



BC Centre for Disease Control
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Dear BC colleagues,

We are glad to inform you of a number of developments at the BCCDC PHL TB/Mycobacteriology Section that have bearing on TAT and availability of laboratory results for *Mycobacterium* spp. organisms.

In summer of 2023, BCCDC PHL TB lab has become the first provincial laboratory in Canada to transition from the previously used MIRU-VNTR method for **TB genotyping** to universal prospective **whole genome sequencing (WGS)-based analysis**. This approach allows concurrent genotyping, identification of drug resistance markers, and identification of TB complex subspecies. As a result of this development, you can expect:

1. One cultured *M. tuberculosis* complex organism per patient per anatomic site will have **genotypic prediction for antimicrobial resistance** reported. Testing will be repeated on a new isolate if the patient remains culture-positive 3 months post-diagnosis. Genotypic predictions will be available for a subset of antimicrobial agents which have been validated to have high sensitivity and provide a high positive predictive value. Please note that phenotypic susceptibility testing remains the gold standard for *M. tuberculosis* and will continue to be performed on all cultured isolates. Depending on the rate of growth of *M. tuberculosis* isolates, genotypic predictions may be made available to clinicians in advance of phenotypic susceptibility results.
2. Every cultured ***M. tuberculosis* complex** organism will have identification provided to **sub-species level**. Previously this information was only provided for extra-pulmonary TB cases. Appearance of novel sub-species types among pulmonary cases at this time would be reflective of a change in laboratory practice, rather than TB epidemiology.
3. Every cultured *M. tuberculosis* complex organism will be compared via WGS for relatedness against other isolates in BC, both currently and historically circulating. Public Health practitioners will be provided with **cluster reports** of any identified clusters

of related organisms to prospectively assist with contact tracing and follow up. Any healthcare practitioner can request a report on relatedness of an organism of interest by submitting this form to the laboratory:

[TB WGS Cluster Investigation Report Request \(elabhandbook.info\)](http://elabhandbook.info)

In fall of 2023, BCCDC PHL TB lab has introduced a **next-generation sequencing (NGS) – based amplicon sequencing** to provide both identification of non-tuberculous mycobacteria (NTMs), prediction of inducible macrolide resistance for *M. abscessus* complex members, as well as direct-from-specimen genotypic resistance predictions for a number of antimicrobial drugs on specimens with sufficient microbial load. Amplicon NGS resistance testing is done for the following drugs: isoniazid, rifampin, pyrazinamide, fluoroquinolones. As a result of this development, you can:

1. Request **direct-from-specimen genotypic resistance prediction testing** on samples that are AFB smear-positive, have been identified as TB-positive by PCR and come from patients with risk factors for drug-resistant TB infection.
Testing needs to be requested by contacting the BCCDC PHL TB laboratory medical microbiologist on call.
Testing is available twice per week and takes 2-3 business days to complete once the samples is at the BCCDC PHL TB laboratory.
2. Request **direct-from-specimen NTM identification** on samples that are AFB smear-positive, have failed to grow in culture or have clinical indications for rapid identification testing.
Testing needs to be requested by contacting the BCCDC PHL TB laboratory medical microbiologist on call.
Testing is available twice per week and takes 2-3 business days to complete once the samples is at the BCCDC PHL TB laboratory.
3. Expect to see **inducible macrolide resistance genotypic prediction** reported for *M. abscessus* complex organisms that have been requested to have phenotypic susceptibility testing performed.
Phenotypic susceptibility testing continues to be performed at the National Microbiology Laboratory (NML) and susceptibility testing requests need to be submitted as usual, via faxing to BCCDC PHL TB laboratory the NML request forms:

[NTM Susceptibility Request Form \(elabhandbook.info\)](http://elabhandbook.info)

If you have any questions about any of the newly available tests, please do not hesitate to contact the BCCDC PHL TB/Mycobacteriology Laboratory Program Head.

Sincerely,



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