

# Genes to know in migraine genetics



Recent advances in migraine research have provided insights into many contributing genetic factors implicated in migraine—including rare monogenic types to more common polygenic forms.

Type of migraine	Genetic locus*	Gene function or implicated biological process(es)
<input checked="" type="checkbox"/> Familial hemiplegic migraine (monogenic)	FHM1 <i>CACNA1A</i> <sup>1</sup>	Ion homeostasis-regulation <sup>1</sup>
	FHM2 <i>ATP1A2</i> <sup>1</sup>	
	FHM3 <i>SCN1A</i> <sup>1</sup>	
<input checked="" type="checkbox"/> Common migraine (non-familial, polygenic)	<i>KCNK5</i> <sup>2</sup> <i>TRPM8</i> <sup>2,3</sup> <i>SLC24A3</i> <sup>2</sup>	Ion channels or ion homeostasis <sup>2</sup>
	<i>REST</i> <sup>2,t</sup> <i>YAP1</i> <sup>2</sup> <i>PRDM16</i> <sup>2,3</sup>	Nitric oxide signaling and oxidative stress <sup>2</sup>
	<i>PHACTR1</i> <sup>2,3</sup> <i>TGFBR2</i> <sup>2,3,t</sup> <i>RNF213</i> <sup>2</sup> <i>JAG1</i> <sup>2,t</sup>	Previous associations to vascular disease or regulation <sup>2</sup>
	<i>TSPAN2</i> <sup>2,3,t</sup> <i>FHL5</i> <sup>2,3</sup> <i>C7orf10</i> <sup>2,3</sup> <i>MEF2D</i> <sup>2,3</sup> <i>ASTN2</i> <sup>2,3</sup> <i>AJAP1</i> <sup>3,t</sup> <i>MMP16</i> <sup>3,t</sup> <i>FGF6</i> <sup>3,t</sup> <i>PLCE1</i> <sup>2</sup> <i>HPSE2</i> <sup>2</sup> <i>CFDP1</i> <sup>2</sup> <i>GPR149</i> <sup>2,t</sup>	Other biological processes or unknown
	<i>ITPK1</i> <sup>2,t</sup> <i>GJA1</i> <sup>2,t</sup>	
	<i>LRP1</i> <sup>2,3</sup> <i>MRVI2</i>	
	<i>HEY2</i> <sup>2</sup> <i>ARMS2</i> <sup>2</sup> <i>NRP12</i>	
	<i>ZCCHC14</i> <sup>2,t</sup> <i>WSCD1/NLRP1</i> <sup>2,t</sup> <i>ADAMTSL4/ECM1</i> <sup>2,t</sup> <i>CCM2L/HCK</i> <sup>2,t</sup> <i>MED14/USP9X</i> <sup>2,t</sup> <i>DOCK4/IMMP2L</i> <sup>2,t</sup> <i>1p31.1</i> <sup>2</sup> <i>CARF</i> <sup>2</sup> <i>ICSF9B</i> <sup>2</sup> <i>MPPED2</i> <sup>2</sup> <i>NOTCH4</i> <sup>2,t</sup>	

\*Green: Confirmed causal gene; Black: Putatively implicated through two recent meta-analyses of genome-wide association studies and requires further studies for confirmation.<sup>2,3</sup> †Nearest gene to the index single nucleotide polymorphism (SNP) locus.

1. Anttila V, Wessman M, Kallela M, Palotie A. Genetics of migraine. *Handb Clin Neurol* 2018;148:493–503. 2. Gormley P, Anttila V, Winsvold BS, et al. Meta-analysis of 375,000 individuals identifies 38 susceptibility loci for migraine. *Nat Genet* 2016;48(8):856–66. 3. Anttila V, Winsvold BS, Gormley P, et al. Genome-wide meta-analysis identifies new susceptibility loci for migraine. *Nat Genet* 2013;45(8):912–7.