We have over 20,000 different genes in the body. These genes are like instruction manuals for how to build a protein, and each protein has an important function that helps to keep our body working how it should. The *PKP2* gene makes a protein called plakophilin 2. Our body is made up of billions of cells. Plakophilin 2 helps to make structures called desmosomes, which work to hold cells together. By doing this, they stabilize and strengthen the various different tissues that make up our bodies. Desmosomes can also help with communication within the cell. This communication helps to tell the cell when it's time to divide to make more new cells, or when it's time for that cell to die, which are both very important.

If someone has a harmful change (called a pathogenic variant) in one of their *PKP2* genes, then their body does not make as much plakophilin 2 protein as it should. If there is not enough plakophilin 2 protein, then cells do not have as strong of a bond. This leads to a higher rate of cell death and damage because the connections between cells are not as durable. Because desmosomes help with cell communication, not having enough of them can also mean that these messages do not get delivered, which can further contribute to cell death.

This progressive cell death is what can lead to the damage in the heart muscles, which can lead to health issues, such as arrhythmogenic right ventricular cardiomyopathy.

Pathogenic variants in the *PKP2* gene are passed through the family in an autosomal dominant pattern, meaning that anyone who carries the variant has a 50% chance to pass it down to any children they have. Women and men both have the *PKP2* gene and have the same chances to inherit and pass down pathogenic variants.

Genetic Testing for *PKP2*

Genetic testing for pathogenic variants in *PKP2* is currently available, but there are a few different ways to approach testing:

- *Single site analysis*: Testing specific to a known pathogenic variant in the family
- Full gene sequencing and rearrangement analysis: Comprehensive testing to search for all currently detectable pathogenic variants in the gene
- Gene panels: Newer, more broadly based gene tests that would include not only the *PKP2* gene, but other genes known or suspected to be associated with hereditary cardiovascular disease.

Click here to learn more about scheduling a genetic counseling appointment for questions

about pediatric or adult genetic conditions.