**SS18 (SYT) (18q11) Gene Rearrangement by FISH**

### Indications for Ordering

Diagnosis of synovial sarcoma in conjunction with histologic and clinical information

### Test Description

Fluorescence in situ hybridization

### Tests to Consider

**Primary test**

**SS18 (SYT) (18q11) Gene Rearrangement by FISH 3001303**
- Molecular diagnosis of synovial sarcoma

**Related test**

**Chromosome FISH, Interphase 2002298**
- Specific probe for **SS18 (SYT)** rearrangement must be requested
- Fresh tissue specimens only

### Disease Overview

**Incidence** – rare
- Synovial sarcomas account for 8-10% of all soft tissue sarcomas

**Diagnostic/prognostic issues**
- Synovial sarcomas may resemble other neoplasms, particularly those displaying an epithelioid, spindle cell, or combined morphology
- t(X;18)(p11.2;q11.2) translocation serves as a specific marker for synovial sarcoma
  - **SS18 (SYT)** gene fuses with **SSX** gene
    - Fusion with **SSX1** in ~65% of synovial sarcomas
    - Fusion with **SSX2** in ~35% of cases
    - Fusions with other **SSX** members (eg, **SSX4**) are rare
      - Specific fusion partners are not detected with this test
  - Fusion transcripts have associations with particular subtypes
    - **SS18-SSX1** is more common in biphasic tumor type
    - **SS18-SSX2** is more common in monophasic tumor type
  - Prognosis
    - **SS18-SSX1** translocation may have a worse prognosis than **SS18-SSX2** translocation

### Genetics

**Translocations** – **SS18-SSX1, SS18-SSX2**

**Structure/function**
- **SS18** is located on chromosome 18
- **SSX1** and **SSX2** are located on the X-chromosome
- Each gene in the translocation codes for proteins that have opposite transcriptional functions
  - **SS18** – activator of oncogenes
  - **SSX1, SSX2** – tumor suppression

### Test Interpretation

**Results**
- Positive – **SS18** rearrangement is detected
  - SSX translocation partner is not identified with this testing methodology
  - Synovial sarcoma likely
- Negative – no **SS18** rearrangement detected
  - Does not entirely exclude the presence of an **SS18** rearrangement as some translocations are cryptic and not evaluable by this testing methodology
  - Does not entirely exclude diagnosis of synovial sarcoma

**Limitations**
- Testing using tissue fixed in alcohol-based or non-formalin fixatives has not been validated using this method
- **SS18** fusion partners are not detected with this test