Disease	mutation
Type 1 diabetes	1.HLA-DR3, DR-4, DQ8 2.Polymorphism in CTLA4 and PTPN22 genes (similar to autoimmune thyroiditis)
Type 2 diabetes	Genes related to adipose-tissue distribution in body, B-cell function and obesity
Monogenic form of DM	1.germline loss of function mutation in glucokinase (GCK) genes 2. ▪ Rarely: mutation is insulin-receptor synthesis, binding or activity
Primary adrenal adenoma	PRKAR1A genetic mutation
Adrenal carcinoma	activation of beta-catenin (CTNNB1), inactivation of TP53, MEN1 and PRKAR1A
Primary adrenal hyperplasia: 1. Familial disease 2. Sporadic disease 3. Syndromic disease	1. inherited mutation in the tumor suppressor gene: armadillo repeat containing 5 (ARMC5) 2. 50% show ARNC5 mutation, others show ectopic production of G-protein coupled hormone receptors 3. germline activating mutation in GNAS
Micronodular bilateral adrenal hyperplasia	mutation in cAMP-dependent protein kinase (PRKAR1A gene),
Bilateral idiopathic hyperaldosteronism	Germline mutation in KCNJ5
Adrenocortical neoplasm	50% harbor KCNJ5 mutation, which encodes potassium channel on zona granulosa cells (called GIRK4 protein)
Familial hyperaldosteronism	mutation in CYP11B2 (encoding aldosterone synthase)
Congenital adrenal hyperplasia	mutation in CYP21A1 gene
pheochromocytoma	Genetic mutations in growth-factor receptor pathway genes (RET, NF1)