

# OSMR Gene

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## 1. Introduction

The *OSMR* gene provides instructions for making a protein called oncostatin M receptor beta subunit (OSMR $\beta$ ). This protein is one piece (subunit) of both the oncostatin M (OSM) receptor type II and the interleukin-31 (IL-31) receptor. These receptors are embedded in the cell membrane of many types of cells throughout the body. Each attaches to a particular protein, fitting together like a lock and its key. This attachment triggers a series of chemical signals inside the cell that directs certain cell functions.

OSM receptor type II interacts with a protein called oncostatin M (OSM). Signaling triggered by OSM was first recognized to block the growth of cancerous cells and appears to play a role in many other body processes, including the development of blood cells, the maturation of cells to become certain cell types, and an immune system response called inflammation. The signaling may also block the self-destruction (apoptosis) of cells.

The IL-31 receptor interacts with a protein called IL-31. Signaling triggered by IL-31 is involved in inflammation and stimulating itching (pruritus), although its role is not completely understood.

## 2. Health Conditions Related to Genetic Changes

### 2.1. Primary localized cutaneous amyloidosis

At least 13 mutations in the *OSMR* gene have been found to cause primary localized cutaneous amyloidosis (PLCA) type 1, an itchy skin condition in which clumps of abnormal proteins called amyloids build up in the skin. These mutations change single protein building blocks (amino acids) in OSMR $\beta$ . Most alter a region of the protein thought to interact with the other subunit of the OSM receptor type II or the IL-31 receptor and may impair formation of these receptors.

*OSMR* gene mutations reduce the chemical signals triggered by OSM and IL-31. Researchers speculate that this reduced signaling may make cells more likely to undergo apoptosis. Some studies suggest that apoptosis of skin cells releases abnormal proteins that form amyloids. It has been suggested that apoptosis is triggered by scratching the itchy skin, but the role of *OSMR* gene changes in skin itching is not clear.

## 3. Other Names for This Gene

- IL-31 receptor subunit beta
  - IL-31R subunit beta
  - IL-31R-beta
  - IL-31RB
  - interleukin-31 receptor subunit beta
  - oncostatin-M specific receptor beta subunit
  - OSMRB
  - PLCA1
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