



SGO1 gene

shugoshin 1

Normal Function

The *SGO1* gene provides instructions for making part of a protein complex called cohesin. This protein complex helps control the placement of chromosomes during cell division. Before cells divide, they must copy all of their chromosomes. The copied DNA from each chromosome is arranged into two identical structures, called sister chromatids, which are attached to one another during the early stages of cell division. Cohesin holds the sister chromatids together, and in doing so helps maintain the stability of chromosomal structure during cell division.

Health Conditions Related to Genetic Changes

Chronic atrial and intestinal dysrhythmia

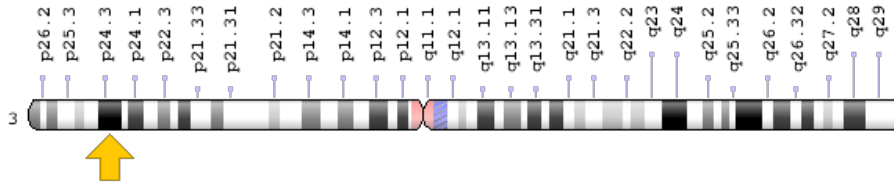
At least one *SGO1* gene mutation has been identified in people with chronic atrial and intestinal dysrhythmia (CAID), a disorder affecting the normal rhythmic movements of the heart and the digestive system. The *SGO1* gene mutation that causes CAID replaces a protein building block (amino acid) called lysine with the amino acid glutamic acid at protein position 23, written as Lys23Glu or K23E. Researchers suggest that the mutation may result in a cohesin complex that is less able to hold sister chromatids together, resulting in decreased chromosomal stability during cell division. This instability is thought to cause early aging (senescence) of cells in the intestinal muscle and in the heart's natural pacemaker (the sinoatrial node), resulting in problems maintaining proper rhythmic movements of the heart and intestines and leading to the signs and symptoms of CAID.

It is unclear why *SGO1* gene mutations specifically affect the heart and intestines in CAID. Researchers suggest that the activity (expression) of the *SGO1* gene in certain embryonic tissues or a particular function of the *SGO1* protein in the sinoatrial node and in cells that help control the rhythm of intestinal movements may account for the features of the disorder.

Chromosomal Location

Cytogenetic Location: 3p24.3, which is the short (p) arm of chromosome 3 at position 24.3

Molecular Location: base pairs 20,160,593 to 20,188,143 on chromosome 3 (Homo sapiens Updated Annotation Release 109.20190607, GRCh38.p13) (NCBI)



Credit: Genome Decoration Page/NCBI

Other Names for This Gene

- hSgo1
- NY-BR-85
- serologically defined breast cancer antigen NY-BR-85
- SGO
- Sgo1
- SGOL1
- SGOL1_HUMAN
- shugoshin-like 1
- shugoshin-like 1 (*S. pombe*)

Additional Information & Resources

Educational Resources

- Molecular Biology of the Cell (fourth edition, 2002): Cohesins and Condensins Help Configure Replicated Chromosomes for Segregation
<https://www.ncbi.nlm.nih.gov/books/NBK26931/#A3334>

Scientific Articles on PubMed

- PubMed
<https://www.ncbi.nlm.nih.gov/pubmed?term=%28SGOL1%5BTIAB%5D%29+OR+%28%28NY-BR-85%5BTIAB%5D%29+OR+%28SGO%5BTIAB%5D%29+OR+%28Sgo1%5BTIAB%5D%29+OR+%28hSgo1%5BTIAB%5D%29%29+AND+%28%28Genes%5BMH%5D%29+OR+%28Genetic+Phenomena%5BMH%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+1440+days%22%5Bdp%5D>

Catalog of Genes and Diseases from OMIM

- SHUGOSHIN-LIKE 1
<http://omim.org/entry/609168>

Research Resources

- Atlas of Genetics and Cytogenetics in Oncology and Haematology
<http://atlasgeneticsoncology.org/Genes/SGOL1ID50710ch3p24.html>
- ClinVar
<https://www.ncbi.nlm.nih.gov/clinvar?term=SGO1%5Bgene%5D>
- HGNC Gene Symbol Report
https://www.genenames.org/data/gene-symbol-report/#!/hgnc_id/HGNC:25088
- Monarch Initiative
<https://monarchinitiative.org/gene/NCBIGene:151648>
- NCBI Gene
<https://www.ncbi.nlm.nih.gov/gene/151648>
- UniProt
<https://www.uniprot.org/uniprot/Q5FBB7>

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<https://ghr.nlm.nih.gov/gene/SGO1>

Reviewed: May 2015

Published: September 10, 2019

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