

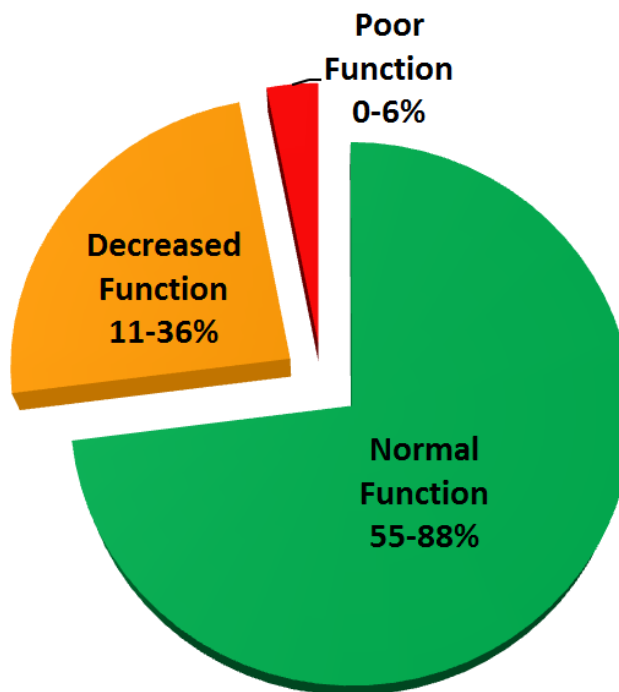
Things To Remember:

- ⇒ *SLCO1B1* regulates the amount of simvastatin removed from the body.
- ⇒ Some *SLCO1B1* forms, caused by changes in the gene, may reduce the amount of simvastatin removed from the body leading to increased risk of drug-related muscle damage.
- ⇒ Other medications may also affect your response to simvastatin. Therefore, it is important to let your physician know all the medications that you are taking so that any potential interactions may be avoided.

Glossary

- ⇒ **Active drug:** the form of drug which produces an effect after it enters the body
- ⇒ **Enzyme:** a protein that breaks down a drug
- ⇒ **General population:** a group of people made up of different races/ethnicities
- ⇒ **Metabolism:** the breakdown of a drug
- ⇒ **Prodrug:** the inactive form of a drug which needs to be activated in the body before it can produce the desired effect.

Breakdown Of *SLCO1B1* Protein Transporter Activity In The General Population



"One size does not fit all."

Translational Initiatives for Pharmacogenomics
The Charles Bronfman Institute for Personalized Medicine

Icahn School of Medicine
at Mount Sinai
P.O. Box 1003
New York, NY 10029
Phone: 212-241-7371
Fax: 212-849-2643



*The Charles Bronfman
Institute for Personalized
Medicine*

Translational Initiatives in
Pharmacogenomics

TIP



Simvastatin and *SLCO1B1*



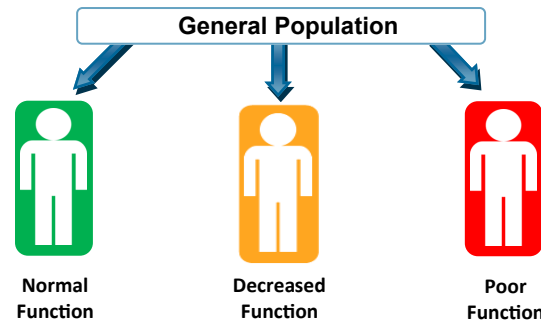
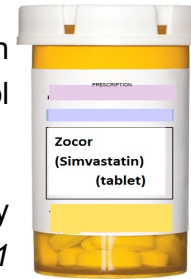
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Pharmacogenetics: *SLCO1B1*

- ◆ Pharmacogenetics is the study of how your genes affect the medications you take.
- ◆ Genes are the instruction manuals contained in each person's body.
- ◆ The instructions the body receives from the genes are what control how we look, how to grow, and how we function.
- ◆ They also contain instructions for how to make enzymes, which are proteins the body use to break down or "metabolize" what we take in, including medications.
- ◆ Changes in some genes may result in different instructions for how to make the enzymes. This could result in the body having a different form of the enzyme that may break down medications differently.
- ◆ *SLCO1B1* is a protein transporter that is responsible for clearing simvastatin from the body. Changes in the *SLCO1B1* gene lead to different forms of the *SLCO1B1* protein; which affects the way your body removed simvastatin from the body.

Simvastatin (Zocor®)

- ◆ Simvastatin is a medication used for reducing cholesterol levels in the body.
- ◆ Its concentration in the body is regulated by *SLCO1B1* transporter protein.
- ◆ Changes in *SLCO1B1* can lead to reduced amount of simvastatin removed from the body. This can lead to increased risk of muscle damage.



Personalized Medicine at Mount Sinai

- ◆ The *SLCO1B1* genetic test provides information that helps to predict the risk of muscle damage in patients beginning simvastatin.
- ◆ In Mount Sinai's pharmacogenetics program, your genetic test results including your *SLCO1B1* results are added to the electronic medical records.
- ◆ If you have a **decreased function** or a **poor function** in *SLCO1B1*, your doctor will receive an alert when prescribing simvastatin for you.
- ◆ This alert will tell the doctor to lower the dose of simvastatin or change to another medication. (see table below).

Table: *SLCO1B1* transporter protein forms and their effects on the risk of muscle damage

Classification	Protein Activity	Clinical Relevance
Normal Function	Simvastatin is removed from the body normally	Normal risk of muscle damage
Decreased Function	Reduced amount of simvastatin is removed from the body	Moderate risk of muscle damage
Poor Function	Very little amount of simvastatin is removed from the body	High risk of muscle damage