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| **Supplementary Table 4.** irAEs associated with autoantibodies-mediated ICIs. |
| **ICIs** | **Source** | **irAE** | **Antibody specificity** | **PMID** | **REF** |
| **Anti-CTLA-4** |  |
| Ipilimumab | P | Vasculitis neuropathy | ANCA: anti-MPO and anti-PR3  | 31209477 | (1) |
| Ipilimumab | A | Thyroid dysfunction | Anti-TPO and anti-TG | 30425107 | (2) |
| Anti-CTLA-4 | P | Autoimmune hepatitis | Anti-DNA | 17508005 | (3) |
| Tremelimumab | P | Encephalomyeloradiculopathy | Anti-Ma1 and anti-Ma2  | 25661887 | (4) |
| Ipilimumab or Pembrolizumab | P | Hypophysitis | ZCCHC8 common antibodies: GGA2, RBM34, MPG, LCP1, ACVR2B,TEC,MRPS18A, RPUSD2, among others | 32671216 | (5) |
| Ipilimumab or anti-PD-1 (pembrolizumab and nivolumab) | P | Insulin-dependent diabetes | Anti-GAD65 | 30899528 | (6) |
| Ipilimumab or Nivolumab or Ipilimumab + Nivolumab | P | Inflammatory arthritis and sicca syndrome | Anti-nuclear antibodies | 27307501 | (7) |
| Ipilimumab+ Nivolumab | P | Hypoparathyroidism | Anti-CaSR | 32581059 | (8) |
| Ipilimumab+ Nivolumab | P | Retinopathy  | Anti-retinal | 31246886 | (9) |
| Ipilimumab+ Nivolumab | P | Hypothyroidism | Anti-TPO, anti-TG | 29862971 | (10) |
| Ipilimumab+ Nivolumab | P | Autoimmune Encephalitis  | Anti-N-methyl-D-aspartate receptor | 27271951 | (11) |
| **Anti-PD-1** |  |
| Nivolumab | P | Type 1 diabetes mellitus  | Pancreatic islet-related autoantibody-negative t1dm | 30853818 | (12) |
| Nivolumab | P | Autoimmune Diabetes and Thyroiditis | Anti-GAD and anti-TPO | 28611636 | (13) |
| Nivolumab | P | Autoimmune diabetes | Anti-GAD-65, anti-TPO, insulin autoantibody | 28515940 | (14) |
| Nivolumab | P | Diabetes Mellitus | IA-2Ab antibodies | 31708539 | (15) |
| Nivolumab | P | Bullous pemphigoid | BP 180 antibodies and C-terminal domains and LAD-1 | 28865162, 31570332 | (16), (17) |
| Nivolumab | P | Cerebellar type of Hashimoto's encephalopathy  | Anti-thyroid antibodies | 31462589 | (18) |
| Nivolumab | P | Autoimmune disorders | within 30 days of >1AAbs among ANAs, ENAs and ASMAs | 31289683 | (19) |
| Nivolumab | P | Hypoparathyroidism | Anti-CaSR | 30252069 | (20) |
| Nivolumab | P | Kidney injury | Anti-glomerular basement membrane | 30032835 | (21) |
| Nivolumab | P | Limbic Encephalitis | Anti-Hu | 29857970 | (22) |
| Nivolumab | P | Thrombocytopenia and hypothyroidism | Anti-TPO and anti-TG | 29260625 | (23) |
| Nivolumab | P | **Myositis /atrioventricular block**  | PL-12-B (alanyl-tRNA snythetase antibodies) and anti-SRP-B | 27977496 | (24) |
| Nivolumab | P | ***Myasthenia gravis and myopathy*** | Anti-titin antibody | 31243249 | (25) |
| Nivolumab | P | ***Myasthenia gravis and myopathy*** | Acetylcholine receptor antibody | 31436031 | (26) |
| Nivolumab | P | ***Myasthenia gravis*** | Anti-AChR | 26491202 | (27) |
| Nivolumab | P | Autoimmune encephalitis  | Ma2 antibodies | 32303632 | (28) |
| Nivolumab | P | Dermatomyositis | anti-transcriptional intermediary factor 1-γ (anti-TIF1-γ) antibodies | 32651759 | (29) |
| Nivolumab | P | thyroid dysfunction | antithyroglobulin antibodies | 30230649 | (30) |
| Nivolumab | P | Hypoparathyroidism | Anti- calcium-sensing receptor (CaSR) | 30252069 | (20) |
| Nivolumab | P | Encephalopathy  | Hu autoantibodies | 28577954 | (31) |
| Nivolumab | P | thrombocytopenia and hypothyroidism | thyroglobulin and thyroid peroxidase antibodies | 29260625 | (23) |
| Nivolumab | P | Type 1 diabetes mellitus | Anti-glutamic acid decarboxylase antibodies (GADA) and thyroid autoantibodies | 33786278 | (32) |
| Nivolumab | P | Cerebral vasculitis | Anti-nuclear antibodies | 28642817 | (33) |
| Nivolumab | P | myasthenia gravis and rhabdomyolysis | Acetylcholine receptor binding antibodies | 26491202 | (27) |
| Nivolumab | P | Limbic Encephalitis  | Anti-Hu Antibody | 29857970 | (22) |
| Pembrolizumab | P | ***Myasthenia gravis with myositis and myocarditis*** | Antibodies to striated muscle and Anti-AChR | 30528803\* | (34) |
| Pembrolizumab | P | ***Myasthenia gravis and myositis*** | Anti-AChR and anti-titin | 31341124 | (35) |
| Pembrolizumab | P | ***Myositis*** | Anti-AChR, anti-striated muscle: anti-titin and anti-Kv1.4. | 31323130 | (36) |
| Pembrolizumab | P | Ocular Myasthenia Gravis | Anti-titin | 30713313 | (37) |
| Pembrolizumab | P | General autoimmunity  | Anti-AChRs, anti-TG, anti-TPO, striated muscles, and mitochondrial | 32442551 | (38) |
| Pembrolizumab | P | Hypoparathyroidism | Anti-CaSR | 32112105 | (39) |
| Pembrolizumab | P | Thyroid dysfunction | Anti-TPO and/or TRAb | 27571185 | (40) |
| Pembrolizumab | P | Atypical skin toxicities | Anti-desmoplakin 1 and 2, and anti-desmoglein 1 and 3  | 27482939 | (41) |
| Pembrolizumab | P | Taxic sensory neuronopathy (SNN) | Anti-ANA, anti-SSA | 30348223 | (42) |
| Pembrolizumab | P | Bullous pemphigoid  | Anti-BP180 | 28677843 | (43) |
| Pembrolizumab | P | Glomerulonephritis  | Anti-neutrophil cytoplasmic | 28342816 | (44) |
| Pembrolizumab | P | Autoimmune limbic encephalitis | Anti-CASPR2 | 28284337 | (45) |
| Pembrolizumab | P | bullous pemphigoid | anti-BMZ antibodies | 33184934 | (46) |
| Pembrolizumab | P | Neuromyelitis optica spectrum disorder (NMOSD) | anti-aquaporin-4 antibody (AQP4-Ab) | 31655267 | (47) |
| Pembrolizumab | P | myositis with dropped head syndrome | anti-titin antibody | 32914675 | (48) |
| anti-PD-1 | P | Autoimmune diabetes | Anti-GAD | 31265074 | (49) |
| anti-PD-1 | P | Cerebral vasculitis/encephalitis | Vascular endothelial antibodies. | 28642817 | (33) |
| anti-PD-1 | P | Bullous pemphigoid | Anti-LAD-1 | 31474998 | (50) |
| Nivolumab, Pembrolizumab | P | ***Myasthenia Gravis and Myositis*** | Anti-striational  | 32381950 | (51) |
| Nivolumab, Pembrolizumab | P | Sí | Anti-C1GALT1 | 32427353 | (52) |
| Nivolumab, Pembrolizumab | P | Thyroid dysfunction | Anti-TG and anti-TPO | 31093955 | (53) |
| Nivolumab or pembrolizumab, Ipilimumab, or Ipilimumab + Nivolumab. | P | Thyroid dysfunctions | Thyroid autoantibodies  | 32086984 | (54) |
| Nivolumab, pembrolizumab, ipilimumab+nivolumab, ipilimumab+durvalumab, or atezolizumab. | P | Peripheral neuropathy | Anti-Ma2, anti-glial fibrillar acidic protein andante-contactin-associated protein-like 2 | 32312871 | (55) |
| Ipilimumab+Nivolumab | P | Cerebellar toxicity | anti-Zic4 antibody | 32943444 | (56) |
| **Anti-PD-L1** |  |
| Durvalumab | P | ***Myositis***  | Anti-3-hydroxy-3-methylglutaryl-coenzyme A reductase antibody | 32400023 | (57) |
| Durvalumab | P | Sjögren's syndrome | Anti-SSA | 32300556 | (58) |
| Durvalumab | P | Diabetic ketoacidosis  | Anti-GAD | 31829972 | (59) |
| Durvalumab | P | Autoimmune diabetes with severe diabetic ketoacidosis and immune-related thyroiditis | glutamic acid decarboxylase (GAD65) | 33209634 | (60) |
| Atezolizumab. | P | Diabetic ketoacidosis | Anti-GAD | 28978581 | (61) |
| Atezolizumab | P | Type 1 diabetes | Anti‐GAD autoantibody, and anti‐islet antigen 2 autoantibody | 31282610 | (62) |
| Nivolumab, Duvalumab | P | Bullous Skin  | Anti-BP180 and BP230 | 26928461 | (63) |
| Anti-PD-1 and anti-CTLA-4 | P | Encephalitis | Anti-Ma2 | 31345342 | (64) |

ANCA: Antineutrophil cytoplasmic antibodies, MPO: Myeloperoxidase, PR3: Proteinase 3, TPO: Thyroid peroxidase, TG: anti-thyroglobulin, ZCCHC8: zinc finger CCHC-type containing 8, GGA2: Golgi Associated, Gamma Adaptin Ear Containing, ARF Binding Protein 2, RBM34: RNA Binding Motif Protein 34, MPG: N-methylpurine DNA glycosylase, LCP: lymphocyte cytosolic protein 1, ACVR2B : Activin Receptor Type IIB, TEC: tec protein tyrosine kinase, MRPS18A :mitochondrial ribosomal protein S18A, RPUSD2: RNA pseudouridylate synthase domain containing 2, GAD65: glutamic acid decarboxylase 65, CaSR: constitutive androstane receptor, IA2b: Islet antigen 2b, LAD1: ladinin-1, ANA: AntiNuclear Antibodies, ENA: Extractable Nuclear Antigen, ASMAs: Anti-smooth muscle antibodies, anti-Hu: antineuronal nuclear antibody-type 1, SRP-B: signal recognition particle, AChR: Acetylcholine receptor, Kv1.4: Potassium Channel 1.4, TRAb: TSH receptor antibodies, SSA:Sjögren's-syndrome-related antigen A, BP180: Collagen XVII, CASPR2: contactin-associated protein 2, C1GALT1: Core 1 Synthase, Glycoprotein-N-Acetylgalactosamine 3-Beta-Galactosyltransferase 1, BP230: dystonin. Diseases shown in italics and bold represent those diseases to heart dysfunction.

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