Alberta Health Services

Laboratory Bulletin

Date: August 18, 2016
To: All Zones - Physicians, Nurses, Laboratory Directors & Managers
From: Genetic Laboratory Services (GLS)
Re: Ewing and Synovial Sarcoma - Change in assay methodology

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Key Messages:
The GLS Molecular Pathology Laboratory at the University of Alberta Hospital has changed the methodology for Ewing and Synovial Sarcoma assays from a RT-PCR to a fluorescence in-situ hybridization (FISH) based assay as first line testing in the differential diagnosis of these sarcomas.

Why this is important:
In Ewing Sarcoma, FISH has been demonstrated to have a higher sensitivity than RT-PCR (Mod Pathol 2006;19(1);1-8; Cesk Patol 2008,44(3):67-70). In synovial sarcoma, FISH has been recommended as the method of first choice as it allows microscopic control of a true positive result (Appl Immunohistocehem Mol Morpholo 200816(3):246-50). Data also demonstrates that employment of a combination of molecular approaches remains a powerful aid to diagnosing synovial sarcoma giving at least 96% sensitivity and 100% specificity (Modern Pathology 2007;20,482-496)

Background:
Ewing Sarcoma (ES) is characterized by the presence of translocations involving the *EWSR1* gene (22q12), resulting in a fusion of this gene with several members of the ETS (E26) family of transcription factors. The translocations are similar in that they are restricted to introns 7-10 of the *EWS* gene and introns 3-9 of the ETS related genes. The most common translocation found is the t(11;22)(q24;q12) resulting in the *EWS/FLI-1* fusion gene found in approximately 90% of cases. The next most common translocation is t(21;22)(q22;q12) resulting in the fusion of *EWSR1* to the *ERG* (21q22). The remaining translocations make up less than 5% of cases. By using the single probe set, LSI *EWSR1*, all ES/PNET can be identified without knowing the translocation partner. Caution should be used with other small round blue cell neoplasms as they may also harbor rearrangements of *EWSR1*. Correlation with morphology and IHC should be used in conjunction with this FISH assay.

Synovial Sarcoma is characterized by t(X;18)(p11.2;q11.2) which is present in virtually all examples. This translocation fuses *SYT* on chromosome 18 with either *SSX1* (66%) or *SSX2* (33%), both located on chromosome Xp11. More rarely, *SYT* is adjoined to *SSX4* also located on chromosome Xp11. Several studies state that the t(X;18)(p11.2;q11.2) is not found at random and arises exclusively in Synovial Sarcoma.

Sample Requirements:
A formalin-fixed, paraffin-embedded tissue block is preferred. Alternatively, one slide stained with Hematoxylin & Eosin as well as six 4-micron baked (2 hours at 60°C) unstained **charged** slides can be submitted. Please provide a copy of the corresponding pathology report.

Action Required:
Please refer to the AHS Central and Edmonton Zone Test Directory for additional test information at:
http://www.albertahealthservices.ca/3217.asp
Standard Turnaround Time: Two weeks from receipt of sample to reporting of results

Inquiries and feedback may be directed to:

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This bulletin has been reviewed and approved by:
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