Clinical Use
- Diagnose and manage Graves disease

Reference Range
≤125% of basal activity

Interpretive Information
- Graves disease
- Hashitoxicosis
- Neonatal thyrotoxicosis

Clinical Background
Autoimmune thyroid disease is associated with a variety of thyroid-related autoantibodies. These include anti-thyroglobulin, anti-thyroid peroxidase, and TSH receptor antibodies. The TSH receptor antibodies may be stimulatory, exerting a TSH-like effect, or inhibitory, blocking the effect of TSH. In the thyroid follicular cell, TSH stimulates cyclic AMP (cAMP), which serves a pivotal role in thyroid cellular activation. Because TSI also stimulates cAMP production, the measurement of TSI bioactivity is accomplished by measuring its capacity to increase production of cAMP in a TSH receptor-expressing cell line.

Studies have shown that TSI is present in 80% to 90% of patients with active Graves disease and absent in some patients with remission. In patients with Graves disease, monitoring TSI levels during pregnancy helps predict neonatal Graves disease. Patients with preexisting Hashimoto thyroiditis who develop hyperthyroidism will also often manifest measurable TSI bioactivity.

TSH receptor antibodies can also be measured by their capacity to inhibit TSH binding to TSH receptors. In this case, they are referred to as TSH receptor binding inhibiting immunoglobulins (TBII, test code 5738X).

Method
- In vitro bioassay (luciferase)
- Analytical sensitivity: 75%
- Analytical specificity: underestimation caused by thyrotropin blocking antibody presence

Specimen Requirements
1 mL refrigerated serum
0.2 mL minimum
No additive red top preferred
SST red top acceptable