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.

**“One size does not fit all.”**

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

- **Normal Function**: 55-88%
- **Decreased Function**: 11-36%
- **Poor Function**: 0-6%
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.

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

<table>
<thead>
<tr>
<th>Classification</th>
<th>Protein Activity</th>
<th>Clinical Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Function</td>
<td>Simvastatin is removed from the body normally</td>
<td>Normal risk of muscle damage</td>
</tr>
<tr>
<td>Decreased Function</td>
<td>Reduced amount of simvastatin is removed from the body</td>
<td>Moderate risk of muscle damage</td>
</tr>
<tr>
<td>Poor Function</td>
<td>Very little amount of simvastatin is removed from the body</td>
<td>High risk of muscle damage</td>
</tr>
</tbody>
</table>

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).