

REFERENCES

1. Gupta GP, Massague J. Cancer metastasis: building a framework. *Cell*. 2006;127(4):679-95.
2. Mehlen P, Puisieux A. Metastasis: a question of life or death. *Nat Rev Cancer*. 2006;6(6):449-58.
3. Brooks SA, Lomax-Browne HJ, Carter TM, Kinch CE, Hall DM. Molecular interactions in cancer cell metastasis. *Acta Histochem*. 2010;112(1):3-25.
4. Cavallaro U, Christofori G. Cell adhesion in tumor invasion and metastasis: loss of the glue is not enough. *Biochim Biophys Acta*. 2001;1552(1):39-45.
5. Woodward JK, Holen I, Coleman RE, Buttle DJ. The roles of proteolytic enzymes in the development of tumour-induced bone disease in breast and prostate cancer. *Bone*. 2007;41(6):912-27.
6. Dass K, Ahmad A, Azmi AS, Sarkar SH, Sarkar FH. Evolving role of uPA/uPAR system in human cancers. *Cancer Treat Rev*. 2008;34(2):122-36.
7. Ulisse S, Baldini E, Sorrenti S, D'Armiento M. The urokinase plasminogen activator system: a target for anti-cancer therapy. *Curr Cancer Drug Targets*. 2009;9(1):32-71.
8. Tang L, Han X. The urokinase plasminogen activator system in breast cancer invasion and metastasis. *Biomed Pharmacother*. 2013;67(2):179-82.
9. Li Y, Cozzi PJ. Targeting uPA/uPAR in prostate cancer. *Cancer Treat Rev*. 2007;33(6):521-7.
10. Sbardella D, Fasciglione GF, Gioia M, Ciaccio C, Tundo GR, Marini S, et al. Human matrix metalloproteinases: an ubiquitous class of enzymes involved in several pathological processes. *Mol Aspects Med*. 2012;33(2):119-208.
11. Vu TH, Werb Z. Matrix metalloproteinases: effectors of development and normal physiology. *Genes Dev*. 2000;14(17):2123-33.
12. Malemud CJ. Matrix metalloproteinases (MMPs) in health and disease: an overview. *Front Biosci*. 2006;11:1696-701.

13. Foda HD, Zucker S. Matrix metalloproteinases in cancer invasion, metastasis and angiogenesis. *Drug Discov Today*. 2001;6(9):478-82.
14. Schveigert D, Cicenias S, Bruzas S, Samalavicius NE, Gudleviciene Z, Didziapetriene J. The value of MMP-9 for breast and non-small cell lung cancer patients' survival. *Adv Med Sci*. 2013;58(1):73-82.
15. Santos A, Lopes C, Frias C, Amorim I, Vicente C, Gartner F, et al. Immunohistochemical evaluation of MMP-2 and TIMP-2 in canine mammary tumours: a survival study. *Vet J*. 2011;190(3):396-402.
16. Sullu Y, Demirag GG, Yildirim A, Karagoz F, Kandemir B. Matrix metalloproteinase-2 (MMP-2) and MMP-9 expression in invasive ductal carcinoma of the breast. *Pathol Res Pract*. 2011;207(12):747-53.
17. Kothari P, Pestana R, Mesraoua R, Elchaki R, Khan KM, Dannenberg AJ, et al. IL-6-mediated induction of matrix metalloproteinase-9 is modulated by JAK-dependent IL-10 expression in macrophages. *J Immunol*. 2014;192(1):349-57.
18. Folgueras AR, Pendas AM, Sanchez LM, Lopez-Otin C. Matrix metalloproteinases in cancer: from new functions to improved inhibition strategies. *Int J Dev Biol*. 2004;48(5-6):411-24.
19. Yu Q, Stamenkovic I. Cell surface-localized matrix metalloproteinase-9 proteolytically activates TGF-beta and promotes tumor invasion and angiogenesis. *Genes Dev*. 2000;14(2):163-76.
20. Olson MW, Gervasi DC, Mobashery S, Fridman R. Kinetic analysis of the binding of human matrix metalloproteinase-2 and -9 to tissue inhibitor of metalloproteinase (TIMP)-1 and TIMP-2. *J Biol Chem*. 1997;272(47):29975-83.
21. Baum O, Ganster M, Baumgartner I, Nieselt K, Djonov V. Basement membrane remodeling in skeletal muscles of patients with limb ischemia involves regulation of matrix metalloproteinases and tissue inhibitor of matrix metalloproteinases. *J Vasc Res*. 2007;44(3):202-13.
22. Nissinen L, Kahari VM. Matrix metalloproteinases in inflammation. *Biochim Biophys Acta*. 2014;1840(8):2571-80.

23. Bauvois B. New facets of matrix metalloproteinases MMP-2 and MMP-9 as cell surface transducers: outside-in signaling and relationship to tumor progression. *Biochim Biophys Acta*. 2012;1825(1):29-36.
24. Hussain SP, Trivers GE, Hofseth LJ, He P, Shaikh I, Mechanic LE, et al. Nitric oxide, a mediator of inflammation, suppresses tumorigenesis. *Cancer Res*. 2004;64(19):6849-53.
25. Vendramini-Costa DB, Carvalho JE. Molecular link mechanisms between inflammation and cancer. *Curr Pharm Des*. 2012;18(26):3831-52.
26. Aggarwal BB, Shishodia S, Sandur SK, Pandey MK, Sethi G. Inflammation and cancer: how hot is the link? *Biochem Pharmacol*. 2006;72(11):1605-21.
27. Sleeman J, Steeg PS. Cancer metastasis as a therapeutic target. *Eur J Cancer*. 2010;46(7):1177-80.
28. Shanmugam MK, Nguyen AH, Kumar AP, Tan BK, Sethi G. Targeted inhibition of tumor proliferation, survival, and metastasis by pentacyclic triterpenoids: potential role in prevention and therapy of cancer. *Cancer Lett*. 2012;320(2):158-70.
29. Weng CJ, Yen GC. Chemopreventive effects of dietary phytochemicals against cancer invasion and metastasis: phenolic acids, monophenol, polyphenol, and their derivatives. *Cancer Treat Rev*. 2012;38(1):76-87.
30. Sartor L, Pezzato E, Dell'Aica I, Caniato R, Biggin S, Garbisa S. Inhibition of matrix-proteases by polyphenols: chemical insights for anti-inflammatory and anti-invasion drug design. *Biochem Pharmacol*. 2002;64(2):229-37.
31. Shao Y, Bao J. Polyphenols in whole rice grain: Genetic diversity and health benefits. *Food Chem*. 2015;180:86-97.
32. Min B, Gub L, McClung AM, Bergman CJ, Chen MH. Free and bound total phenolic concentrations, antioxidant capacities, and profiles of proanthocyanidins and anthocyanins in whole grain rice (*Oryza sativa* L.) of different bran colours (*Oryza sativa* L.) of different bran colours. *Food Chem*. 2012;133:715-22.

33. Gunaratne A, Wu K, Li D, Bentota A, Corke H, Cai YZ. Antioxidant activity and nutritional quality of traditional red-grained rice varieties containing proanthocyanidins. *Food Chem.* 2013;138(2-3):1153-61.
34. Lv H, Zhang X, Chen X, Xie Z, Hu C, Wen C, et al. Phytochemical Compositions and Antioxidant and Anti-Inflammatory Activities of Crude Extracts from *Ficus pandurata* H. (Moraceae). *Evid Based Complement Alternat Med.* 2013;2013:215036.
35. Colotta F, Allavena P, Sica A, Garlanda C, Mantovani A. Cancer-related inflammation, the seventh hallmark of cancer: links to genetic instability. *Carcinogenesis.* 2009;30(7):1073-81.
36. Mantovani A. Cancer: Inflaming metastasis. *Nature.* 2009;457(7225):36-7.
37. Lu H, Ouyang W, Huang C. Inflammation, a key event in cancer development. *Mol Cancer Res.* 2006;4(4):221-33.
38. Reuter S, Gupta SC, Chaturvedi MM, Aggarwal BB. Oxidative stress, inflammation, and cancer: how are they linked? *Free Radic Biol Med.* 2010;49(11):1603-16.
39. Marusawa H, Jenkins BJ. Inflammation and gastrointestinal cancer: an overview. *Cancer Lett.* 2014;345(2):153-6.
40. Kundu JK, Surh YJ. Emerging avenues linking inflammation and cancer. *Free Radic Biol Med.* 2012;52(9):2013-37.
41. Lin WW, Karin M. A cytokine-mediated link between innate immunity, inflammation, and cancer. *J Clin Invest.* 2007;117(5):1175-83.
42. Miyake K, Kaisho T. Homeostatic inflammation in innate immunity. *Curr Opin Immunol.* 2014;30:85-90.
43. Guven Maivorov E, Keskin O, Gursoy A, Nussinov R. The structural network of inflammation and cancer: merits and challenges. *Semin Cancer Biol.* 2013;23(4):243-51.
44. Del Prete A, Allavena P, Santoro G, Fumarulo R, Corsi MM, Mantovani A. Molecular pathways in cancer-related inflammation. *Biochem Med (Zagreb).* 2011;21(3):264-75.

45. Mohamed MM, Al-Raawi D, Sabet SF, El-Shinawi M. Inflammatory breast cancer: New factors contribute to disease etiology: A review. *J Adv Res.* 2014;5(5):525-36.
46. Balkwill FR, Mantovani A. Cancer-related inflammation: common themes and therapeutic opportunities. *Semin Cancer Biol.* 2012;22(1):33-40.
47. Kundu JK, Surh YJ. Inflammation: gearing the journey to cancer. *Mutat Res.* 2008;659(1-2):15-30.
48. Hofseth LJ, Ying L. Identifying and defusing weapons of mass inflammation in carcinogenesis. *Biochim Biophys Acta.* 2006;1765(1):74-84.
49. Ferguson LR. Chronic inflammation and mutagenesis. *Mutat Res.* 2010;690(1-2):3-11.
50. Grivennikov SI, Greten FR, Karin M. Immunity, inflammation, and cancer. *Cell.* 2010;140(6):883-99.
51. Schuijs MJ, Willart MA, Hammad H, Lambrecht BN. Cytokine targets in airway inflammation. *Curr Opin Pharmacol.* 2013;13(3):351-61.
52. Rodriguez-Vita J, Lawrence T. The resolution of inflammation and cancer. *Cytokine Growth Factor Rev.* 2010;21(1):61-5.
53. Nguyen DP, Li J, Yadav SS, Tewari AK. Recent insights into NF-kappaB signalling pathways and the link between inflammation and prostate cancer. *BJU Int.* 2014;114(2):168-76.
54. Wu Y, Antony S, Meitzler JL, Doroshow JH. Molecular mechanisms underlying chronic inflammation-associated cancers. *Cancer Lett.* 2014;345(2):164-73.
55. Viennois E, Chen F, Merlin D. NF-kappaB pathway in colitis-associated cancers. *Transl Gastrointest Cancer.* 2013;2(1):21-9.
56. Naugler WE, Karin M. NF-kappaB and cancer-identifying targets and mechanisms. *Curr Opin Genet Dev.* 2008;18(1):19-26.
57. Arsur M, Cavin LG. Nuclear factor-kappaB and liver carcinogenesis. *Cancer Lett.* 2005;229(2):157-69.

58. Aktan F. iNOS-mediated nitric oxide production and its regulation. *Life Sci.* 2004;75(6):639-53.
59. Kanwar JR, Kanwar RK, Burrow H, Baratchi S. Recent advances on the roles of NO in cancer and chronic inflammatory disorders. *Curr Med Chem.* 2009;16(19):2373-94.
60. O'Sullivan S, Medina C, Ledwidge M, Radomski MW, Gilmer JF. Nitric oxide-matrix metalloproteinase-9 interactions: biological and pharmacological significance--NO and MMP-9 interactions. *Biochim Biophys Acta.* 2014;1843(3):603-17.
61. Cheng H, Wang L, Mollica M, Re AT, Wu S, Zuo L. Nitric oxide in cancer metastasis. *Cancer Lett.* 2014;353(1):1-7.
62. Evans LC, Liu H, Pinkas GA, Thompson LP. Chronic hypoxia increases peroxynitrite, MMP9 expression, and collagen accumulation in fetal guinea pig hearts. *Pediatr Res.* 2012;71(1):25-31.
63. Wu Y, Zhou BP. Inflammation: a driving force speeds cancer metastasis. *Cell Cycle.* 2009;8(20):3267-73.
64. Chang Q, Daly L, Bromberg J. The IL-6 feed-forward loop: a driver of tumorigenesis. *Semin Immunol.* 2014;26(1):48-53.
65. Kesanakurti D, Chetty C, Dinh DH, Gujrati M, Rao JS. Role of MMP-2 in the regulation of IL-6/Stat3 survival signaling via interaction with alpha5beta1 integrin in glioma. *Oncogene.* 2013;32(3):327-40.
66. Huang S. Regulation of metastases by signal transducer and activator of transcription 3 signaling pathway: clinical implications. *Clin Cancer Res.* 2007;13(5):1362-6.
67. Li Y, Samuvel DJ, Sundararaj KP, Lopes-Virella MF, Huang Y. IL-6 and high glucose synergistically upregulate MMP-1 expression by U937 mononuclear phagocytes via ERK1/2 and JNK pathways and c-Jun. *J Cell Biochem.* 2010;110(1):248-59.
68. Jin J, Sundararaj KP, Samuvel DJ, Zhang X, Li Y, Lu Z, et al. Different signaling mechanisms regulating IL-6 expression by LPS between gingival

fibroblasts and mononuclear cells: seeking the common target. *Clin Immunol.* 2012;143(2):188-99.

69. Yoo HG, Shin BA, Park JS, Lee KH, Chay KO, Yang SY, et al. IL-1beta induces MMP-9 via reactive oxygen species and NF-kappaB in murine macrophage RAW 264.7 cells. *Biochem Biophys Res Commun.* 2002;298(2):251-6.
70. Nee LE, McMorrow T, Campbell E, Slattery C, Ryan MP. TNF-alpha and IL-1beta-mediated regulation of MMP-9 and TIMP-1 in renal proximal tubular cells. *Kidney Int.* 2004;66(4):1376-86.
71. Lindstrom TM, Bennett PR. The role of nuclear factor kappa B in human labour. *Reproduction.* 2005;130(5):569-81.
72. Mantovani A, Allavena P, Sica A, Balkwill F. Cancer-related inflammation. *Nature.* 2008;454(7203):436-44.
73. DeNardo DG, Johansson M, Coussens LM. Immune cells as mediators of solid tumor metastasis. *Cancer Metastasis Rev.* 2008;27(1):11-8.
74. Hoesel B, Schmid JA. The complexity of NF-kappaB signaling in inflammation and cancer. *Mol Cancer.* 2013;12:86.
75. Wang Y, Shen Y, Li K, Zhang P, Wang G, Gao L, et al. Role of matrix metalloproteinase-9 in lipopolysaccharide-induced mucin production in human airway epithelial cells. *Arch Biochem Biophys.* 2009;486(2):111-8.
76. Yadav VR, Prasad S, Sung B, Kannappan R, Aggarwal BB. Targeting inflammatory pathways by triterpenoids for prevention and treatment of cancer. *Toxins (Basel).* 2010;2(10):2428-66.
77. Aggarwal BB, Gehlot P. Inflammation and cancer: how friendly is the relationship for cancer patients? *Curr Opin Pharmacol.* 2009;9(4):351-69.
78. Halade GV, Jin YF, Lindsey ML. Matrix metalloproteinase (MMP)-9: a proximal biomarker for cardiac remodeling and a distal biomarker for inflammation. *Pharmacol Ther.* 2013;139(1):32-40.
79. Kurzepa J, Madro A, Czechowska G, Kurzepa J, Celinski K, Kazmierak W, et al. Role of MMP-2 and MMP-9 and their natural inhibitors in liver

fibrosis, chronic pancreatitis and non-specific inflammatory bowel diseases. *Hepatobiliary Pancreat Dis Int.* 2014;13(6):570-9.

80. Tanaka T, Shimizu M, Kochi T, Moriwaki H. Chemical-induced Carcinogenesis. *Journal of Experimental & Clinical Medicine.* 2013;5: 203–9.
81. Geiger TR, Peeper DS. Metastasis mechanisms. *Biochim Biophys Acta.* 2009;1796(2):293-308.
82. Iizumi M, Liu W, Pai SK, Furuta E, Watabe K. Drug development against metastasis-related genes and their pathways: a rationale for cancer therapy. *Biochim Biophys Acta.* 2008;1786(2):87-104.
83. Yokota J. Tumor progression and metastasis. *Carcinogenesis.* 2000;21(3):497-503.
84. Nishikawa M. Reactive oxygen species in tumor metastasis. *Cancer Lett.* 2008;266(1):53-9.
85. Fidler IJ. The pathogenesis of cancer metastasis: the 'seed and soil' hypothesis revisited. *Nat Rev Cancer.* 2003;3(6):453-8.
86. Veisheh O, Kievit FM, Ellenbogen RG, Zhang M. Cancer cell invasion: treatment and monitoring opportunities in nanomedicine. *Adv Drug Deliv Rev.* 2011;63(8):582-96.
87. Polette M, Nawrocki-Raby B, Gilles C, Clavel C, Birembaut P. Tumour invasion and matrix metalloproteinases. *Crit Rev Oncol Hematol.* 2004;49(3):179-86.
88. Zitka O, Kukacka J, Krizkova S, Huska D, Adam V, Masarik M, et al. Matrix metalloproteinases. *Curr Med Chem.* 2010;17(31):3751-68.
89. Stetler-Stevenson WG. The role of matrix metalloproteinases in tumor invasion, metastasis, and angiogenesis. *Surg Oncol Clin N Am.* 2001;10(2):383-92, x.
90. Klein G, Vellenga E, Fraaije MW, Kamps WA, de Bont ES. The possible role of matrix metalloproteinase (MMP)-2 and MMP-9 in cancer, e.g. acute leukemia. *Crit Rev Oncol Hematol.* 2004;50(2):87-100.

91. Visse R, Nagase H. Matrix metalloproteinases and tissue inhibitors of metalloproteinases: structure, function, and biochemistry. *Circ Res.* 2003;92(8):827-39.
92. Curran S, Murray GI. Matrix metalloproteinases: molecular aspects of their roles in tumour invasion and metastasis. *Eur J Cancer.* 2000;36(13 Spec No):1621-30.
93. Nagase H, Visse R, Murphy G. Structure and function of matrix metalloproteinases and TIMPs. *Cardiovasc Res.* 2006;69(3):562-73.
94. Corry DB, Kiss A, Song LZ, Song L, Xu J, Lee SH, et al. Overlapping and independent contributions of MMP2 and MMP9 to lung allergic inflammatory cell egression through decreased CC chemokines. *FASEB J.* 2004;18(9):995-7.
95. Sanceau J, Truchet S, Bauvois B. Matrix metalloproteinase-9 silencing by RNA interference triggers the migratory-adhesive switch in Ewing's sarcoma cells. *J Biol Chem.* 2003;278(38):36537-46.
96. Mattu TS, Royle L, Langridge J, Wormald MR, Van den Steen PE, Van Damme J, et al. O-glycan analysis of natural human neutrophil gelatinase B using a combination of normal phase-HPLC and online tandem mass spectrometry: implications for the domain organization of the enzyme. *Biochemistry.* 2000;39(51):15695-704.
97. Dufour A, Zucker S, Sampson NS, Kuscu C, Cao J. Role of matrix metalloproteinase-9 dimers in cell migration: design of inhibitory peptides. *J Biol Chem.* 2010;285(46):35944-56.
98. Seiki M. The cell surface: the stage for matrix metalloproteinase regulation of migration. *Curr Opin Cell Biol.* 2002;14(5):624-32.
99. Westermarck J, Kahari VM. Regulation of matrix metalloproteinase expression in tumor invasion. *FASEB J.* 1999;13(8):781-92.
100. Farina AR, Mackay AR. Gelatinase B/MMP-9 in Tumour Pathogenesis and Progression. *Cancers (Basel).* 2014;6(1):240-96.
101. Chakrabarti S, Patel KD. Matrix metalloproteinase-2 (MMP-2) and MMP-9 in pulmonary pathology. *Exp Lung Res.* 2005;31(6):599-621.

102. Zucker S, Hymowitz M, Conner C, DeClerck Y, Cao J. TIMP-2 is released as an intact molecule following binding to MT1-MMP on the cell surface. *Exp Cell Res.* 2004;293(1):164-74.
103. Alberts B, Johnson A, Lewis J, Walter P, Raff M, Roberts K. *Molecular Biology of the Cell.* 4th ed. New York 2002.
104. Mruk DD, Xiao X, Lydka M, Li MW, Bilinska B, Cheng CY. Intercellular adhesion molecule 1: recent findings and new concepts involved in mammalian spermatogenesis. *Semin Cell Dev Biol.* 2014;29:43-54.
105. Zhu XW, Gong JP. Expression and role of icam-1 in the occurrence and development of hepatocellular carcinoma. *Asian Pac J Cancer Prev.* 2013;14(3):1579-83.
106. Lin YM, Chang ZL, Liao YY, Chou MC, Tang CH. IL-6 promotes ICAM-1 expression and cell motility in human osteosarcoma. *Cancer Lett.* 2013;328(1):135-43.
107. Braeuer RR, Zigler M, Villares GJ, Dobroff AS, Bar-Eli M. Transcriptional control of melanoma metastasis: the importance of the tumor microenvironment. *Semin Cancer Biol.* 2011;21(2):83-8.
108. Lawson C, Wolf S. ICAM-1 signaling in endothelial cells. *Pharmacol Rep.* 2009;61(1):22-32.
109. Rosette C, Roth RB, Oeth P, Braun A, Kammerer S, Ekblom J, et al. Role of ICAM1 in invasion of human breast cancer cells. *Carcinogenesis.* 2005;26(5):943-50.
110. Huang WC, Chan ST, Yang TL, Tzeng CC, Chen CC. Inhibition of ICAM-1 gene expression, monocyte adhesion and cancer cell invasion by targeting IKK complex: molecular and functional study of novel alpha-methylene-gamma-butyrolactone derivatives. *Carcinogenesis.* 2004;25(10):1925-34.
111. Lund IK, Nielsen BS, Almholt K, Rono B, Hald A, Illemann M, et al. Concomitant lack of MMP9 and uPA disturbs physiological tissue remodeling. *Dev Biol.* 2011;358(1):56-67.

112. Andreasen PA, Egelund R, Petersen HH. The plasminogen activation system in tumor growth, invasion, and metastasis. *Cell Mol Life Sci.* 2000;57(1):25-40.
113. Duffy MJ. The urokinase plasminogen activator system: role in malignancy. *Curr Pharm Des.* 2004;10(1):39-49.
114. Deryugina EI, Quigley JP. Cell surface remodeling by plasmin: a new function for an old enzyme. *J Biomed Biotechnol.* 2012;2012:564259.
115. Sidenius N, Andolfo A, Fesce R, Blasi F. Urokinase regulates vitronectin binding by controlling urokinase receptor oligomerization. *J Biol Chem.* 2002;277(31):27982-90.
116. Rakic JM, Maillard C, Jost M, Bajou K, Masson V, Devy L, et al. Role of plasminogen activator-plasmin system in tumor angiogenesis. *Cell Mol Life Sci.* 2003;60(3):463-73.
117. Yasar Yildiz S, Kuru P, Toksoy Oner E, Agirbasli M. Functional stability of plasminogen activator inhibitor-1. *ScientificWorldJournal.* 2014;2014:858293.
118. Hildenbrand R, Schaaf A, Dorn-Beineke A, Allgayer H, Sutterlin M, Marx A, et al. Tumor stroma is the predominant uPA-, uPAR-, PAI-1-expressing tissue in human breast cancer: prognostic impact. *Histol Histopathol.* 2009;24(7):869-77.
119. Croucher DR, Saunders DN, Lobov S, Ranson M. Revisiting the biological roles of PAI2 (SERPINB2) in cancer. *Nat Rev Cancer.* 2008;8(7):535-45.
120. Zhou HM, Bolon I, Nichols A, Wohlwend A, Vassalli JD. Overexpression of plasminogen activator inhibitor type 2 in basal keratinocytes enhances papilloma formation in transgenic mice. *Cancer Res.* 2001;61(3):970-6.
121. Fuhrman B. The urokinase system in the pathogenesis of atherosclerosis. *Atherosclerosis.* 2012;222(1):8-14.
122. Binder BR, Mihaly J. The plasminogen activator inhibitor "paradox" in cancer. *Immunol Lett.* 2008;118(2):116-24.

123. Duffy MJ. Urokinase plasminogen activator and its inhibitor, PAI-1, as prognostic markers in breast cancer: from pilot to level 1 evidence studies. *Clin Chem*. 2002;48(8):1194-7.
124. Acharya MR, Venitz J, Figg WD, Sparreboom A. Chemically modified tetracyclines as inhibitors of matrix metalloproteinases. *Drug Resist Updat*. 2004;7(3):195-208.
125. Durrant JD, de Oliveira CA, McCammon JA. Pyrone-based inhibitors of metalloproteinase types 2 and 3 may work as conformation-selective inhibitors. *Chem Biol Drug Des*. 2011;78(2):191-8.
126. Baker AH, Edwards DR, Murphy G. Metalloproteinase inhibitors: biological actions and therapeutic opportunities. *J Cell Sci*. 2002;115(Pt 19):3719-27.
127. Bourboulia D, Stetler-Stevenson WG. Matrix metalloproteinases (MMPs) and tissue inhibitors of metalloproteinases (TIMPs): Positive and negative regulators in tumor cell adhesion. *Semin Cancer Biol*. 2010;20(3):161-8.
128. Sun J. Matrix metalloproteinases and tissue inhibitor of metalloproteinases are essential for the inflammatory response in cancer cells. *J Signal Transduct*. 2010;2010:985132.
129. Brew K, Dinakarandian D, Nagase H. Tissue inhibitors of metalloproteinases: evolution, structure and function. *Biochim Biophys Acta*. 2000;1477(1-2):267-83.
130. Clark IM, Swingler TE, Sampieri CL, Edwards DR. The regulation of matrix metalloproteinases and their inhibitors. *Int J Biochem Cell Biol*. 2008;40(6-7):1362-78.
131. Chau I, Rigg A, Cunningham D. Matrix metalloproteinase inhibitors--an emphasis on gastrointestinal malignancies. *Crit Rev Oncol Hematol*. 2003;45(2):151-76.
132. Yadav L, Puri N, Rastogi V, Satpute P, Ahmad R, Kaur G. Matrix metalloproteinases and cancer - roles in threat and therapy. *Asian Pac J Cancer Prev*. 2014;15(3):1085-91.

133. Giavazzi R, Taraboletti G. Preclinical development of metalloprotease inhibitors in cancer therapy. *Crit Rev Oncol Hematol*. 2001;37(1):53-60.
134. Deplanque G, Harris AL. Anti-angiogenic agents: clinical trial design and therapies in development. *Eur J Cancer*. 2000;36(13 Spec No):1713-24.
135. Overall CM, Lopez-Otin C. Strategies for MMP inhibition in cancer: innovations for the post-trial era. *Nat Rev Cancer*. 2002;2(9):657-72.
136. Nielsen BS, Rank F, Illemann M, Lund LR, Dano K. Stromal cells associated with early invasive foci in human mammary ductal carcinoma in situ coexpress urokinase and urokinase receptor. *Int J Cancer*. 2007;120(10):2086-95.
137. Lee CC, Huang TS. Plasminogen Activator Inhibitor-1: The Expression, Biological Functions, and Effects on Tumorigenesis and Tumor Cell Adhesion and Migration. *Journal of Cancer Molecules*. 2005;1(1):25-36.
138. Magdolen U, Krol J, Sato S, Mueller MM, Sperl S, Krüger A, et al. Natural inhibitors of tumor-associated proteases. *Radiol Oncol*. 2002;36(2):131-43.
139. Setyono-Han B, Sturzebecher J, Schmalix WA, Muehlenweg B, Siewerts AM, Timmermans M, et al. Suppression of rat breast cancer metastasis and reduction of primary tumour growth by the small synthetic urokinase inhibitor WX-UK1. *Thromb Haemost*. 2005;93(4):779-86.
140. Tanaka Y, Kobayashi H, Suzuki M, Hirashima Y, Kanayama N, Terao T. Genetic downregulation of pregnancy-associated plasma protein-A (PAPP-A) by bikunin reduces IGF-I-dependent Akt and ERK1/2 activation and subsequently reduces ovarian cancer cell growth, invasion and metastasis. *Int J Cancer*. 2004;109(3):336-47.
141. Devy L, Rabbani SA, Stochl M, Ruskowski M, Mackie I, Naa L, et al. PEGylated DX-1000: pharmacokinetics and antineoplastic activity of a specific plasmin inhibitor. *Neoplasia*. 2007;9(11):927-37.
142. Aggarwal BB, Sundaram C, Prasad S, Kannappan R. Tocotrienols, the vitamin E of the 21st century: its potential against cancer and other chronic diseases. *Biochem Pharmacol*. 2010;80(11):1613-31.

143. Zhou Z, Kevin Robards K, Helliwell S, Blanchard K. The distribution of phenolic acids in rice. *Food Chem.* 2004;87:401–6.
144. Kitisin T, Saewan N, Luplertlop N. Potential anti-inflammatory and anti-oxidative properties of Thai colored-rice extracts. *POJ.* 2015;8(1):69-77.
145. Butsat S, Siriamornpun S. Antioxidant capacities and phenolic compounds of the husk, bran and endosperm of Thai rice. *Food Chem.* 2010;119:606–13.
146. Shen Y, Jin L, Xiao P, Lu Y, Bao J. Total phenolics, flavonoids, antioxidant capacity in rice grain and their relations to grain color, size and weight. *Journal of Cereal Science.* 2009;49:106–11.
147. Min B, Gu L, McClung AM, Bergman CJ, Chen MH. Free and bound total phenolic concentrations, antioxidant capacities, and profiles of proanthocyanidins and anthocyanins in whole grain rice (*Oryza sativa* L.) of different bran colours. *Food Chemistry.* 2012;133:715–22.
148. Min B, McClung A, Chen M. Phytochemicals and antioxidant capacities in rice brans of different color. *J Food Sci.* 2011;76:117-26.
149. Bordiga M, Alonso SG, Locatelli M, Travaglia F, Coisson JD, Gutierrez IH, et al. Phenolics characterization and antioxidant activity of six different pigmented *Oryza sativa* L. cultivars grown in Piedmont (Italy). *Food Research International.* 2014;65:282–90.
150. Walter M, Marchesan E. Phenolic Compounds and Antioxidant Activity of Rice. *Brazilian Archives of Biology and Technology.* 2011;54: 371-7.
151. Goufo P, Trindade H. Rice antioxidants: phenolic acids, flavonoids, anthocyanins, proanthocyanidins, tocopherols, tocotrienols, gamma-oryzanol, and phytic acid. *Food Sci Nutr.* 2014;2(2):75-104.
152. Niu Y, Gao B, Slavin M, Zhang X, Yang F, Bao J, et al. Phytochemical compositions, and antioxidant and anti-inflammatory properties of twenty-two red rice samples grown in Zhejiang. *LWT - Food Science and Technology.* 2013;54:521–7.

153. Sompong R, Siebenhandl-Ehn S, Linsberger-Martin G, Berghofer E. Physicochemical and antioxidative properties of red and black rice varieties from Thailand, China and Sri Lanka. *Food Chemistry*. 2011;124:132–40.
154. Huang SH, Ng LT. An improved high-performance liquid chromatographic method for simultaneous determination of tocopherols, tocotrienols and gamma-oryzanol in rice. *J Chromatogr A*. 2011;1218(29):4709-13.
155. Schwartz H, Ollilainen V, Piironen V, Lampi AM. Tocopherol, tocotrienol and plant sterol contents of vegetable oils and industrial fats. *Journal of Food Composition and Analysis*. 2008;21:152–61.
156. Ahsan H, Ahad A, Iqbal J, Siddiqui WA. Pharmacological potential of tocotrienols: a review. *Nutr Metab (Lond)*. 2014;11(1):52.
157. Qureshi AA, Reis JC, Papasian CJ, Morrison DC, Qureshi N. Tocotrienols inhibit lipopolysaccharide-induced pro-inflammatory cytokines in macrophages of female mice. *Lipids Health Dis*. 2010;9:143.
158. Nesaretnam K, Meganathan P. Tocotrienols: inflammation and cancer. *Ann N Y Acad Sci*. 2011;1229:18-22.
159. Liu HK, Wang Q, Li Y, Sun WG, Liu JR, Yang YM, et al. Inhibitory effects of gamma-tocotrienol on invasion and metastasis of human gastric adenocarcinoma SGC-7901 cells. *J Nutr Biochem*. 2010;21(3):206-13.
160. Yu S, Nehus ZT, Badger TM, Fang N. Quantification of vitamin E and gamma-oryzanol components in rice germ and bran. *J Agric Food Chem*. 2007;55(18):7308-13.
161. Islam MS, Yoshida H, Matsuki N, Ono K, Nagasaka R, Ushio H, et al. Antioxidant, free radical-scavenging, and NF-kappaB-inhibitory activities of phytosteryl ferulates: structure-activity studies. *J Pharmacol Sci*. 2009;111(4):328-37.
162. Yap WN, Chang PN, Han HY, Lee DT, Ling MT, Wong YC, et al. Gamma-tocotrienol suppresses prostate cancer cell proliferation and invasion through multiple-signalling pathways. *Br J Cancer*. 2008;99(11):1832-41.

163. Cho J, Lee H, Kim G, Kim G, Lee Y, Shin S, et al. Quantitative analyses of individual γ -Oryzanol (Steryl Ferulates) in conventional and organic brown rice (*Oryza sativa* L.). *Journal of Cereal Science*. 2012;55:337-43.
164. Pintha K, Yodkeeree S, Pitchakarn P, Limtrakul P. Anti-invasive activity against cancer cells of phytochemicals in red jasmine rice (*Oryza sativa* L.). *Asian Pac J Cancer Prev*. 2014;15(11):4601-7.
165. Iqbal S, Bhangar MI, Anwar F. Antioxidant properties and components of some commercially available varieties of rice bran in Pakistan. *Food Chemistry*. 2005;93(2):265-72.
166. Min B, McClung AM, Chen MH. Phytochemicals and antioxidant capacities in rice brans of different color. *J Food Sci*. 2011;76(1):C117-26.
167. Oki T, Masuda M, Kobayashi M, Nishiba Y, Furuta S, Suda I, et al. Polymeric Procyanidins as Radical-Scavenging Components in Red-Hulled Rice. *Journal of Agricultural and Food Chemistry*. 2002;50(26):7524-9.
168. Lee J, Durst RW, Wrolstad RE. Determination of total monomeric anthocyanin pigment content of fruit juices, beverages, natural colorants, and wines by the pH differential method: collaborative study. *J AOAC Int*. 2005;88(5):1269-78.
169. Tian S, Nakamura K, Cui T, Kayahara H. High-performance liquid chromatographic determination of phenolic compounds in rice. *J Chromatogr A*. 2005;1063(1-2):121-8.
170. Britz SJ, Prasad PV, Moreau RA, Allen LH, Jr., Kremer DF, Boote KJ. Influence of growth temperature on the amounts of tocopherols, tocotrienols, and gamma-oryzanol in brown rice. *J Agric Food Chem*. 2007;55(18):7559-65.
171. Pegg RB, Amarowicz R. Content of tocopherol isomers in oilseed radish cultivars. *Pol J Food Nutr Sci*. 2009;59:129-33.
172. Eccles SA, Box C, Court W. Cell migration/invasion assays and their application in cancer drug discovery. *Biotechnol Annu Rev*. 2005;11:391-421.

173. Dona M, Dell'Aica I, Pezzato E, Sartor L, Calabrese F, Della Barbera M, et al. Hyperforin inhibits cancer invasion and metastasis. *Cancer Res.* 2004;64(17):6225-32.
174. Yodkeeree S, Garbisa S, Limtrakul P. Tetrahydrocurcumin inhibits HT1080 cell migration and invasion via downregulation of MMPs and uPA. *Acta Pharmacol Sin.* 2008;29(7):853-60.
175. Pitchakarn P, Chewonarin T, Ogawa K, Suzuki S, Asamoto M, Takahashi S, et al. Ellagic acid inhibits migration and invasion by prostate cancer cell lines. *Asian Pac J Cancer Prev.* 2013;14(5):2859-63.
176. Yodkeeree S, Wongsirisin P, Pompimon W, Limtrakul P. Anti-invasion effect of crebanine and O-methylbulbocapnine from *Stephania venosa* via down-regulated matrix metalloproteinases and urokinase plasminogen activator. *Chem Pharm Bull (Tokyo).* 2013;61(11):1156-65.
177. Phromnoi K, Yodkeeree S, Anuchapreeda S, Limtrakul P. Inhibition of MMP-3 activity and invasion of the MDA-MB-231 human invasive breast carcinoma cell line by bioflavonoids. *Acta Pharmacol Sin.* 2009;30(8):1169-76.
178. Yodkeeree S, Chaiwangyen W, Garbisa S, Limtrakul P. Curcumin, demethoxycurcumin and bisdemethoxycurcumin differentially inhibit cancer cell invasion through the down-regulation of MMPs and uPA. *J Nutr Biochem.* 2009;20(2):87-95.
179. Mur LA, Mandon J, Cristescu SM, Harren FJ, Prats E. Methods of nitric oxide detection in plants: a commentary. *Plant Sci.* 2011;181(5):509-19.
180. Choi HJ, Eun JS, Park YR, Kim DK, Li R, Moon WS, et al. Ikarisoside A inhibits inducible nitric oxide synthase in lipopolysaccharide-stimulated RAW 264.7 cells via p38 kinase and nuclear factor-kappaB signaling pathways. *Eur J Pharmacol.* 2008;601(1-3):171-8.
181. Oh YC, Cho WK, Im GY, Jeong YH, Hwang YH, Liang C, et al. Anti-inflammatory effect of Lycium Fruit water extract in lipopolysaccharide-stimulated RAW 264.7 macrophage cells. *Int Immunopharmacol.* 2012;13(2):181-9.

182. Hsieh MC, Shen YJ, Kuo YH, Hwang LS. Antioxidative activity and active components of longan (*Dimocarpus longan* Lour.) flower extracts. *J Agric Food Chem.* 2008;56(16):7010-6.
183. Pérez-Jiménez J, Arranz S, Saura-Calixto F. Proanthocyanidin content in foods is largely underestimated in the literature data: An approach to quantification of the missing proanthocyanidins. *Food Res Int.* 2009;42(10):1381-8.
184. Banjerdpongchai R, Wudtiwai B, Sringarm K. Cytotoxic and apoptotic-inducing effects of purple rice extracts and chemotherapeutic drugs on human cancer cell lines. *Asian Pac J Cancer Prev.* 2014;14(11):6541-8.
185. Yodkeeree S, Ampasavate C, Sung B, Aggarwal BB, Limtrakul P. Demethoxycurcumin suppresses migration and invasion of MDA-MB-231 human breast cancer cell line. *Eur J Pharmacol.* 2010;627(1-3):8-15.
186. Chambers AF, Groom AC, MacDonald IC. Dissemination and growth of cancer cells in metastatic sites. *Nat Rev Cancer.* 2002;2(8):563-72.
187. Fingleton B. Matrix metalloproteinase inhibitors for cancer therapy: the current situation and future prospects. *Expert Opin Ther Targets.* 2003;7(3):385-97.
188. Zeng YW, Yang JZ, Pu XY, Du J, Yang T, Yang SM, et al. Strategies of functional food for cancer prevention in human beings. *Asian Pac J Cancer Prev.* 2013;14(3):1585-92.
189. Moko EM, Purnomo H, Kusnadi J, Ijong FG. Phytochemical content and antioxidant properties of colored and non colored varieties of rice bran from Minahasa, North Sulawesi, Indonesia. *International Food Research Journal.* 2014;21:1053-9.
190. Chakuton K, Puangpronpitag D, Nakornriab M. Phytochemical content and antioxidant activity of colored and non-colored Thai rice cultivars. *Asian Journal of Plant Sciences.* 2012;11:285-93.
191. Saenkod C, Liu Z, Huang J, Gong Y. Anti-oxidative biochemical properties of extracts from some Chinese and Thai rice varieties. *African Journal of Food Science.* 2013;7:300-5.

192. Chen HH, Chiu TH. Phytochemicals characterization of solvent extracts from taro-scented japonica rice bran. *J Food Sci.* 2011;76(4):C656-62.
193. Lai P, Li KY, Lu S, Chen HH. Phytochemicals and antioxidant properties of solvent extracts from Japonica rice bran. *Food Chemistry.* 2009;117(3):538-44.
194. Fasahat P, Abdullah A, Muhammad K, Karupaiah T, Ratnam W. Red Pericarp Advanced Breeding Lines Derived from *Oryza Rufipogon* × *Oryza Sativa*: Physicochemical Properties, Total Antioxidant Activity, Phenolic Compounds and Vitamin E Content. *Advance Journal of Food Science and Technology.* 2012;4:155-65.
195. Xu Z, Godber JS. Purification and identification of components of gamma-oryzanol in rice bran Oil. *J Agric Food Chem.* 1999;47(7):2724-8.
196. Esterbauer H, Ramos P. Chemistry and pathophysiology of oxidation of LDL. *Rev Physiol Biochem Pharmacol.* 1996;127:31-64.
197. Henderson AJ, Ollila CA, Kumar A, Borresen EC, Raina K, Agarwal R, et al. Chemopreventive properties of dietary rice bran: current status and future prospects. *Adv Nutr.* 2012;3(5):643-53.
198. Manu KA, Shanmugam MK, Ramachandran L, Li F, Fong CW, Kumar AP, et al. First evidence that gamma-tocotrienol inhibits the growth of human gastric cancer and chemosensitizes it to capecitabine in a xenograft mouse model through the modulation of NF-kappaB pathway. *Clin Cancer Res.* 2012;18(8):2220-9.
199. Tsai CM, Yen GC, Sun FM, Yang SF, Weng CJ. Assessment of the anti-invasion potential and mechanism of select cinnamic acid derivatives on human lung adenocarcinoma cells. *Mol Pharm.* 2013;10(5):1890-900.
200. Lirdprapamongkol K, Kramb JP, Suthiphongchai T, Surarit R, Srisomsap C, Dannhardt G, et al. Vanillin suppresses metastatic potential of human cancer cells through PI3K inhibition and decreases angiogenesis in vivo. *J Agric Food Chem.* 2009;57:3055-63.
201. Sun Q, Prasad R, Rosenthal E, Katiyar SK. Grape seed proanthocyanidins inhibit the invasive potential of head and neck cutaneous squamous cell

- carcinoma cells by targeting EGFR expression and epithelial-to-mesenchymal transition. *BMC Complement Altern Med.* 2011;11:134.
202. Labarbe B, Cheynier V, Brossaud F, Souquet JM, Moutounet M. Quantitative fractionation of grape proanthocyanidins according to their degree of polymerization. *J Agric Food Chem.* 1999;47(7):2719-23.
203. Jerez M, Sineiro J, Guitian E, Nunez MJ. Identification of polymeric procyanidins from pine bark by mass spectrometry. *Rapid Commun Mass Spectrom.* 2009;23(24):4013-8.
204. Hellstrom JK, Mattila PH. HPLC determination of extractable and unextractable proanthocyanidins in plant materials. *J Agric Food Chem.* 2008;56(17):7617-24.
205. Tsang C, Auger C, Mullen W, Bornet A, Rouanet JM, Crozier A, et al. The absorption, metabolism and excretion of flavan-3-ols and procyanidins following the ingestion of a grape seed extract by rats. *Br J Nutr.* 2005;94(2):170-81.
206. Dinicola S, Pasqualato A, Cucina A, Coluccia P, Ferranti F, Canipari R, et al. Grape seed extract suppresses MDA-MB231 breast cancer cell migration and invasion. *Eur J Nutr.* 2014;53(2):421-31.
207. Lewandowska U, Szewczyk K, Owczarek K, Hrabec Z, Podsedek A, Sosnowska D, et al. Procyanidins from evening primrose (*Oenothera paradoxa*) defatted seeds inhibit invasiveness of breast cancer cells and modulate the expression of selected genes involved in angiogenesis, metastasis, and apoptosis. *Nutr Cancer.* 2013;65(8):1219-31.
208. Streck M, Gorlach S, Podsedek A, Sosnowska D, Koziolkiewicz M, Hrabec Z, et al. Procyanidin oligomers from Japanese quince (*Chaenomeles japonica*) fruit inhibit activity of MMP-2 and MMP-9 metalloproteinases. *J Agric Food Chem.* 2007;55(16):6447-52.
209. Matchett MD, MacKinnon SL, Sweeney MI, Gottschall-Pass KT, Hurta RA. Blueberry flavonoids inhibit matrix metalloproteinase activity in DU145 human prostate cancer cells. *Biochem Cell Biol.* 2005;83(5):637-43.

210. Andres SA, Edwards AB, Wittliff JL. Expression of urokinase-type plasminogen activator (uPA), its receptor (uPAR), and inhibitor (PAI-1) in human breast carcinomas and their clinical relevance. *J Clin Lab Anal.* 2012;26(2):93-103.
211. Palmirotta R, Ferroni P, Savonarola A, Martini F, Ciatti F, Laudisi A, et al. Prognostic value of pre-surgical plasma PAI-1 (plasminogen activator inhibitor-1) levels in breast cancer. *Thromb Res.* 2009;124(4):403-8.
212. Aune G, Stunes AK, Lian AM, Reseland JE, Tingulstad S, Torp SH, et al. Circulating interleukin-8 and plasminogen activator inhibitor-1 are increased in women with ovarian carcinoma. *Results Immunol.* 2012;2:190-5.
213. Praus M, Collen D, Gerard RD. Both u-Pa inhibition and vitronectin binding by plasminogen activator inhibitor 1 regulate HT1080 fibrosarcoma cell metastasis. *International Journal of Cancer.* 2002;102:584-91.
214. Meryet FM, Resina S, Lavigne C, Barlovatz MG, Lebleu B, Thierry AR. Inhibition of PAI-1 expression in breast cancer carcinoma cells by siRNA at nanomolar range. *Biochimie.* 2007;89:1228-33.
215. Sandra D, Radha M, Harishkumar M, Yuichi N, Sayuri O, Masugi M. Downregulation of urokinase-type plasminogen activator and plasminogen activator inhibitor-1 by grape seed proanthocyanidin extract. *Phytomedicine.* 2010;17(1):42-6.
216. Kobayashi H, Boelte KC, Lin PC. Endothelial cell adhesion molecules and cancer progression. *Curr Med Chem.* 2007;14(4):377-86.
217. Schroder C, Witzel I, Muller V, Krenkel S, Wirtz RM, Janicke F, et al. Prognostic value of intercellular adhesion molecule (ICAM)-1 expression in breast cancer. *J Cancer Res Clin Oncol.* 2011;137(8):1193-201.
218. Kalin R, Righi A, Del Rosso A, Bagchi D, Generini S, Cerinic MM, et al. Activin, a grape seed-derived proanthocyanidin extract, reduces plasma levels of oxidative stress and adhesion molecules (ICAM-1, VCAM-1 and E-selectin) in systemic sclerosis. *Free Radic Res.* 2002;36(8):819-25.

219. Wang Y, Li L, Guo X, Jin X, Sun W, Zhang X, et al. Interleukin-6 signaling regulates anchorage-independent growth, proliferation, adhesion and invasion in human ovarian cancer cells. *Cytokine*. 2012;59(2):228-36.
220. Choi YK, Cho SG, Woo SM, Yun YJ, Park S, Shin YC, et al. Herbal extract SH003 suppresses tumor growth and metastasis of MDA-MB-231 breast cancer cells by inhibiting STAT3-IL-6 signaling. *Mediators Inflamm*. 2014;2014:492173.
221. Aggarwal BB, Shishodia S. Molecular targets of dietary agents for prevention and therapy of cancer. *Biochem Pharmacol*. 2006;71(10):1397-421.
222. Uchino R, Madhyastha R, Madhyastha H, Dhungana S, Nakajima Y, Omura S, et al. NFkappaB-dependent regulation of urokinase plasminogen activator by proanthocyanidin-rich grape seed extract: effect on invasion by prostate cancer cells. *Blood Coagul Fibrinolysis*. 2010;21(6):528-33.



ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved

LIST OF PUBLICATIONS

- 1) Pintha K., Yodkeeree S., Limtrakul P. Proanthocyanidin in Red Rice Inhibits MDA-MB-231 Breast Cancer Cell Invasion via the Expression Control of Invasive Proteins. *Biological and Pharmaceutical Bulletin*. 2015;38(4):571-81
- 2) Pintha K., Yodkeeree S., Pitchakarn P., Limtrakul P. Anti-invasive Activities Against Cancer Cells of Phytochemicals in Red Jasmine Rice (*Oryza sativa* L.). *Asian Pacific Journal of Cancer Prevention*. 2014;15(11),4601-4607.
- 3) Umsumarng, S., Pintha, K., Pitchakarn, P., Sastraruji, K., Sastraruji, T., Ung, A.T., Jatisatienr, A., Pyne, S.G., Limtrakul, P. Inhibition of P-glycoprotein mediated multidrug resistance by stemofoline derivatives. *Chemical and Pharmaceutical Bulletin*. 2013;61(4):399-404.
- 4) Pitchakarn P, Ohnuma S, Pintha K, Pompimon W, Ambudkar SV, Limtrakul P. Kuguacin J isolated from *Momordica charantia* leaves inhibits P-glycoprotein (ABCB1)-mediated multidrug resistance. *The Journal of Nutritional Biochemistry*. 2012;23:76-84.

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved