Atlas of Genetics and Cytogenetics in Oncology and Haematology

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# Gene Section
## Mini Review

# GPR68 (G protein-coupled receptor 68)

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## Identity

**Other names:** GPR12A; MGC111379; MGC156983; OGR-1; OGR1

**HGNC (Hugo):** GPR68

**Location:** 14q32.12

**Note:** GPR68 (OGR1) is a G protein-coupled receptor (GPCR), which share high homology with other three GPCRs (TDAG8, G2A and GPR4). OGR1, as well as TDAG8, G2A and GPR4, has been shown to be proton-sensing GPCRs. In particular, OGR1 has been shown to be a proton-sensing receptor in bone. OGR1 is expressed in osteoclasts and osteoblasts, where it mediates acid-induced signaling pathways via G(q/11) protein, phospholipase C, IP(3) formation, and subsequent $Ca^{2}+$ release from thapsigargin-sensitive stores. Acidic pH has been shown to induce cyclooxygenase-2 (COX-2) induction and prostaglandin E2 (PGE2) production, resulting in stimulation of bone calcium release and osteoclastogenesis. OGR1 family receptors can also mediate effects of several phospholipids. However, whether the lipid regulation is specific to these receptors is still under debate.

## DNA/RNA

**Note**

GPR68 (OGR1) is a proton sensing receptor. Its physiological role need to be further investigated.

### *Description*

The open reading frame of GPR68 is encoded by a single exon (1095 bp) located at chromosome 14q31.

### *Transcription*

GPR68 transcripts of ~3.0 kb in human.

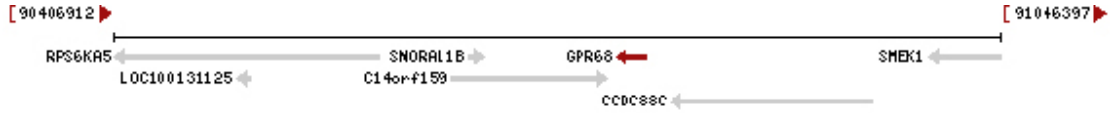
## Protein

### *Description*

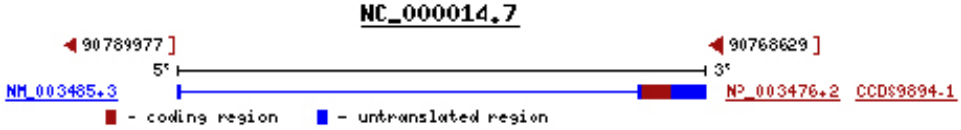
Size: 365 amino acids.

### *Expression*

GPR68 is expressed in blood; bone; brain; connective tissue; embryonic tissue; eye; heart, intestine; lung; pancreas; placenta; peripheral blood leukocyte, prostate; skin; stomach; thymus; uterus; chondrosarcoma; leukemia; normal; pancreatic cancer; small intestine, soft tissue/muscle tissue tumor; spleen, stomach tumor; testis, uterine tumor; embryo; fetus; adult.




Picture from Entrez Gene.




Picture from Entrez Gene.

### Localisation

Cell membrane.

### Function

Osteoclastogenesis.

### Homology

OGR1, GPR4, G2A, and TDAG8 share 40% to 50% homology with each other and seem to form a family of GPCRs. GPCRs form homo- and hetero-dimers or -oligomers. Although GPR4 and OGR1 share more than 50% homology, GPR4 forms strong homo- and hetero-dimers with LPA and S1P receptors, but OGR1 forms very weak homo-dimer and relatively weak hetero-dimers with other receptors.

## Implicated in

### Prostate cancer

**Note**

Down regulated in metastatic prostate cancer.

**Oncogenesis**

OGR1 is down regulated in metastatic prostate cancer tissues and over-expression OGR1 in prostate cancer cells suppresses tumor metastasis. Thus, OGR1 has been considered as a tumor metastasis suppressor genes for prostate cancer (Singh et al., 2007).

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*This article should be referenced as such:*

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