. coli*). Indicator organisms provide useful information, especially for detecting sewage contamination, and are widely used because they are cost-effective and simple to test for.

However, this approach does not detect all health risks. Some pathogens are more resistant to disinfection than *E. coli* and can survive for longer in aquatic environments. The CSIR Microbiology and Parasitology Laboratory specialises in detecting these hard-to-identify microbes, ensuring that water safety risks that are often overlooked are properly addressed.

A LEADER IN WATERBORNE VIROLOGY

The CSIR has been developing testing methods for waterborne viruses since the 1990s, establishing itself as a leader in this specialised field. During the Covid-19 pandemic, the laboratory played a key role in developing wastewater-based epidemiology approaches for disease tracking and monitoring.

Using advanced molecular detection techniques, scientists can detect and quantify viral ribonucleic acid (RNA) in wastewater to estimate infection levels within communities. This approach allows health authorities to monitor disease spread without testing individuals directly.

The laboratory performs specialised testing for a range of waterborne pathogens, including:

Viruses

- Cytopathogenic viruses using tissue culture methods; and
- Enterovirus, norovirus and SARS-CoV-2 using polymerase chain reaction (PCR)

Bacteria

- *Salmonella*, *Shigella* and *Vibrio cholerae* (the bacterium that causes cholera) using PCR; and
- *Legionella* using liquid culture and enzyme detection technology.

Parasites

- Protozoan parasites, including *Giardia* and *Cryptosporidium*, using immunomagnetic separation and fluorescence microscopy (SANAS accredited);
- Helminth ova (intestinal worm eggs); and
- Bilharzia larvae using light microscopy.



OUR OFFERING **TO THE INDUSTRY**

The CSIR Microbiology and Parasitology Laboratory provides specialised services to a wide range of organisations, including:

- Water utilities
- Municipalities
- Bottled water companies
- Healthcare facilities
- Food production companies
- Mining sector organisations
- Private borehole owners

Our expertise supports water quality monitoring, public health protection and environmental safety across southern Africa.



**LET US COLLABORATE
AND TOUCH
LIVES THROUGH
INNOVATION!**



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