

### 本刊介绍 Intro

- [▶ 历史沿革](#)
- [▶ 基本信息](#)
- [▶ 所获奖项](#)
- [▶ 栏目设置](#)
- [▶ 引证报告](#)
- [▶ 顾问委员会](#)
- [▶ 编辑委员会](#)
- [▶ 刊务委员会](#)
- [▶ 编辑部](#)

### 投稿指南 Guide

- [▶ 投稿须知](#)
- [▶ 在线投稿](#)
- [▶ 稿件查询](#)
- [▶ 录用公告](#)

### 广告发行 Ad

- [▶ 订阅发行](#)
- [▶ 在线订阅](#)
- [▶ 广告刊登](#)

### 相关链接 Links

- [▶ 凌昌全名中医工作室](#)
- [▶ 长海医院中医科](#)
- [▶ 第二军医大学](#)
- [▶ 重庆维普科技期刊数据库](#)
- [▶ 国家自然科学基金委员会](#)
- [▶ Google](#)
- [▶ 百度](#)
- [▶ CONSORT](#)
- [▶ 第二军医大学中医系](#)
- [▶ 上海市中西医结合学会](#)

标题：透明颤菌血红蛋白研究现状及其在中药中的应用展望

[\[HTM下载\]](#) [\[PDF下载\]](#) [\[英文版\]](#) [\[下一篇\]](#) [\[本期目次\]](#)

作者：

胡之璧 (上海中医药大学中药研究所 上海 201203 E-mail: [huzhibi@hotmail.com](mailto:huzhibi@hotmail.com))

期刊信息：《中西医结合学报》2005年，第3卷，第5期，第337-341页

DOI: 10.3736/jcim20050501

欢迎阅读《中西医结合学报》！您是该文第 **1079** 位读者！

若需在您的论文中引用此文，请按以下格式著录参考文献：

中文著录格式:	胡之璧. 透明颤菌血红蛋白研究现状及其在中药中的应用展望. 中西医结合学报. 2005; 3(5): 337-341.
英文著录格式:	Hu ZB. Current research status of Vitreoscilla hemoglobin and the prospective application in traditional Chinese medicine. J Chin Integr Med / Zhong Xi Yi Jie He Xue Bao. 2005; 3(5): 337-341.

参考文献：

1	Hardison R. Hemoglobins from bacteria to man: evolution of different patterns of gene expression[J].Exp Biol, 1998, 201(Pt 8): 1099-1117. .
2	Tyree B, Webster DA. The binding of cyanide and carbon monoxide to cytochrome o purified from Vitreoscilla. Evidence for subunit interaction in the reduced protein[J].J Biol Chem, 1978, 253(19): 6988-6991. .
3	Choc MG, Webster DA, Caughey WS. Oxygenated intermediate and carbonyl species of cytochrome o (Vitreoscilla) characterization by infrared spectroscopy[J].J Biol Chem, 1982, 257(2): 865-869. .
4	DeMaio RA, Webster DA, Chance B. Spectral evidence for the existence of a second cytochrome o in whole cells of Vitreoscilla[J].J Biol Chem, 1983, 258(22): 13768-13771. .
5	Orii Y, Webster DA. Photodissociation of oxygenated cytochrome o(s) (Vitreoscilla) and kinetic studies of reassociation[J].J Biol Chem, 1986, 261(8): 3544-3547. .
6	Wakabayashi S, Matsubara H, Webster DA. Primary sequence of a dimeric bacterial hemoglobin from Vitreoscilla[J].Nature, 1986, 322(6078): 481-483. .
7	Tarricone C, Galizzi A, Coda A, et al. Unusual structure of the oxygen-binding site in the dimeric bacterial hemoglobin from Vitreoscilla sp[J].Structure, 1997, 5(4): 497-507. .
8	Kuhse J, Puhler A. Conserved sequence motifs in the untranslated 3' end of leghemoglobin transcripts isolated from broadbean nodules[J].Plant Sci, 1987, 49(2): 137-143. .
9	Dikshit KL, Orii Y, Navani N, et al. Site-directed mutagenesis of bacterial hemoglobin: the role of glutamine (E7) in oxygen-binding in the distal heme pocket[J].Arch Biochem Biophys, 1998, 349(1): 161-166. .
10	Verma S, Patel S, Kaur R, et al. Mutational study of the bacterial hemoglobin distal heme pocket[J].Biochem Biophys Res Commun, 2005, 326(2): 290-297. .

11	Khosla C, Bailey JE. Evidence for partial export of Vitreoscilla hemoglobin into the periplasmic space in Escherichia coli. Implications for protein function[J].J Mol Biol, 1989, 210(1): 79-89. .
12	Ramandeep, Hwang KW, Raje M, et al. Vitreoscilla hemoglobin. Intracellular localization and binding to membranes[J].J Biol Chem, 2001, 276(27): 24781-24789. .
13	Dikshit KL, Webster DA. Cloning, characterization and expression of the bacterial globin gene from Vitreoscilla in Escherichia coli[J].Gene, 1988, 70(2): 377-386. .
14	Khosla C, Bailey JE. The Vitreoscilla hemoglobin gene: molecular cloning, nucleotide sequence and genetic expression in Escherichia coli[J].Mol Gene Genet, 1988, 214(1): 158-161. .
15	Khosla C, Bailey JE. Characterization of the oxygen-dependent promoter of the Vitreoscilla hemoglobin gene in Escherichia coli[J].J Bacteriol, 1989, 171(11): 5995-6004. .
16	Dikshit KL, Spaulding D, Braun A, et al. Oxygen inhibition of globin gene transcription and bacterial haemoglobin synthesis in Vitreoscilla[J].J Gen Microbiol, 1989, 135(10): 2601-2609. .
17	Tsai PS, Kallio PT, Bailey JE. Fnr, a global transcriptional regulator of Escherichia coli, activates the Vitreoscilla hemoglobin (VHb) promoter and intracellular VHb expression increases cytochrome d promoter activity[J].Biotechnol Prog, 1995, 11(3): 288-293. .
18	Khosla C, Curtis JE, Bydalek P, et al. Expression of recombinant proteins in Escherichia coli using an oxygen-responsive promoter[J].Biotechnology (NY), 1990, 8(6): 554-558. .
19	吴奕, 杨胜利. 透明颤菌血红蛋白基因调控与功能的研究[J].生物工程学报, 1997, 13(1): 1-5. .
20	Tsai PS, Nageli M, Bailey JE. Intracellular expression of Vitreoscilla hemoglobin modifies microaerobic Escherichia coli metabolism through elevated concentration and specific activity of cytochrome c[J].Biotechnol Bioeng, 2002, 79(5): 558-567. .
21	Tsai PS, Hatzimanikatis V, Bailey JE. Effect of Vitreoscilla hemoglobin dosage on microaerobic Escherichia coli carbon and energy metabolism[J].Biotechnol Bioeng, 1996, 49: 139-150. .
22	Tsai PS, Rao G, Bailey JE. Improvement of Escherichia coli microaerobic oxygen metabolism by Vitreoscilla hemoglobin: new insights from NAD(P)H fluorescence and culture redox potential[J].Biotechnol Bioeng, 1995, 47(3): 347-354. .
23	Khosla C, Curtis JE, DeModena J, et al. Expression of intracellular hemoglobin improves protein synthesis in oxygen-limited Escherichia coli[J].Biotechnology, 1990, 8(9): 849-853. .
24	孙禄. 日本药用植物生物技术的研究进展[J].特产研究, 1998, 20(3): 43-46. .
25	郑志仁, 彭佶松, 刘涤, 等. 黄芪毛状根的大量培养[J].植物生理学通讯, 1997, 33(2): 133-134. .
26	Kallio PT, Bailey JE. Intracellular expression of Vitreoscilla hemoglobin (VHb) enhances total protein secretion and improves the production of alpha-amylase and neutral protease in Bacillus subtilis[J].Biotechnol Prog, 1996, 12(1): 31-39. .
27	Nilsson M, Kallio PT, Bailey JE, et al. Expression of Vitreoscilla hemoglobin in Escherichia coli enhances ribosome and tRNA levels: a flow field-flow fractionation study [J].Biotechnol Prog, 1999, 15(2): 158-163. .
28	Magnolo S K, Leenutaphong D L, Demodena J A , et al. Actinorhodin production by Streptomyces coelicolor and growth of Streptomyces lividans are improved by the expression of a bacterial hemoglobin[J].Biotechnology (N Y), 1991, 9(5): 473-476. .
29	DeModena JA, Gutierrez S, Velasco J. The production of cephalosporin C by Acremonium chrysogenum is improved by the intracellular expression of a bacterial hemoglobin [J].Biotechnology (N Y), 1993, 11(8): 926-929. .
30	Patel SM, Stark BC, Hwang KW, et al. Cloning and expression of Vitreoscilla hemoglobin gene in Burkholderia sp. strain DNT for enhancement of 2,4-dinitrotoluene degradation [J].Biotechnol Prog, 2000, 16(1): 26-30. .
31	文莹, 宋渊, 李季伦. 透明颤菌血红蛋白在肉桂地链霉菌中的表达对其细胞生长及抗生素合成的影响[J].生物工程学报, 2001, 17(1): 24-28. .
32	Bhave SL, Chattoo BB. Expression of Vitreoscilla hemoglobin improves growth and levels of extracellular enzyme in Yarrowia lipolytica[J].Biotechnol Bioeng, 2003, 84(6): 658-666. .
33	Pendse GJ, Bailey JE. Effect of Vitreoscilla hemoglobin expression on growth and specific

	tissue plasminogen-activator productivity in recombinant Chinese hamster ovary cells [J].Biotechnol Bioeng, 1994, 44(11): 1367-1370. .
34	Holmberg N, Lilius G, Bailey JE, et al. Transgenic tobacco expressing Vitreoscilla hemoglobin exhibits enhanced growth and altered metabolite production[J].Nat Biotechnol, 1997, 15(3): 244-247. .
35	Bailey JE. Toward a science of metabolic engineering[J].Science, 1991, 252(5013): 1668-1675. .
36	Farres J, Kallio PT. Improved cell growth in tobacco suspension cultures expressing Vitreoscilla hemoglobin[J].Biotechnol Prog, 2002, 18(2): 229-233. .
37	Frey AD, Kallio PT. Nitric oxide detoxification--a new era for bacterial globins in biotechnology?[J].Trends Biotechnol, 2005, 23(2): 69-73. .
38	Li X, Peng RH, Fan HQ, et al. Vitreoscilla hemoglobin overexpression increases submergence tolerance in cabbage[J].Plant Cell Rep, 2005, 23(10-11): 710-715. .
39	熊爱生, 彭日荷, 陈建民, 等. 透明颤菌血红蛋白(VHb)基因合成及原核生物中的效应[J].上海农业学报, 2000, 16(3): 19-24. .
40	Wilhelmson A, Kallio PT, Oksman-Caldentey KM, et al. Expression of Vitreoscilla hemoglobin enhances growth of Hyoscyamus muticus hairy root cultures[J].Planta Med, 2005, 71(1): 48-53. .

ISSN 1672-1977 CN 31-1906/R CODEN ZJXHAY

·Copyright © 2003-2008 中西医结合学报杂志社 All Rights Reserved

·地址: 上海市长海路174号科技楼1105室 邮政编码: 200433

·联系电话(传真): 021-81873540

·电子邮件: [jcim@smmu.edu.cn](mailto:jcim@smmu.edu.cn)

