### General Information

**Lab Order Codes:** TMT

**Synonyms:** TPMT (Thiopurine Methyltransferase); Myelotoxicity

**CPT Codes:** 82657 – Enzyme activity in blood cells, cultured cells, or tissue, not elsewhere specified; nonradioactive substrate, each specimen

**Test Includes:** Thiopurine Methyltransferase Activity in RBC’s reported for 6-Methylmercaptopurine, 6-Methylmercaptopurine riboside and 6-Methylthioguanine riboside in nmol/ml/hr.

### Logistics

**Test Indications:**
- Detection of individuals with low thiopurine methyltransferase (TPMT) activity who are at risk for excessive myelosuppression or severe hematopoietic toxicity when taking thiopurine drugs.
- Detection of individuals with hyperactive TPMT activity who have therapeutic resistance to thiopurine drugs and may develop hepatotoxicity if treated with these drugs.

**Lab Testing Sections:** Chemistry - Sendouts

**Referred to:** Mayo Medical Laboratories (MML Test: TPMT3)

**Phone Numbers:**
- Minneapolis: 612-813-6280
- Saint Paul: 651-220-6550

**Test Availability:** Daily, 24 hours

**Turnaround Time:** 4 – 6 days

**Special Instructions:** TPMT inhibitors may contribute to falsely low results; patients should abstain from these drugs for at least 48 hours prior to TPMT testing.

### Specimen

**Specimen Type:** Whole blood
**Container:** Lavender (EDTA) top tube
Alternate tube: Green (Li Heparin or Na Heparin) top tube

**Draw Volume:** 5 mL (Minimum: 3 mL) blood

**Processed Volume:** Same as Draw Volume

**Collection:** Routine venipuncture

**Special Processing:** Lab Staff: Do Not Centrifuge. Store specimen at refrigerated temps before shipping. Stable for 6 days at 2-8 degrees centigrade. Do Not Freeze. Forward promptly.

**Patient Preparation:** TPMT inhibitors may contribute to falsely low results; patients should abstain from these drugs for at least 48 hours prior to TPMT testing.

**Sample Rejection:** Mislabeled or unlabeled specimens

### Interpretive

<table>
<thead>
<tr>
<th>Reference Range</th>
<th>6-Methylmercaptopurine (normal)</th>
<th>3.00 – 6.66 nmol/mL/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6-Methylmercaptopurine riboside</td>
<td>5.04 – 9.57 nmol/mL/hr</td>
</tr>
<tr>
<td></td>
<td>(normal)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6-Methylguanine riboside (normal)</td>
<td>2.70 – 5.84 nmol/mL/hr</td>
</tr>
</tbody>
</table>

**Critical Values:** N/A

**Limitations:** Thiopurine methyltransferase (TPMT) activity is measured in RBCs. If a patient has had a recent blood transfusion, his true enzyme activity may not be accurately reflected.

TPMT enzyme activity can be inhibited by several drugs such as: naproxen (Aleve), ibuprofen (Advil, Motrin), ketoprofen (Orudis), furosemide (Lasix), sulfasalazine (Azulfidine), mesalamine (Aslaco), olsalazine (Dipentum), mefenamic acid (Ponstel), trimethoprim (Proloprim), methotrexate, thiazide diuretics, and benzoic acid inhibitors. TPMT inhibitors may contribute to falsely low results; patients should abstain from these drugs for at least 48 hours prior to TPMT testing.

Patients with acute lymphoblastic leukemia (ALL) may have lower TPMT activities before treatment and higher activities following treatment.

**Methodology:** Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS)

**References:** Mayo Medical Laboratories February 2017
**Updates:**

2/21/17: Testing now performed at MML with updated test, note new reference ranges.