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Evolution of pathology

Pathology has evolved from a profession driven by gross and microscopic description to one that has embraced molecular and genomic biomarkers integrated with traditional pathologic features. This is particularly impactful in the current era of precision oncology, and pathologists are the primary architects of this revolution — a fact reflected by the recent renaming of the specialty from Anatomical Pathology to Diagnostic & Molecular Pathology at the Royal College of Physicians and Surgeons of Canada (RCPSC).

The demand for new assays to support emerging oncology targets, the promise of liquid biopsy tests including minimal residual disease (MRD) detection, and the need for repeat testing to identify resistance-associated genomic alterations place significant pressure on our profession. Sequencing platforms, liquid handling robots, assay validation, and skilled personnel are all costly — yet laboratory expenditures represent only a small fraction of overall treatment costs. Critically, patients cannot proceed with any life-saving therapy without a pathology report and molecular diagnostic findings. Dedicated and sustainable

funding for laboratory medicine must therefore be a primary goal.

Many Canadian laboratories are transitioning to large hybrid capture panels such as the Illumina TruSight Oncology 500 (TSO500), which capture disease-informative alterations alongside genomic instability metrics such as tumor mutation burden and homologous recombination deficiency. The Pan-Canadian Cancer Genomics Community of Practice, supported by the Canada Drug Agency (CDA), the Canadian Partnership Against Cancer (CPAC), and the Canadian Association of Provincial Cancer Agencies (CAPCA), facilitates this work collaboratively. The CDA AMC Biomarker Assessment Framework is standardizing assay approval, and the forthcoming RCPSC Area of Focused Competence in Molecular Diagnostics in Laboratory Medicine (MDLM), expected in 2027, will ensure our trainees are equipped to excel in the era of precision pathology.

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