Autoimmune diseases are a broad range of related diseases in which a person’s immune system produces an inappropriate response against its own cells, tissues and/or organs, resulting in inflammation and damage. There are over 80 different autoimmune diseases, and these range from common to very rare diseases. Some autoimmune diseases affect mainly one part of the body (e.g. organ-specific such as multiple sclerosis which attacks the nervous system, autoimmune thyroid disease, and Crohn’s disease which is localized to the gastrointestinal tract) whilst others are systemic (such as systemic lupus erythematosus, rheumatoid arthritis and systemic vasculitis).

Systemic autoimmune diseases can affect many body organs and tissues at the same time and they are broadly classified into rheumatological/connective tissue disease and vasculitis (inflammation of blood vessels). Autoimmune diseases collectively affect approximately 5% to 10% of the population of the developed world. Common autoimmune diseases such as thyroiditis, rheumatoid arthritis and diabetes affect more than 1 in 100 people. In contrast, a rare autoimmune disease such as Goodpasture’s disease (a form of vasculitis) affects around 1 in a million people. Autoimmune diseases disproportionately affect women at a rate of 2-9X greater than for men.

### DIAGNOSTICS
Autoimmune diseases are usually diagnosed using a combination of clinical history, blood tests (autoantibodies, inflammation, organ function) and other investigations such as x-rays. Specifically, autoantibodies act as biomarkers helping to diagnose disease subsets and monitor autoimmune diseases. Many autoantibodies have well-defined target antigens and can be detected with high analytical sensitivity for a particular disease.

<table>
<thead>
<tr>
<th>Category</th>
<th>Disease</th>
<th>Tests</th>
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| Connective Tissue Disease | Includes rheumatoid arthritis, systemic lupus erythematosus (SLE), scleroderma, and other systemic autoimmune diseases. | • Anti-cytoplasmic antigens (c-ANCA)  
• Perinuclear antigens of neutrophils (p-ANCA) |
| Vasculitis               | Inflammation in the blood vessels which can lead to serious consequences such as aneurysms. | • Anti-cardiolipin  
• Anti-β2 glycoprotein 1  
• Anti-prothrombin (aPT) |
| Anti-Phospholipid        | Blood clotting disorders, such as Anti-Phospholipid Syndrome (APS) which is a hypercoagulable state caused by antiphospholipid antibodies. | • Cardiolipin  
• β2-glycoprotein 1 |
| Gastrointestinal         | Localized disorders that attack the gastrointestinal track such as Celiac Disease, Crohn’s Disease, ulcerative colitis or inflammatory bowel disease (IBS). | • Tissue transglutaminase (tTG)  
• Liver-kidney microsomal type 1 (LKM-1)  
• pANCA |
| Endocrine                | Thyroid diseases (e.g. Hashimoto's and Graves' diseases), diabetes, adrenal fatigue, osteoporosis, infertility, polycystic ovary syndrome, and several others. Hashimoto’s and Graves’ diseases are the most common autoimmune diseases. | • Glutamic acid decarboxylase (GAD)  
• Tyrosine phosphatase-like islet cell antigen (IA2)  
• Thyroid peroxidase (TPO)  
• Thyroglobulin |
**CONNeCTive TISSuE DiSeASE**

- **mRNP/Sm Ag**
  - A3C304B Native Ag (Calf Thymus) >90%
  - K07102H Human anti-RNP Ag (Human Plasma)

- **Sm (Smith) Ag**
  - R1695 SmD2, Rec. Ag (Insect Cells) >85%
  - A3C303B Native Ag (Calf Thymus) >90%
  - K07108H Human anti-Sm Ag (Human Plasma)

- **SS-A (Ro) Ag**
  - A3C3008 Native Ag (Calf Thymus) >90%
  - K07103H Human anti-Ro (SS-A) Ag (Human Plasma)

- **SS-B (La)**
  - R1691 Rec. Ag (Insect Cells) >85%
  - A3C022B Native Ag (Calf Thymus) >95%
  - K07104H Human anti-SS-B Ag (Human Plasma)

- **Ribosomal P-proteins**
  - R1694 P1, Rec. Ag (Insect Cells) >85%
  - R1692 P2, Rec. Ag (Insect Cells) >85%
  - A01676B Native Ag (Calf Thymus) >90%
  - K07107H Human anti-Ribosomal P Ag (Human Plasma)

- **dsDNA**
  - A01677E Native Ag (E.coli) >90%

- **Ro52**
  - R01649 Rec. Ag (SF21 Insect Cells) >90%

- **Proliferating Cell Nuclear Ag (PCNA)**
  - R01690 Rec. Ag (Insect Cells) >85%
  - R01648 Rec. Ag (SF21 Insect Cells) >90%
  - M1M20-912 MAb to PCNA
  - MAM21-964 MAb to PCNA

- **Histone**
  - A01673B Native Ag (Calf Thymus) >90%

- **Complement C1q**
  - A01670H (Human Plasma) >95%
  - K90020C Sheep anti-Complement C1q

- **C3**
  - L01240G Goat anti-C3

- **C4**
  - L01241G Goat anti-C4
  - L01243G Goat anti-C4

- **U1-snRN C**
  - R1693 Rec. Ag (Insect Cells) >85%

**VAScUlItIS**

- **Annexin**
  - A01682H Native Ag (Human neutrophils)

- **Bacterial permeability increasing factor (BPI)**
  - A01678H Native Ag (Human neutrophils) >90%

- **Cathepsin G**
  - A01679H Native Ag (Human neutrophils)

- **Lactoferrin**
  - A01701H Native Ag (Human neutrophils) >95%
  - A01399H Rec. Ag (Rice Seed) 90%

- **Myeloperoxidase (pANCA)**
  - A3C181H Native Ag (Human neutrophils) >95%
  - K50891R Rabbit anti-Myeloperoxidase

- **Prothrombin**
  - A01681H Native Ag (Human Plasma) >95%

- **Proteinase 3 (cANCA)**
  - A3C192H Native Ag (Human neutrophils) >90%

**ANTI-PHOSPHOLIPID SYNDROME**

- **β2-glycoprotein-1**
  - A3C083H Native Ag (Human Plasma) >95%

**GASTROENTEROLOGY**

- **CELIAC DISEASE**
  - **Tissue Transglutaminase (tGT)**
    - R01650 Rec. Ag (SF21 Insect Cells) >90%

- **CHRONIC INFLAMMATORY BOWEL DISEASE**
  - **Calprotectin**
    - A01671H Native Ag (Human neutrophils) >90%

**NEPHROLOGY**

- **GOODPASTURE’S SYNDROME**
  - **Glomerular Basement Membrane (GBM)**
    - A01672B Native Ag (Bovine Kidney) >90%

**ENDOCRINOLOGY**

- **AUTOIMMUNE THYROID DISEASE**
  - **Thyroid Peroxidase (TPO)**
    - A01309H Rec. Ag >95%
  - **Thyroglobulin (TG)**
    - H6T08-275 Native Ag (Human Thyroid Tissue) >99%