



## ABCC2 gene

ATP binding cassette subfamily C member 2

### Normal Function

The *ABCC2* gene provides instructions for producing a protein called multidrug resistance protein 2 (MRP2). This protein is one of a family of multidrug resistance proteins involved in the transport of substances out of cells. MRP2 is primarily found in the liver, with smaller amounts in the kidneys, intestine, and placenta.

MRP2 transports a variety of substances out of cells. For example, MRP2 clears certain drugs from organs and tissues, playing a part in drug metabolism. Drug metabolism involves the breakdown of drugs into different chemical components allowing the drugs to have their intended effects and eventually be eliminated from the body. MRP2 also transports a substance called bilirubin out of liver cells and into bile (a digestive fluid produced by the liver). Bilirubin is produced during the breakdown of old red blood cells and has an orange-yellow tint.

### Health Conditions Related to Genetic Changes

#### Dubin-Johnson syndrome

More than 30 mutations in the *ABCC2* gene have been found to cause Dubin-Johnson syndrome. Most of these mutations change single protein building blocks (amino acids) in MRP2. One mutation is most common among Iranian Jews living in Israel; this mutation replaces the amino acid isoleucine with the amino acid phenylalanine at position 1173 in MRP2 (written as Ile1173Phe or I1173F). Another mutation is seen more frequently among Israel's Moroccan-Jewish population; it replaces the amino acid arginine with the amino acid histidine at position 1150 in MRP2 (written as Arg1150His or R1150H).

*ABCC2* gene mutations that cause Dubin-Johnson syndrome have a variety of effects on the structure and function of MRP2. Mutations may alter how the protein is made, impair transport of the protein to the cell surface, or cause the protein to be broken down too quickly. A lack of functional MRP2 disrupts the excretion of bilirubin from the body. A buildup of bilirubin causes yellowing of the skin and whites of the eyes (jaundice) in people with Dubin-Johnson syndrome.

#### cancers

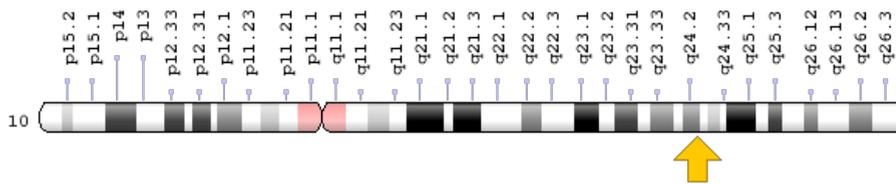
Research has shown that the *ABCC2* gene is abnormally active (overexpressed) in many types of cancer cells. Increased gene activity means that more MRP2 is produced, which can cause a problem for people receiving drug treatments for

cancer. The excess MRP2 may transport certain anticancer drugs out of cancer cells before they can have their intended effect. Cancer cells with too much MRP2 can become resistant to anticancer drugs. This effect has been shown in many different types of cancers with multiple anticancer drugs.

## Chromosomal Location

Cytogenetic Location: 10q24.2, which is the long (q) arm of chromosome 10 at position 24.2

Molecular Location: base pairs 99,782,598 to 99,853,741 on chromosome 10 (Homo sapiens Annotation Release 108, GRCh38.p7) (NCBI)



Credit: Genome Decoration Page/NCBI

## Other Names for This Gene

- ATP-binding cassette, sub-family C (CFTR/MRP), member 2
- canalicular multispecific organic anion transporter
- CMOAT
- cMRP
- MRP2
- MRP2\_HUMAN

## Additional Information & Resources

### Educational Resources

- Cancer Medicine (sixth edition, 2003): Multidrug Resistance Protein Family <https://www.ncbi.nlm.nih.gov/books/NBK13169/#A11397>
- The Human ATP-Binding Cassette (ABC) Transporter Superfamily: ABCC Genes <https://www.ncbi.nlm.nih.gov/books/NBK3/#A191>

### Genetic Testing Registry

- GTR: Genetic tests for ABCC2 <https://www.ncbi.nlm.nih.gov/gtr/all/tests/?term=1244%5Bgeneid%5D>

### Scientific Articles on PubMed

- PubMed  
<https://www.ncbi.nlm.nih.gov/pubmed?term=%28%28ABCC2%5BTI%5D%29+OR+%28MRP2%5BTI%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+720+days%22%5Bdp%5D>

### OMIM

- ATP-BINDING CASSETTE, SUBFAMILY C, MEMBER 2  
<http://omim.org/entry/601107>

### Research Resources

- Atlas of Genetics and Cytogenetics in Oncology and Haematology  
[http://atlasgeneticsoncology.org/Genes/GC\\_ABCC2.html](http://atlasgeneticsoncology.org/Genes/GC_ABCC2.html)
- ClinVar  
<https://www.ncbi.nlm.nih.gov/clinvar?term=ABCC2%5Bgene%5D>
- HGNC Gene Family: ATP binding cassette subfamily C  
<http://www.genenames.org/cgi-bin/genefamilies/set/807>
- HGNC Gene Symbol Report  
[http://www.genenames.org/cgi-bin/gene\\_symbol\\_report?q=data/hgnc\\_data.php&hgnc\\_id=53](http://www.genenames.org/cgi-bin/gene_symbol_report?q=data/hgnc_data.php&hgnc_id=53)
- NCBI Gene  
<https://www.ncbi.nlm.nih.gov/gene/1244>
- UniProt  
<http://www.uniprot.org/uniprot/Q92887>

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