PKHD1 gene
PKHD1, fibrocystin/polyductin

Normal Function

The *PKHD1* gene provides instructions for making a protein called fibrocystin (sometimes known as polyductin). This protein is present in fetal and adult kidney cells, and is also present at low levels in the liver and pancreas.

Fibrocystin spans the cell membrane of kidney cells, so that one end of the protein remains inside the cell and the other end projects from the outer surface of the cell. Based on its structure, fibrocystin may act as a receptor, interacting with molecules outside the cell and receiving signals that help the cell respond to its environment. This protein also may be involved in connecting cells together (adhesion), keeping cells apart (repulsion), and promoting the growth and division of cells (proliferation).

Fibrocystin is also found in cell structures called primary cilia. Primary cilia are tiny, fingerlike projections that line the small tubes where urine is formed (renal tubules). Researchers believe that primary cilia play an important role in maintaining the size and structure of these tubules; however, the function of fibrocystin in primary cilia remains unclear.

Health Conditions Related to Genetic Changes

Polycystic kidney disease

More than 270 mutations in the *PKHD1* gene have been identified in people with polycystic kidney disease. These mutations cause autosomal recessive polycystic kidney disease (ARPKD), which is a severe type of the disorder that is usually evident at birth or in early infancy. *PKHD1* mutations include changes in single DNA building blocks (base pairs) and insertions or deletions of a small number of base pairs in the gene. These mutations disrupt the normal structure and function of the fibrocystin protein, or lead to the production of an abnormally small, nonfunctional version of the protein. Researchers have not determined how these genetic changes lead to the formation of numerous cysts characteristic of polycystic kidney disease.
**Chromosomal Location**

Cytogenetic Location: 6p12.3-p12.2, which is the short (p) arm of chromosome 6 between positions 12.3 and 12.2

Molecular Location: base pairs 51,614,685 to 52,087,625 on chromosome 6 (Homo sapiens Updated Annotation Release 109.20200522, GRCh38.p13) (NCBI)

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**Other Names for This Gene**

- FCYT
- fibrocystin
- PKHD1_HUMAN
- polycystic kidney and hepatic disease 1 (autosomal recessive)
- polyductin
- TIGM1
- tigmin

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**Additional Information & Resources**

**Clinical Information from GeneReviews**

- Polycystic Kidney Disease, Autosomal Recessive
  https://www.ncbi.nlm.nih.gov/books/NBK1326

**Scientific Articles on PubMed**

- PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28%28PKHD1%5BTIAB%5D%29+OR+%28polycystic+kidney+and+hepatic+disease+1%5BTIAB%5D%29+OR+%28FCYT%5BTIAB%5D%29+OR+%28ARPKD%5BTIAB%5D%29+OR+%28polyductin%5BTIAB%5D%29+OR+%28TIGM1%5BTIAB%5D%29+OR+%28tigmin%5BTIAB%5D%29+AND+%28Genes%5BMH%5D%29+OR+%28Genetic+Phenomena%5BMH%5D%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+1440+days%22%5Bdp%5D
Catalog of Genes and Diseases from OMIM

- **PKHD1 CILIARY IPT DOMAIN-CONTAINING FIBROCYSTIN/POLYDUCTIN**
  http://omim.org/entry/606702

Research Resources

- **Atlas of Genetics and Cytogenetics in Oncology and Haematology**
  http://atlasgeneticsoncology.org/Genes/GC_PKHD1.html
- **ClinVar**
  https://www.ncbi.nlm.nih.gov/clinvar?term=PKHD1%5Bgene%5D
- **HGNC Gene Symbol Report**
- **Monarch Initiative**
  https://monarchinitiative.org/gene/NCBIGene:5314
- **Mutation Database, Autosomal Recessive Polycystic Kidney Disease (Aachen University, Germany)**
  http://www.humgen.rwth-aachen.de/
- **NCBI Gene**
- **UniProt**
  https://www.uniprot.org/uniprot/P08F94

Sources for This Summary

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  Free article on PubMed Central: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1736033/  

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Reviewed: June 2006  
Published: June 23, 2020  

Lister Hill National Center for Biomedical Communications  
U.S. National Library of Medicine  
National Institutes of Health  
Department of Health & Human Services