Scopus

Document details

Back to results | 1 of 1

Export Download Print E-mail Save to PDF Add to List More...

Journal of Pure and Applied Microbiology
Volume 8, Issue SPEC. ISS. 1, May 2014, Pages 681-689

Pathway analysis of genes affected in Mcf-7 breast cancer cells treated with recombinant bromelain (Article)

Fouz, N.[a], Amid, A.[b], Hashim, Y.Z.H.-Y.[c]

[a]Department of Biotechnology Engineering, Faculty of Engineering, International Islamic University Malaysia, P.O. Box 10, 50728 Kuala Lumpur, Malaysia
[b]Bioprocess and Molecular Engineering Research Unit, Department of Biotechnology Engineering, International Islamic University Malaysia, P.O. Box 10, 50728 Kuala Lumpur, Malaysia
[c]International Institute for Halal Research and Training, Faculty of Engineering, International Islamic University Malaysia, Block E0, 50728 Kuala Lumpur, Malaysia

Abstract

View references (32)

The contributing molecular pathways underlying the pathogenesis of breast cancer need to be better characterized. The goal of the present study is to understand the probable molecular mechanism and the associated pathway related to recombinant bromelain treatment on MCF-7 breast cancer cells. Within 1102 known genes differentially expressed to a significant degree ($p<0.001$) set, 34 genes were significantly changed between treated cells and the control cells with cutoff fold change more than 2. These genes are LYRM2, TUBB2C, LRRFIP1, HMGN2, HMGN2, GLTSCR2, RN28S1, HIST2H4B, HIST2H4A, PA2G4, ACTB, C1orf152, RPS3A, C12orf51, RAP1B, FLJ16171, CCDC59, MGEA5, KIFAP3, GPBP1, KLHDC2, TBPL1, STK38L, RIOK3, CLK4 SNORD46, C7orf60, BTG1, TMEM59, ARID4A, C6orf62, FRG1, DEFB109P1B and RBMS1. With this exploratory study using Ingenuity Pathway Analysis IPA, we aim to identify the overlapping pathways associated with recombinant bromelain treatment and its anti-cancer mechanisms in MCF-7 breast cancer cells. The pathways identification has been shown to be associated with recombinant bromelain function on cell cycle, cancer, cell death & survival, cellular development, tumor morphology, cellular growth and proliferation. This finding will enhance the power of In-vitro breast cancer study and lead to better understanding on mechanisms of action of recombinant bromelain in fighting cancer.

Author keywords

Bromelain Cancer Cytotoxic Ingenuity Pathway Analysis (IPA) MCF-7 Microarray

ISSN: 09737510
Source Type: Journal
Original language: English
Document Type: Article
Publisher: Journal of Pure and Applied Microbiology

References (32)

View in search results format

All Export Print E-mail Save to PDF Create bibliography

Metrics

0 Citations in Scopus

0 Field-Weighted Citation Impact

PlumX Metrics

Usage, Captures, Mentions, Social Media and Citations beyond Scopus.

Cited by 0 documents

Inform me when this document is cited in Scopus:

Set citation alert Set citation feed

Related documents

Gene expression analysis in MCF-7 breast cancer cells treated with recombinant bromelain
Fouz, N. , Amid, A. , Hashim, Y.Z.H.-Y.
(2014) Applied Biochemistry and Biotechnology

Cytokinetic study of MCF-7 cells treated with commercial and recombinant bromelain
Fouz, N. , Amid, A. , Hashim, Y.Z.H.-Y.
(2013) Asian Pacific Journal of Cancer Prevention

Functional characterization of recombinant bromelain of Ananas comosus expressed in a prokaryotic system
George, S. , Bhasker, S. , Madhav, H.
(2014) Molecular Biotechnology

View all related documents based on references

provided by The International Islamic University Malaysia Repository
View metadata, citation and similar papers at core.ac.uk
brought to you by CORE

1 Chobotova, K., Vernallis, A.B., Majid, F.A.A.
Bromelain's activity and potential as an anti-cancer agent: Current evidence and perspectives
(2010) *Cancer Letters*, 290 (2), pp. 148-156. Cited 70 times.
doi: 10.1016/j.canlet.2009.08.001
View at Publisher

2 Chobotova, K., Vernallis, A.B., Majid, F.A.A.
Bromelain's activity and potential as an anti-cancer agent: Current evidence and perspectives
(2010) *Cancer Letters*, 290 (2), pp. 148-156. Cited 70 times.
doi: 10.1016/j.canlet.2009.08.001
View at Publisher

3 Hale, L.P., Greer, P.K., Trinh, C.T., James, C.L.
Proteinase activity and stability of natural bromelain preparations
(2005) *International Immunopharmacology*, 5 (4), pp. 783-793. Cited 92 times.
doi: 10.1016/j.intimp.2004.12.007
View at Publisher

4 Maurer, H.R.
Bromelain: Biochemistry, pharmacology and medical use
(2001) *Cellular and Molecular Life Sciences*, 58 (9), pp. 1234-1245. Cited 270 times.
View at Publisher

5 Amid, A., Ismail, N.A., Yusof, F., Salleh, H.M.
Expression, purification, and characterization of a recombinant stem bromelain from Ananas comosus
(2011) *Process Biochemistry*, 46 (12), pp. 2232-2239. Cited 27 times.
doi: 10.1016/j.procbio.2011.08.018
View at Publisher

6 Bala, M., Salleh, H.M., Amid, A., Mel, M., Jami, M.S.
Recovery of recombinant bromelain from Escherichia coli BL21-AI
(2011) *African Journal of Biotechnology*, 10 (81), pp. 18829-18832. Cited 9 times.
http://www.academicjournals.org/AJB/PDF/pdf2011/16DecConf/Bala%20et%20al.pdf
doi: 10.5897/AJB11.2761
View at Publisher

7 Thornton, S., Sowders, D., Aronow, B., Witte, D.P., Brunner, H.I., Giannini, E.H., Hirsch, R.
DNA microarray analysis reveals novel gene expression profiles in collagen-induced arthritis
(2002) *Clinical Immunology*, 105 (2), pp. 155-168. Cited 51 times.
doi: 10.1006/clim.2002.5227
View at Publisher

Find more related documents in Scopus based on:
Authors > Keywords >

8 Ghosh, S., Zang, S., Mitra, P.S., Ghimbovschi, S., Hoffman, E.P., Dutta, S.K.

Global gene expression and Ingenuity biological functions analysis on PCBs 153 and 138 induced human PBMC in vitro reveals differential mode(s) of action in developing toxicities

(2011) *Environment International*, 37 (5), pp. 838-857. Cited 19 times.
www.elsevier.com/locate/envint
doi: 10.1016/j.envint.2011.02.010

View at Publisher

9 Miki, Y., Swensen, J., Shattuck-Eidens, D., Futreal, P.A., Harshman, K., Tavtigian, S., Liu, Q., (...), Skolnick, M.H.

A strong candidate for the breast and ovarian cancer susceptibility gene BRCA1

(1994) *Science*, 266 (5182), pp. 66-71. Cited 4368 times.

View at Publisher

10 Yoshida, K., Miki, Y.

Role of BRCA1 and BRCA2 as regulators of DNA repair, transcription, and cell cycle in response to DNA damage

(2004) *Cancer Science*, 95 (11), pp. 866-871. Cited 224 times.
doi: 10.1111/j.1349-7006.2004.tb02195.x

View at Publisher

11 Campisi, J., D'Adda Di Fagagna, F.

Cellular senescence: When bad things happen to good cells

(2007) *Nature Reviews Molecular Cell Biology*, 8 (9), pp. 729-740. Cited 1643 times.
doi: 10.1038/nrm2233

View at Publisher

12 Thakur, R., Mishra, D.
Modulation of cell death pathways in cancer stem cells: Targeting histone demethylases
(2012) *Sci. Research*, 3, pp. 720-730.

13 Dey, B.K., Stalker, L., Schnerch, A., Bhatia, M., Taylor-Papidimitriou, J., Wynder, C.

The histone demethylase KDM5b/JARID1b plays a role in cell fate decisions by blocking terminal differentiation

(2008) *Molecular and Cellular Biology*, 28 (17), pp. 5312-5327. Cited 60 times.
doi: 10.1128/MCB.00128-08

View at Publisher

14 Dean, J.L., Thangavel, C., McClendon, A.K., Reed, C.A., Knudsen, E.S.

Therapeutic CDK4/6 inhibition in breast cancer: Key mechanisms of response and failure

(2010) *Oncogene*, 29 (28), pp. 4018-4032. Cited 111 times.
doi: 10.1038/onc.2010.154

View at Publisher

15 Jurmeister, S., Baumann, M., Balwierz, A., Keklikoglou, I., Ward, A., Uhlmann, S., Zhang, J.D., (...), Sahin, Ö.

MicroRNA-200c represses migration and invasion of breast cancer cells by targeting actin-regulatory proteins FHOD1 and PPM1F

(2012) *Molecular and Cellular Biology*, 32 (3), pp. 633-651. Cited 112 times.
http://mcb.asm.org/content/32/3/633.full.pdf
doi: 10.1128/MCB.06212-11

View at Publisher

16 Chen, Y., Shi, L., Zhang, L., Li, R., Liang, J., Yu, W., Sun, L., (...), Shang, Y.

The molecular mechanism governing the oncogenic potential of SOX2 in breast cancer

(2008) *Journal of Biological Chemistry*, 283 (26), pp. 17969-17978. Cited 221 times.
http://www.jbc.org/cgi/reprint/283/26/17969
doi: 10.1074/jbc.M802917200

View at Publisher

17 Otsubo, T., Akiyama, Y., Yanagihara, K., Yuasa, Y.

SOX2 is frequently downregulated in gastric cancers and inhibits cell growth through cell-cycle arrest and apoptosis

(2008) *British Journal of Cancer*, 98 (4), pp. 824-831. Cited 125 times.
doi: 10.1038/sj.bjc.6604193

View at Publisher

18 Rouault, J.-P., Falette, N., Guehenneux, F., Guillot, C., Rimokh, R., Wang, Q., Berthet, C., (...), Puisieux, A.

Identification of BTG2, an antiproliferative p53-dependent component of the DNA damage cellular response pathway

(1996) *Nature Genetics*, 14 (4), pp. 482-486. Cited 297 times.
doi: 10.1038/ng1296-482

View at Publisher

19 Il, J.C., Ae, K.L., Song, J.L., Myung, G.L., Kim, S.G.

Repression by oxidative stress of iNOS and cytokine gene induction in macrophages results from AP-1 and NF-κB inhibition mediated by B cell translocation gene-1 activation

(2005) *Free Radical Biology and Medicine*, 39 (11), pp. 1523-1536. Cited 24 times.
doi: 10.1016/j.freeradbiomed.2005.07.017

View at Publisher

20 Hamatani, T., Daikoku, T., Wang, H., Matsumoto, H., Carter, M.G., Ko, M.S.H., Dey, S.K.

Global gene expression analysis identifies molecular pathways distinguishing blastocyst dormancy and activation

(2004) *Proceedings of the National Academy of Sciences of the United States of America*, 101 (28), pp. 10326-10331. Cited 158 times.
doi: 10.1073/pnas.0402597101

View at Publisher

21 Blomme, E.A.G., Yang, Y., Waring, J.F.

Use of toxicogenomics to understand mechanisms of drug-induced hepatotoxicity during drug discovery and development

(2009) *Toxicology Letters*, 186 (1), pp. 22-31. Cited 90 times.
doi: 10.1016/j.toxlet.2008.09.017

View at Publisher

22 Saverio, B., Pierpaola, D., Serenella, A., Cesare, C., Bruno, M., Auro, T., Arnaldo, C.

Tumor progression is accompanied by significant changes in the levels of expression of polyamine metabolism regulatory genes and clusterin (sulfated glycoprotein 2) in human prostate cancer specimens

(2000) *Cancer Research*, 60 (1), pp. 28-34. Cited 99 times.

View at Publisher

23 Li, H., Lee, T.-H., Avraham, H.

A novel tricomplex of BRCA1, Nmi, and c-Myc inhibits c-Myc-induced human telomerase reverse transcriptase gene (hTERT) promoter activity in breast cancer

(2002) *Journal of Biological Chemistry*, 277 (23), pp. 20965-20973. Cited 92 times.
doi: 10.1074/jbc.M112231200

View at Publisher

24 Cox, D.G., Penney, K., Guo, Q., Hankinson, S.E., Hunter, D.J.

TGFB1 and TGFBR1 polymorphisms and breast cancer risk in the Nurses' Health Study

(2007) *BMC Cancer*, 7, art. no. 175. Cited 42 times.
doi: 10.1186/1471-2407-7-175

View at Publisher

25 Henderson, B.E., Feigelson, H.S.

Hormonal carcinogenesis

(2000) *Carcinogenesis*, 21 (3), pp. 427-433. Cited 614 times.

View at Publisher

26 Karadedou, C.T.

Regulation of the FOXM1 transcription factor by the estrogen receptor a at the protein level, in breast cancer

(2006) *Hippokratia*, 10 (3), pp. 128-132. Cited 13 times.
http://www.hippokratia.gr//index.php/hippo/article/view/497/202

27 Lin, Y., Huang, R., Chen, L., Li, S., Shi, Q., Jordan, C., Huang, R.-P.

Identification of interleukin-8 as estrogen receptor-regulated factor involved in breast cancer invasion and angiogenesis by protein arrays

(2004) *International Journal of Cancer*, 109 (4), pp. 507-515. Cited 137 times.
doi: 10.1002/ijc.11724

View at Publisher

28 Kim, Y.-J., Cho, Y.-E., Kim, Y.-W., Kim, J.-Y., Lee, S., Park, J.-H.

Suppression of putative tumour suppressor gene GLTSCR2 expression in human glioblastomas

(2008) *Journal of Pathology*, 216 (2), pp. 218-224. Cited 38 times.
doi: 10.1002/path.2401

View at Publisher

29 Kalt, I., Borodianskiy-Shteinberg, T., Schachor, A., Sarid, R.

GLTSCR2/PICT-1, a putative tumor suppressor gene product, induces the nucleolar targeting of the Kaposi's sarcoma-associated herpesvirus KS-Bcl-2 protein

(2010) *Journal of Virology*, 84 (6), pp. 2935-2945. Cited 14 times.
http://jvi.asm.org/cgi/reprint/84/6/2935
doi: 10.1128/JVI.00757-09

View at Publisher

30 Yu, F., Li, J., Chen, H., Fu, J., Ray, S., Huang, S., Zheng, H., (...), Ai, W.

Kruppel-like factor 4 (KLF4) is required for maintenance of breast cancer stem cells and for cell migration and invasion

(2011) *Oncogene*, 30 (18), pp. 2161-2172. Cited 165 times.
doi: 10.1038/onc.2010.591

View at Publisher

31 Yori, J.L., Johnson, E., Zhou, G., Jain, M.K., Keri, R.A.

Krüppel-like factor 4 inhibits epithelial-to-mesenchymal transition through regulation of E-cadherin gene expression

(2010) *Journal of Biological Chemistry*, 285 (22), pp. 16854-16863. Cited 91 times.
http://www.jbc.org/content/285/22/16854.full.pdf+html
doi: 10.1074/jbc.M110.114546

View at Publisher

32 Davis-Dusenbery, B.N., Chan, M.C., Reno, K.E., Weisman, A.S., Layne, M.D., Lagna, G., Hata, A.

Down-regulation of Krüppel-like Factor-4 (KLF4) by microRNA-143/145 is critical for modulation of vascular smooth muscle cell phenotype by transforming growth factor-β and bone morphogenetic protein 4

(2011) *Journal of Biological Chemistry*, 286 (32), pp. 28097-28110. Cited 136 times.
http://www.jbc.org/content/286/32/28097.full.pdf+html
doi: 10.1074/jbc.M111.236950

View at Publisher

Amid, A.; Bioprocess and Molecular Engineering Research Unit, Department of Biotechnology Engineering, International Islamic University Malaysia, P.O. Box 10, Malaysia; email:azuraamid@iium.edu.my
© Copyright 2014 Elsevier B.V., All rights reserved.

Back to results | 1 of 1 Top of page

About Scopus
What is Scopus
Content coverage
Scopus blog
Scopus API
Privacy matters

Language
日本語に切り替える
切换到简体中文
切換到繁體中文
Русский язык

Customer Service
Help
Contact us

ELSEVIER
Terms and conditions Privacy policy
Copyright © 2017 Elsevier B.V. All rights reserved. Scopus® is a registered trademark of Elsevier B.V.
Cookies are set by this site. To decline them or learn more, visit our Cookies page.
RELX Gr