

Molecular mechanisms for S1P₂ G protein coupled receptor-mediated inhibition of tumor progression

メタデータ	言語: jpn 出版者: 公開日: 2022-05-19 キーワード (Ja): キーワード (En): 作成者: Takuwa, Noriko メールアドレス: 所属:
URL	https://doi.org/10.24517/00056989

This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 International License.



2007 Fiscal Year Final Research Report Summary

Molecular mechanisms for S1P₂ G protein coupled receptor-mediated inhibition of tumor progression

Research Project

Project/Area Number

18590259

Research Category

Grant-in-Aid for Scientific Research (C)

Allocation Type

Single-year Grants

Section

一般

Research Field

General medical chemistry

Research Institution

Kanazawa University

Principal Investigator

TAKUWA Noriko Kanazawa University, Graduate School of Medicine, Research Associate (70150290)

Project Period (FY)

2006 – 2007

Keywords

Cancer / Signal transduction / Lipids / Bioactive molecules / G protein-coupled receptor

Research Abstract

Plasma-derived lipid mediator sphingosine- 1-phosphate (S1P) acts via the G protein-coupled SIP receptor family to regulate a variety of physiological and pathological responses. S1P₁ receptor mediates endothelial cell migration and vascular maturation, promoting vascular integrity. We have previously shown that S1P₂R is distinct from S1P₁R in that it negatively regulates cell migration and endothelial capillary tube formation hi vitro. In the present study we investigated the role of host cell S1P₂R in tumor growth and angiogenesis by comparing S1P₂ knock out (KO) and their wild type (WT) littermate mice. Lewis lung carcinoma cells and B16BL6 melanoma cells were subcutaneously injected to S1P₂KO and WT mice and allowed to grow for 3 weeks. Tumors of either cell type grew substantially more rapidly in S1P₂KO as compared with WT mice. Tumors in S1P₂KO mice displayed significant

increases in the number of blood vessels, blood vessel cross sectional area and association of desmin-positive mural cells around the tumor vessels. Leakage of intravenously injected FITC-dextran per a unit area of tumor was increased in S1P_2KO compared with WT mice, in part because of increased numbers of vessels. Tumors in S1P_2KO mice also showed upregulation of angiogenic factors including VEGF-A, Notch ligand Delta-like ligand 4 and TGFβ1. The results indicate that host cell S1P_2R negatively regulates tumor growth and angiogenesis in vivo, with inhibition of angiogenic gene expression and mural cell recruitment. Selective activation of S1P_2R would be a promising novel anti-tumor therapeutic strategy.

Research Products (56 results)

	All	2008	2007	2006
	All	Journal Article (14 results) (of which Peer Reviewed: 7 results)	Presentation (40 results)	Book (2 results)
[Journal Article] The lysophospholipid mediator sphingosine-1-phosphate promotes angiogenesis in vivo in ischemic hindlimbs of mice.			2008	▼
[Journal Article] A Case report of a renal mixed epithelial and stromal tumor in a heterozygous S1P2 receptor deficient mouse. J.			2008	▼
[Journal Article] Sphingosine-1-phosphatesignaling and biological activities in the cardiovascular system.			2008	▼
[Journal Article] The lysophospholipid mediator sphingosine-1-phosphate promotes angiogenesis in vivo in ischemic hindlimbs of mice			2008	▼
[Journal Article] A Case report of a renal mixed epithelial and stromal tumor in a heterozygous S1P2 receptor deficient mouse			2008	▼
[Journal Article] Sphingosine-1-phosphatesignaling and biological activities in the cardiovascular system			2008	▼
[Journal Article] Ca ²⁺ -independent, inhibitory effects of cyclic AMP on Ca ²⁺ regulation of phosphoinositide 3-kinase C2α, Rho and myosin phosphatase in vascular smooth muscle			2007	▼
[Journal Article] Essential role for class II phosphoinositide 3-kinase alpha-isoform in Ca ²⁺ -induced, Rho-and Rho kinase-dependent regulation of myosin phosphatase and contraction in isolated vascular smooth muscle cells.			2007	▼
[Journal Article] Ca ²⁺ -independent, inhibitory effects of cyclic AMP on Ca ²⁺ regulation of phosphoinositide 3-kinase C2α, Rho and myosin phosphatase in vascular smooth muscle			2007	▼
[Journal Article] Essential role for class II phosphoinositide 3-kinase alpha-isoform in Ca ²⁺ -induced, Rho- and Rho kinase-dependent regulation of myosin phosphatase and contraction in isolated vascular smooth muscle cells			2007	▼
[Journal Article] Negative regulation of endothelial morphogenesis and angiogenesis by S1P2 receptor.			2006	▼
[Journal Article] カルシウムイオンによる血管収縮活性化機構の新展開			2006	▼
[Journal Article] Negative regulation of endothelial morphogenesis and angiogenesis by S1P2 receptor			2006	▼
[Journal Article] A new frontier of investigation on the activation mechanisms for calcium ion-dependent enhancement of vascular smooth muscle contraction			2006	▼
[Presentation] Sphingosine-1-phosphate signaling in tumor biology			2008	▼
[Presentation] Host cell SIP receptor (s1P_2R) negatively regulations tumor growth and angiogenesis in vivo			2008	▼
[Presentation] Sphingosine-1-phosphate receptor 2 (S1P_2R) negatively regulates tumor angiogenesis, vascular maturation and integrity in vivo			2008	▼
[Presentation] Sustained delivery of sphingosine-1-phosphate (S1P) by using PLGA microparticles stimulates post-ischemic angiogenesis			2008	▼
[Presentation] Sphingosine-1-phosphate receptor□2(S1P2R)negatively regulates tumor angiogenesis, vascular maturation and integrity in vivo			2008	▼
[Presentation] Sustained delivery of sphingosine-1-phosphate(S1P)by using PLGA microparticles stimulates post-ischemic angiogenesis			2008	▼

[Presentation] Sphingosine-1-phosphate signaling in tumor biology	2008 ▼
[Presentation] Host cell S1P receptor(s1P_2R)negatively regulations tumor growth and angiogenesis in vivo.	2008 ▼
[Presentation] Mechanisms for inhibition of S1P, receptor-dependent inhibition of the small molecular weight G Protein Rac	2007 ▼
[Presentation] Development of cardiac fibrosis but not spontaneous malignancy in mice transgenic for sphingosine kinase la Symposium : Frontiers of lysophospholipid mediator research	2007 ▼
[Presentation] Investigation on the Rho effector that mediates S1P, receptor-dependent inhibition of cell migration.	2007 ▼
[Presentation] Cyclic AMP prevents class II α -isoform of phosphoinositide 3-kinase (PI3K-C2 α)- and ROCK-dependent inhibition of myosin light chain phosphatase (MLCP) in vascular smooth muscle	2007 ▼
[Presentation] Transgenic overexpression of sphingosine kinase la in mice provokes cardiac fibrosis but not increased spontaneous malignancy	2007 ▼
[Presentation] Topical administration of sphingosine-1-phosphate(S1P)stimulates ischemia-induced angiogenesis in the mouse limb.	2007 ▼
[Presentation] Sphingosine 1-phosphate(S1P)-induced inhibition of cell migration and Rac is independent of S1P-induced stimulation of PTEN.	2007 ▼
[Presentation] Development of decompensated cardiac hypertrophy with fibrosis in transgenic mice that overexpress S1P1 under the control of a smooth muscle actin promoter	2007 ▼
[Presentation] Development of decompensated cardiac hypertrophy with fibrosis in transgenic mice that overexpress SIP_1 receptor under the control of a smooth muscle actin promoter	2007 ▼
[Presentation] Topical administration of sphingosine-1-phosphate (S1P) stimulates ischemia-induced angiogenesis in the mouse limb	2007 ▼
[Presentation] Sphingosine 1-phosphate (S1P)-induced inhibition of cell migration and Rac is independent of S1P-induced stimulation of PTEN	2007 ▼
[Presentation] S1P受容体S1P2による低分子量G 蛋白質Rac 抑制のメカニズム	2007 ▼
[Presentation] スフィンゴシキナーゼ1a トランスジェニックマウスにおける心筋線維化の発症	2007 ▼
[Presentation] S1P_2受容体の細胞遊走抑制作用を仲介するRho エフェクターの検討	2007 ▼
[Presentation] Cyclic AMP prevents class II α -isoform of phosphoinositide 3-kinase(PI3K-C2 α)-and ROCK-dependent inhibition of myosin light chain phosphatase (MLCP) in vascular smooth muscledai	2007 ▼
[Presentation] Transgenic overexpression of sphingosine kinase la in mice provokes cardiac fibrosis but not increased spontaneous malignancy	2007 ▼
[Presentation] Topical administration of Sphingosine-1-phosphate(S1P)stimulates ischemia-induced angiogenesis in the mouse limb	2006 ▼
[Presentation] Development of decompensated cardiac hypertrophy with fibrosis in transgenic mice that overexpress S1P1 under the control of a smooth muscle actin promoter	2006 ▼
[Presentation] Age-dependent progression of cardiac fibrosis but not spontaneous malignancy in sphingosine kinase 1 transgenic mice	2006 ▼
[Presentation] Regulation of Akt activation and cell migration by Lysosphop hatidic acid(LPA)	2006 ▼
[Presentation] Sphingosine-1-phosphate negatively regulates endothelial morp hogensis and angiogenesis via its receptor S1P2	2006 ▼
[Presentation] スフィンゴシン-1-リン酸受容体1(S1P1)トランスジェニックマウスにおける病的肥大心の発症と病態生理	2006 ▼
[Presentation] S1P受容体S1P2による細胞遊走抑制はがん抑制遺伝子産物PTENに依存しない	2006 ▼
[Presentation] PI3キナーゼ・クラスII α はRho活性化を介してカルシウム依存性血管平滑筋収縮を制御する	2006 ▼

- [Presentation] Development of cardiac hypertrophy in mice transgenic for sphingosine-1-phosphate 1 (S1P_1) receptor and its pathophysiology 2006 ▾
- [Presentation] S1P_2 receptor-mediated inhibition of cell migration is independent of the tumor suppressor PTEN 2006 ▾
- [Presentation] PI3-kinase class II alpha regulates calcium ion-dependent enhancement of smooth muscle contraction via Rho activation 2006 ▾
- [Presentation] Topical administration of sphingosine-1-phosphate (S1P) stimulates ischemia-induced angiogenesis in the mouse limb 2006 ▾
- [Presentation] Development of decompensated cardiac hypertrophy with fibrosis in transgenic mice that overexpress S1P_1 receptor under the control of a smooth muscle actin promoter. 2006 ▾
- [Presentation] Age-dependent progression of cardiac fibrosis but not spontaneous malignancy in sphingosine kinase 1 transgenic mice 2006 ▾
- [Presentation] Regulation of Akt activation and cell migration by lysophosphatidic acid (LPA) 2006 ▾
- [Presentation] Sphingosine-1-phosphate negatively regulates endothelial morphogenesis and angiogenesis via its receptor SIP_2 2006 ▾
- [Book] Sphingolipid Biology. 2006 ▾
- [Book] Sphingolipid Biology 2006 ▾

URL: https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-18590259/185902592007kenkyu_seika_hokoku

Published: 2010-02-03