

## เอกสารอ้างอิง

- กมลวรรณ เจริญศักดิ์. 2540. รายงานการศึกษานานาชาติพิเศษตามหลักสูตรปริญญาตรีวิทยาศาสตร์บัณฑิต เรื่องการศึกษาเอนไซม์ Superoxide dismutase (SOD) ในใบยาง. คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ วิทยาเขตหาดใหญ่.
- กรีช สัตถาผล, สุพร นุชดำรงค์, เกษม สร้อยทอง, สมเดช กนกเมธากุล และ ขวัญใจ กนกเมธากุล. 2540. การเปลี่ยนรูปไอโซไซม์ของซูเปอร์ออกไซด์ดิสมิวเตสตามระยะการเจริญและอุณหภูมิการเพาะเลี้ยงเชื้อ *Chaetomium globosum* การประชุมวิชาการ วิทยาศาสตร์และเทคโนโลยีแห่งประเทศไทย (วทท.) ครั้งที่ 23 ณ. โดดส์ ปางสวนแก้ว เชียงใหม่. หน้า 530-531.
- ฉวีวรรณ อุณหงศ์. 2541. รายงานการศึกษานานาชาติพิเศษตามหลักสูตรปริญญาตรีวิทยาศาสตร์บัณฑิต เรื่องการศึกษาเอนไซม์ Superoxide dismutase (SOD) ในใบยาง. คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ วิทยาเขตหาดใหญ่.
- พัชรากร รัตนภูมิ. 2543. เอนไซม์เปอร์ออกซิเดสในใบยางพารา วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต มหาวิทยาลัยสงขลานครินทร์.
- สมพงษ์ สุขมาก. 2536. การปรับปรุงพันธุ์ยางพารา. เอกสารวิชาการเรื่องยาง. สถาบันวิจัยยาง กรมวิชาการเกษตร กระทรวงเกษตรและสหกรณ์.
- สุพร นุชดำรงค์, อัจฉรา ธรรมถาวร และสุรศักดิ์ แซ่เต็ง. 2536. ผลกระทบของความเค็มต่อการงอก การเจริญ และรูปแบบของเอนไซม์ซูเปอร์ออกไซด์ดิสมิวเตสในต้นกล้าถั่วเขียว *Phaseolus aureus* Robx. การประชุมวิชาการ วิทยาศาสตร์และเทคโนโลยีแห่งประเทศไทย (วทท.) ครั้งที่ 19 ณ. โรงแรม เจ. บี. หาดใหญ่ สงขลา. หน้า 616-617.

- สุพัตรา ปรศุพัฒนา และอุดม จันทราภรณ์ศรี. 2536 การศึกษาภาวะเครียดออกซิเดชันและระดับ เอนไซม์ Superoxide Dismutase (SOD) ในเลือดจากผู้ป่วยธาลัสซีเมียด้วยวิธี Chemiluminescence. การประชุมวิชาการ วิทยาศาสตร์และเทคโนโลยีแห่งประเทศไทย (วทท.) ครั้งที่ 19 ณ. โรงแรม เจ.บี. หาดใหญ่ สงขลา. หน้า 706-707.
- วรวิทย์ ฉิมเพชร. 2539. รายงานการศึกษาปัญหาพิเศษตามหลักสูตรปริญญาตรี วิทยาศาสตร์บัณฑิต เรื่องการศึกษาเอนไซม์ SOD ในใบยาง. คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ วิทยาเขตหาดใหญ่.
- วัลลี สุวจิตตานนท์ และ คงพัฒน์ พงศ์ไพบุลย์. 2535. รายงานการวิจัยเรื่อง การจำแนกพันธุ์ยางพาราโดยไอโซไซม์อิเล็กโทรฟอรีซิส.
- ธนาคารเพื่อการส่งออกและนำเข้าแห่งประเทศไทย <http://www.exim.go.th/>
- Abe, Y. and Okazaki, T. 1987. Purification and properties of the manganese superoxide dismutase from the liver of bullfrog, *Rana catesbeiana*. *Arch. Biochem. Biophys.* **253** (1): 241-248.
- Almansa, M.S., Palma, J.M., Yanez, J., del Rio, L.A. and Sevilla, F. 1991. Purification of an iron-containing superoxide dismutase from a citrus plant, *Citrus limonum* R. *Free Radic. Res. Commun.* **12-13** (Pt 1): 319-328.
- Amano, A., Shizukuishi, S., Tsunemitsu, A., Maekawa, K. and Tsunasawa, S. 1990. The primary structure of superoxide dismutase purified from anaerobically maintained *Bacteroides gingivalis*. *FEBS Lett.* **272** (1-2): 217-220.
- Asada, K., Urano, M. and Takahashi, M. 1973. Subcellular location of superoxide dismutase in spinach leaves and preparation and properties of crystalline spinach superoxide dismutase. *Eur. J. Biochem.* **36** (1): 257-266.

- Asada, K., Yoshikawa, K., Takahashi, M., Maeda, Y. and Enmanji, K. 1975. Superoxide dismutase from a blue-green alga, *Plectonema boryanum*. *J. Biol. Chem.* **250** (8): 2801-2807.
- Asami, S. and Akazawa, T. 1977. Enzymic formation of glycollate in chromatium. Role of superoxide radical in a transketolase type mechanism. *Biochemistry* **16**: 2202-2207.
- Bannister, J.V., Bannister, W.H. and Rotiolo, G. 1987. Aspects of the Structure, function and applications of superoxide dismutase. *CRC Crit. Rev. Biochem.* **22**: 111-180.
- Barnes, A.C., Horne, M. T. and Ellis, A. E. 1996. Effect of iron on expression of superoxide dismutase by *Aeromonas salmonicida* and associated resistance to superoxide anion. *FEMS Microbiol. Letters* **142**: 19-26.
- Barra, D., Schinina, M.E., Bossa, F., Puget, K., Durosay, P., Guissani, A. and Michelson, A. M. 1990. A tetrameric iron superoxide dismutase from the eucaryote *Tetrahymena pyriformis*. *J. Biol. Chem.* **265** (29): 17680-17687.
- Battistoni, A. and Rotilio, C. 1995. Isolation of an active and heat- stable monomeric form of Cu, Zn superoxide dismutase from the periplasmic space of *Escherichia coli*. *FEBS Letter* **374**: 199-202.
- Baum, J.A. and Scandalios, J.G. 1981. Isolation and characterization of the cytosolic and mitochondrial superoxide dismutase of maize. *Arch. Biochem. Biophys.* **206** (2): 249-264.
- Beaman, B.L., Scates, S.M., Moring, S. E., Deem, R. and Misra, H.P. 1983. Purification and properties of a unique superoxide dismutase from *Nocardia asteroides*. *J. Biol. Chem.* **258** (1): 91-96.

- Beckman, R. and Flohe, L. 1981. The pathogenic role of superoxide radicals in inflammation : efficacy of exogenous superoxide dismutase. *Clin. Respir. Physiol.* **17**: 275-286.
- Beauchamp, C.O. and Fridovich, I. 1973. Isozymes of superoxide dismutase from wheat germ. *Biochem. et Biophys. Acta.* **317**: 50-64.
- Beyer, W.F. Jr. and Fridovich, I. 1987. Assaying for superoxide dismutase activity: some large consequences of minor changes in conditions. *Anal. Biochem.* **161**: 559-566.
- Bowler, C., Van Camp, W., Van Montagu, M. and Inze, D. 1994. Superoxide dismutase in plants. *Crit. Rev. Plant Science.* **13 (3)**: 199-218.
- Cakmak, I. and Marschner, H. 1988. Enhanced superoxide radical production in roots of zinc-deficient plants. *J. Exp. Bot.* **39**: 1449-1460.
- Cakmak, I. 1992. Magnesium deficiency and high light intensity enhance activities of superoxide dismutase, ascorbate peroxidase, and glutathione reductase in bean leaves. *Plant Physiol.* **98**: 1222-1227.
- Cannon, R.E., White, J.A. and Scandalios, J.G. 1987. Cloning of cDNA for maize superoxide dismutase 2 (SOD2). *Proc. Natl. Acad. Sci. USA* . **84**:179-183.
- Cannon, R.E. and Scandalios, J.G. 1989. Two cDNAs encode two nearly identical Cu/Zn superoxide dismutase proteins in maize. *Mol. Gen. Genet.* **219**: 1-8.
- Carter, C. and Thornburg, R.W. 2000. Tobacco nectarin I: purification and characterization as a germin-like, manganese superoxide dismutase implicated in the defense of floral reproductive tissues. *J. Biol. Chem.* **275 (47)**: 36726-36733.

- Cassell, R. H. and Fridovich, I. 1975. Role of superoxide radical in the autoxidation of cytochrome c. *Biochemistry* **14**: 1866-1869.
- Chen, J.R., Weng, C.N., Ho, T.Y., Cheng, I.C. and Lai, S.S. 2000. Identification of the copper-zinc superoxide dismutase activity in *Mycoplasma hyopneumoniae*. *Vet. Microbiol.* **73** (4): 301-310.
- Choi, D.H., Na, B.K., Seo, M.S., Song, H.R. and Song, C.Y. 2000. Purification and characterization of iron superoxide dismutase and copper-zinc superoxide dismutase from *Acanthamoeba castellanii*. *J. Parasitol.* **86** (5): 899-907.
- Chongpraditnun, P., Mori, S. and Chino, M. 1992. Excess copper induces a cytosolic Cu,Zn-superoxide dismutase in soybean root. *Plant Cell Physiol.* **33**: 239-244.
- Chrestin, H. 1989. Biochemical aspects of bark dryness induced by over stimulation of rubber trees with ethrel. In d' Azumac J, Jacob J-L, Chrestin, H (eds), *Physiology of Rubber Tree Latex* pp. 431-442. CRC Press, Florida.
- Cohen, G. and Heikila, R. 1974. The generation of hydrogen peroxide, superoxide radical and hydrogen radical by 6-hydroxydopamine, dialuric acid and related cytotoxic agents. *J. Biol. Chem.* **249** : 2447-2452.
- Copin, J-C., Gasche, Y., Li, Y. and Chan, P.H. 2001. Prolonged hypoxia during cell development protects mature manganese superoxide dismutase-deficient astrocytes from damage by oxidative stress. *FASEB* **15**: 525-534.

- Cseke, C., Horvath, L.L., Simon, P., Borbely, G., Keszthelyi, L. and Farkas, G.S. 1979. An iron-containing superoxide dismutase from *Anacystis nidulans*. *Arch. Biochem. Biophys. (Tokyo)* **195** (2): 1397-1404.
- Cudd, A. and Fridovich, I. 1982. Electrostatic interactions in the reaction mechanism of bovine erythrocyte superoxide dismutase. *J. Biol. Chem.* **257** (11): 11443-11447.
- Davis, B.J. 1964. Disc electrophoresis II. Method and application to human serum protein. *Ann. N.Y. Acad. Sci.* **121**: 404-427.
- De Leonardis, S., Dipierro, N. and Dipierro, S. 2000. Purification and characterization of an ascorbate peroxidase from potato tuber mitochondria. *Plant Physiol. Biochem.* **38**: 773-779.
- Dello, A.R., Rullo, R., Nitti, G., Masullo, M. and Bocchini, V. 1997. Iron superoxide dismutase from the archaeon *Sulfolobus solfataricus*: average hydrophobicity and amino acid weight are involved in the adaptation of proteins to extreme environments. *Biochem. Biophys. Acta.* **1343**: 23-30.
- Diez, B., Schleissner, C., Moreno, M.A., Rodriguez, M., Collados, A. and Barredo, J.L. 1998. The manganese superoxide dismutase from the penicillin producer *Penicillium chrysogenum*. *Curr. Genet.* **33**(6): 387-394.
- Dolashka-Angelova, P., Angelova, M., Genova, L., Stoeva, S. and Voelter, W. 1999. A novel Cu, Zn superoxide dismutase from the fungal strain *Humicola lutea* 110 : isolation and physico-chemical characterization. *Spectrochimica Acta Part A: Mol. and Biomol. Spect.* **55** (11): 2249-2260.

- Dos Santos, W.G., Pacheco, I., Liu, M.Y., Teixeira, M., Xavier, A.V. and LeGall, J. 2000. Purification and characterization of an iron superoxide dismutase and a catalase from the sulfate-reducing bacterium *Desulfovibrio gigas*. *J. Bacteriol.* **182** (3): 796-804.
- Duke, M.V. and Salin, M.L. 1983. Isozymes of cuprozinc superoxide dismutase from *Pisum sativum*. *Phytochemistry* **22** (11): 369-2373.
- Duke, M.V. and Salin, M.L. 1985. Purification and characterization of an iron-containing superoxide dismutase from a eucaryote, *Gingko biloba*. *Arch. Biochem. Biophys.* **243** (1): 305-314.
- Elstner, E.F. and Heupel, A. 1976. Inhibition of nitrite formation from hydroxyl ammonium chloride: simple assay for superoxide dismutase. *Anal. Biochem.* **70**: 616-620.
- Francis, J.W., Ren, J., Warren, L., Brown, R.H.Jr. and Finklestein, S.P. 1997. Postischemic infusion of Cu/Zn superoxide dismutase or SOD : Tet451 reduces cerebral infraction following focal ischemia/ reperfusion in rats. *Exp. Neurol.* **146** (2): 435-443.
- Fridovich, I. 1983. Superoxide Radical: An Endogenous Toxicant. *Annu. Rev. Pharmacol. Toxicol.* **23**: 239-257.
- Fridovich, I. 1989. Superoxide dismutases: an adaptation to a paramagnetic gas. *J. Biol. Chem.* **264**: 7761-7764.
- Fridovich, I. 1995. Superoxide radical and superoxide dismutases. *Annu. Rev. Biochem.* **64**: 97-112.
- Fridovich, I. 1997. Superoxide anion radical ( $O_2^-$ ), superoxide dismutases, and related matters. *J. Biol. Chem.* **272** (30): 18515-18517.

- Foyer, C.H. and Harbinson, J. 1999. Relationships between antioxidant metabolism and carotenoids in the regulation of photosynthesis" The photochemistry of carotenoids, 305-325. Kluwer Academic Publishers, Netherlands.
- Gebicki, J.M. and Bielski, B.H.J. 1981. Comparison of the capacities of the perhydroxyl radical and the superoxide radicals to initiate chain oxidation of linoleic acid. *J. Am. Chem. Soc.* **103**: 7020-7022.
- Gotoh, T. and Shikama, K. 1976. Generation of the superoxide radical during the autoxidation of oxymyoglobin. *J. Biochem.* **80**: 397-399.
- Greenstock, C.L. and Miller, R.W. 1975. The oxidation of tiron by superoxide anion. Kinetics of the reaction in aqueous solution and in chloroplasts *Biochim. Biophys. Acta.* **396**: 11-16.
- Gregory, E.M. and Fridovich, I. 1973. The induction of superoxide dismutase by molecular oxygen. *J. Bacteriol.* **114**: 543-548.
- Hakamada, Y., Koike, K., Kobayashi, T. and Ito, S. 1997. Purification and properties of manganese-superoxide dismutase from a strain of alkaliphilic *Bacillus*. *Extremophiles* **1**: 74-78.
- Halliwell, B., and Gutteridge, J.M.C. 1989. Protection against oxidants in biological systems: the superoxide theory of oxygen toxicity. *Free Radicals in Biology and Medicine* (2<sup>nd</sup> ed), 543 pp. Clarendon Press, Oxford.
- Hassan, H.M., Dougherty, H. and Fridovich, I. 1980. Inhibitors of superoxide dismutases: a cautionary tale. *Arch. Biochem. Biophys.* **199** (2): 349-354.



- Hatzinikolaou, D.G., Tsoukia, C., Kekos, D. and Macris, B.J. 1997. An efficient and optimized purification procedure for the superoxide dismutase from *Aspergillus niger*. Partial characterization of the purified enzyme. *Bioseparation* **7** (1): 39-46.
- Hernandez, J.A., Olmos, E., Corpas, F.J., Sevilla, F. and Del Rio, L.A. 1995. Salt-induced oxidative stress on chloroplasts of pea plants. *Plant Sci.* **105**: 151-167.
- Hernandez-Saavedra, N.Y. and Ochoa, J.L. 1999. Copper-zinc superoxide dismutase from the marine yeast *Debaryomyces hansenii*. *Yeast* **15** (8): 657-668.
- Hilewicz-Grabska, M., Zgirski, A., Krajewski, T. and Plonka, A. 1988. Purification and partial characterization of goose ceruloplasmin. *Arch. Biochem. Biophys.* **260** (1): 18-27.
- Holdom, M.D., Hay, R.J. and Hamilton, A.J. 1996. The Cu, Zn Superoxide Dismutases of *Aspergillus flavus*, *Aspergillus niger*, *Aspergillus nidulans*, and *Aspergillus terreus*: purification and biochemical comparison with the *Aspergillus fumigatus* Cu,Zn superoxide dismutase. *Infection and Immunity* **64** (8): 3326-3332.
- Hong, Z., Kosman, D.J., Thakur, A., Rekosh, D. and LoVerde, P.T. 1992. Identification and purification of a second form of Cu, Zn superoxide dismutase from *Schistosoma mansoni*. *Infection and Immunity* **60** (9): 3641-3651.
- Horakova, K., Sovcikova, A., Seemannova, Z., Syrova, Dagmar., Busanyova, K., Drobna, Z. and Ferencik, M. 2001. Detection of drug-Induced, superoxide-mediated cell damage and Its prevention by antioxidants. *Free Radic. Biol. & Med.* **30** (6): 650-664.

- Housset, B. and Junod, A.F. 1981. Enzyme response of cultured endothelial cells to hyperoxia. *Bull-Eur. Physiopathol. Respir.* **17**: 107-110.
- Ikeda, K., Matsumi, S., Magara, T. and Nakagawa, S. 1995. Purification and characterization of canine manganese superoxide dismutase and its immunohistochemical localization in canine heart compared with that of copper-zinc superoxide dismutase. *The Intl. J. Biochem. & Cell Biol.* **27 (12)**: 1257-1265.
- Jewett, Sandra L., Rocklin, A.M., Ghanevati, M., Abel, J.M. and Marach, J.A. A new look at a time-worn system : oxidation of CuZn-SOD by  $H_2O_2$ . *Free Radic. Biol. & Med.* **26 (7/8)**:905-918.
- Johnston, J.A., Dalton, M.J., Gurney, M.E. and Kopito, R.R. 2000. Formation of high molecular weight complexes of mutant Cu, Zn-superoxide dismutase in a mouse model for familial amyotrophic lateral sclerosis. *Cell Biol.* **97 (23)**: 12571-12576.
- Kahlos, K., P, P., Kurttila, E., Soini, Y. and Kinnula, V.L. 2000. Manganese superoxide dismutase as a diagnostic marker for malignant pleural mesothelioma. *Br. Cancer* **82 (5)**: 1022-1029.
- Kaminaka, H., Morita, S., Tokumoto, M., Yokoyama, H., Masumura, T. and Tanaka, K. 1999. Molecular cloning and characterization of a cDNA for an iron-superoxide dismutase in rice (*Oryza sativa* L.) *Biosci. Biotechnol. Biochem.* **63 (2)**: 302-308.
- Karpinska, B., Karlsson, M., Schinkel, H., Streller, S., Suss, K-H., Melzer, M. and Wingsle, G. 2001. A novel superoxide dismutase with a high isoelectric point in higher plants. expression, regulation, and protein localization. *Plant Physiol.* **126**: 1668-1677.

- Keele, B.B.Jr., McCord, J.M. and Fridovich, I. 1970. Superoxide dismutase from *Escherichia coli* B. *J. Biol. Chem.* **245** (22): 6176-6181.
- Kim, E.J., Kim, H.P., Hah, Y.C. and Roe, J.H. 1996. Differential expression of superoxide dismutases containing Ni and Fe/Zn in *Streptomyces coelicolor*. *Eur J Biochem* **241**: 178-185.
- Kirby, T.W., Lancaster, J.R. Jr. and Fridovich, I. 1981. Isolation of characterization of the Iron-containing superoxide dismutase of *Methanobacterium bryantii*. *Arch. Biochem. Biophys.* **210** (1): 140-148.
- Kitani, K., Miyasaka, K., Kanai, S., Carrillo, M.C. and Ivy, G.O. 1996. Upregulation of antioxidant enzyme activities by deprenyl. Implications for life span extension. *Ann. N Y Acad. Sci.* **786** (15): 391-409.
- Kitayama, K., Kitayama, M., Osafune, T. and Togasaki, R K. 1999. Subcellular localization of iron and manganese superoxide dismutase in *Chlamydomonas reinhardtii* (Chlorophyceae) *J. Phycol.* **35**: 136-142.
- Kliebenstein, D.J., Monde, R-A. and Last, R.L. 1998. Superoxide dismutase in arabidopsis: an electric enzyme family with disparate regulation and protein localization. *Plant Physiol.* **118**: 637-650.
- Kono, Y., Takahashi, M-A and Asada, K. 1979. Superoxide dismutases from kidney bean leaves. *Plant & Cell Physiol.* **20** (7): 1229-1235.
- Kono, Y. and Fridovich. I. 1982. Superoxide radical inhibits catalase. *J. Biol. Chem.* **257**: 5751-5754.
- Kostron, B., Market D., Kellermann, J., Carter, C.E. and Honegger, H.-W. 1999. Antisera against *Perioplaneta americana* Cu, Zn-superoxide dismutase (SOD): separation of the neurohormone bursicon from SOD, and immunodetection of SOD in the central nervous system. *Insect Biochem. and Mol. Biol.* **29**: 861-871.

- Kou, R., Bai, Y., Yuan, J. and Chu, X. 1997. Purification and some properties of superoxide dismutase from *Fusarium moniliform*. *Wei Sheng Wu Xue Bao* **37** (2): 115-118.
- Kowaltowski, A.J. and Vercesi, A.E. 1999. Mitochondrial damage induced by conditions of oxidative stress. *Free Radic. Biol. Med.* **26**: 463-471.
- Laemmli, U.K. 1970. Cleavage of structural proteins during the assembly of the head of bacteriophage T4. *Nature* **227**: 680-685.
- Lavelle, F., Durosay, P. and Michelson, A.M. 1974. Purification and properties of superoxide dismutase from the fungus *Pleurotus olearius*. *Biochim.* **56** (3): 451-458.
- Le Trant, N., Meshnick, S.R., Kitchener, K., Eaton, J.W. and Cerami, A. 1983. Iron-containing superoxide dismutase from *Crithidia fasciculata*. Purification, characterization, and similarity to leishmanial and trypanosomal enzymes. *J. Biol. Chem.* **258** (1): 125-130.
- Lee, Y.M., Ayala, F.J. and Misra, H.P. 1981. Purification and properties of superoxide dismutase from *Drosophila melanogaster*. *J. Biol. Chem.* **256** (16): 8506-8507.
- Liochev, S.I., Kuchumov, A.R., Vinogradov, S.N. and Frodivich, I. 1996. Superoxide dismutase activity in the giant hemoglobin of the earthworm, *Lumbricus terrestris*. *Arch. Biochem. and Biophys.* **330** (2): 281-284.
- Lowry, O.H., Rosebrough, N.J., Farr, A.L. and Randall, R.J. 1951. Protein measurement with the folin-phenol reagent. *J. Biol Chem.* **193**: 265-275.

- Lumsden, J. and Hall, D.O. 1974. Soluble & membrane-bound superoxide dismutases in a blue-green alga (*Spirulina*) and spinach. *Biochem. Biophys. Res. Comm.* **8** (1): 35-41.
- Lynch, R.E., Lee, G.R., Cartwright, G.E. 1976. Inhibition by superoxide dismutase of methemoglobin formation from oxyhemoglobin. *J. Biol. Chem.* **251**: 1015-1019.
- Lynen, F. 1969. Biochemical problem of rubber synthesis. *J. Rubb. Res. Inst. Malaya.* **21** (4): 389-406.
- Ma, E-P., Liu, X-Z., Liu, M-D., Han, Y., Liu, X. and Wu, Z-Z. 1998. The effect of superoxide dismutase on the recovery of human bone marrow hemopoietic stem cells stored at 4°C. *Cryobiol.* **37** (4): 372-375.
- Manohar, M. and Balasubramanian, K.A. 1991. Studies on cytosolic superoxide dismutase from intestine mucosa. *Indian J. Biochem Biophys.* **28** (1): 52-57.
- Marklund, S. and Marklund, G. 1974. Involvement of the superoxide anion radical in the autoxidation of pyrogallol and a convenient assay for superoxide dismutase. *Eur. J. Biochem.* **47**: 469-474.
- Matsumoto, T., Terauchi, K., Isobe, T., Matsuoka, K. and Yamakura, F. 1991. Iron and manganese containing superoxide dismutase from methylomonas : Identity of the protein moiety and amino acid sequence. *Biochem.* **30**: 3210-3216.
- McCord, J.M. and Fridovich, I. 1969a. Superoxide dismutase : an enzyme function for erythrocyte hemocuprein (hemocuprein). *J. Biol. Chem.* **244** (22): 6049-6055.
- McCord, J.M. and Fridovich, I. 1969b. The utility of superoxide dismutase in studying free radical reactions. *J. Biol. Chem.* **244** (22): 6056-6063.

- McCord, J.M. 1976. Iron- and manganese-containing superoxide dismutases: structure, distribution, and evolutionary relationships. *Adv. Exp. Med. Biol.* **74**: 540-550.
- Miao, Z. and Gaynor, J.J. 1993. Molecular cloning, characterization and expression of Mn-superoxide dismutase from the rubber tree (*Hevea brasiliensis*). *Plant Mol. Biol.* **23**: 267-277.
- Mishra, N.P., Fatma, T. and Singhal, G.S. 1995. Development of antioxidant defence system of wheat seedlings in response to high light. *Physiol. Plant.* **95**: 77-82.
- Misra, H.P. and Fridovich, I. 1971. The generation of superoxide radical during the autoxidation of ferredoxins. *J. Biol. Chem.* **246**: 6886-6890.
- Misra, H.P. and Fridovich, I. 1972a. The generation of superoxide radical during the autoxidation of hemoglobin. *J. Biol. Chem.* **247**: 6960-6962.
- Misra, H.P. and Fridovich, I. 1972b. The role of superoxide anion in the autoxidation of epinephrine and a simple assay for superoxide dismutases. *J. Biol. Chem.* **247**: 3170-3175.
- Misra, H.P. and Fridovich, I. 1976. The oxidation of phenylhydrazine: superoxide and mechanism. *Biochemistry* **14** : 681-687.
- Misra, H.P. and Fridovich, I. 1977. Purification and properties of superoxide dismutase from a red alga, *Porphyridium cruentum*. *J. Biol. Chem* **252 (18)**: 6421-6423.
- Miyake, N., Kim, M. and Kurata, T. 1999. Stabilization of L- ascorbic acid by superoxide dismutase and catalase. *Biosci. Biotechnol. Biochem.* **63 (1)**: 54-57.

- Nanni, E.J., Stallings, M.D. and Sawyer, D.T. 1980. Does superoxide ion oxidize catechol,  $\alpha$ -tocopherol and ascorbic acid by direct electron transfer. *J. Am. Chem. Soc.* **102**: 4481-4485.
- Nishikimi, M. 1975. Generation of superoxide anion in the reaction of tetrahydropterins with molecular oxygen. *Arch. Biochem. Biophys.* **166**: 273-279.
- Nishikimi, M., Yamada, H. and Yagi, K. 1980. Oxidation by superoxide of tocopherols dispersed in aqueous media with deoxycholate. *Biochim. Biophys. Acta.* **627**: 101-108.
- Ochoa, J.L., Ramirez-Orozco, M., Hernandez-Saavedra, N.Y., Hernandez-Saavedra, D. and Sanchez-Paz, A. 1995. Halotolerant yeast *Debarymyces hansenii* as an alternative source of Cu/Zn superoxide dismutase (SOD). *J. Marine Biotech.* **3**: 224-227.
- Offer, T., Mohsen, M. and Samuni, A. 1998. An SOD-mimicry mechanism underlies The role of nitroxides in protecting papain from oxidative Inactivation. *Free Radic. Biol. & Med.* **25 (7)**: 832-838.
- Ognibene, A., Ciuti, R., Tozzi, P. and Messeri, G. 1999. Maternal serum superoxide dismutase (SOD): A possible marker for screening down syndrome affected pregnancies. *Prenatal Diagnosis* **19**: 1058-1060.
- Okada, Y. and Okada M. 2000. Effect of a radical scavenger "water soluble protein" from broad bean (*Vicia faba*) on antioxidative enzyme activity in cellular aging. *J. Nutr. Sci. Vitaminol. (Tokyo)* **46 (1)**: 1-6.
- Osatomi, K., Masuda, Y., Hara, K. and Ishihara, T. 2001. Purification, N-terminal amino acid sequence, and some properties of Cu, Zn-superoxide dismutase from Japanese flounder (*Paralichthys olivaceus*) hepato-pancreas. *Comp. Biochem. and Physiol. Part B* **128**: 751-760.

- Ozturk, R., Bozkaya, L.A., Atav, E., Saglam, N. and Tarhan, L. 1999. Purification and characterization of superoxide dismutase from *Phanerochaete chrysosporium*. *Enzyme and Microbial Technol.* **25**: 392-399.
- Ozturk-Urek, R. and Tarhan, L. 2001. Purification and characterization of superoxide dismutase from chicken liver. *Comp. Biochem. and Physiol. Part B* **128**: 205-212.
- Padiglia, A., Medda, R., Cruciani, E., Lorrai, A. and Floris, G. 1996. Purification and properties of *Oryza sativa* Cu-Zn superoxide Dismutase. *Prep. Biochem. Biotechnol.* **26** (2): 135-142.
- Pagani, S., Colnaghi, R., Palagi, A. and Negri, A. 1995. Purification and characterization of an iron superoxide dismutase from the nitrogen-fixing *Azotobacter vinelandii*. *FEBS Letters* **357** (1): 79-82.
- Palma, J.M., Pastori, G.M., Bueno, P., Distefano, S. and Del Rio, L. A. 1997. Purification and properties of cytosolic copper, zinc superoxide dismutase from watermelon (*Citrullus vulgaris* Schrad.) cotyledons. *Free Rad. Res.* **26**: 83-91.
- Pan, S.M., Ye, J.S. and Hseu, R.S. 1997. Purification and characterization of manganese superoxide dismutase from *Ganoderma microsporum*. *Biochem. Mol. Biol. Int.* **42** (5): 1035-1043.
- Park, S.S. and Hwang, S.M. 1999. Purification and characterization of iron-containing superoxide dismutase from *Lentinus edodes*. *J. Microbiol. and Biotech.* **9** (6): 854-860.



- Peji, S., Kasapovi, J. and Pajovi, S.B. 1999. Effects of Olive oil on superoxide dismutase activity in the brain of new born and young female rats. *Physiol. Res.* **48**: 297-301.
- Phillips, J.P., Campbell, S.D., Michaud, D., Charbonneau, M. and Hilliker, A.J. 1989. Null mutation of copper/zinc superoxide dismutase in *Drosophila* confers hypersensitivity to paraquat and reduced longevity. *Proc. Natl. Acad. Sci. USA* . **86**: 2761-2765.
- Piacenza, L., Radi, R., Goni, F. and Carmona, C. 1998. CuZn superoxide dismutase activities from *Fasciola hepatica*. *Parasitol.* **117** (Pt6): 555-562.
- Picard, L. 1995. Tropical SOD for treating Hair Loss. U.S. Pat # 5,401,876 Jan. 17, 1995.
- Prasad, K., Chan, WP. and Bharadwaj, B. 1996. Superoxide dismutase and catalase in protection of cardiopulmonary bypass-induced cardiac dysfunction and cellular injury. *Can. J. Cardiol.* **12** (10): 1083-1091.
- Raton, B. 1984. Chemical reagents for protein modification. Raton, B, (ed), CRC Press, FL.
- Ravindranath, S.D. and Fridovich, I. 1975. Isolation and characterization of a manganese-containing superoxide dismutase from yeast. *J. Biol. Chem* . **250** (15): 6107-6112.
- Rhie, G.E., Hwang, C.S., Brady, M.J., Kim, S.T., Kim, Y.R., Huh, W.K., Baek, Y.U., Lee, B.H., Lee, J.S. and Kang, S.O. 1999. Manganese-containing superoxide dismutase and its gene from *Candida albicans*. *Biochim. Biophys. Acta.* **1426** (3): 409-419.

- Robertson, P.Jr. and Fridovich, I. 1982. A reaction of the superoxide Radicals with tetrapyrroles. *Arch. Biochem. Biophys.* **213**: 353-357.
- Saeki, K., Ishikawa, O., Fukuoka, T., Nakagawa, H., Kai, Y., Kakuno, T., Yamashita, J., Kasai, N. and Horio, T. 1986. Barley leaf peroxidase purification and characterization. *J. Biochem.* **99**: 485-494.
- Sakurai, H., Kusumoto, N., Kitayama, K. and Togasaki, R.K. 1993. Isozymes of superoxide dismutase in *Chlamydomonas* and purification of one of the major enzymes containing Fe. *Plant. Cell. Physiol.* **34** (7): 1133-1137.
- Salin, M.L. and Bridges, S.M. 1980. Isolation and characterization of an iron-containing superoxide dismutase from a eukaryote, *Brassica campestris*. *Arch. Biochem. Biophys.* **201** (2): 369-374.
- Salin, M.L. and Bridges, S.M. 1982. Isolation and characterization of an iron-containing superoxide dismutase from water Lily, *Nuphar luteum*. *Plant Physiol.* **69**: 161-165.
- Sanchez-Moreno, M., Entrala, E., Janssen, D. and Osuma, A. 1994. Copper-zinc superoxide dismutase from *Ascaris suum* (nematoda): Purification and characterization. *Biosci. Reports* **14** (2): 83-90.
- Sato, K., Aoki, T. and Nakano, M. 1994. *Dirofilaria immitis*: a large-scale purification method and partial characteristics of a superoxide dismutase from adult worms. *Exp. Parasit.* **78** (2): 210-216.
- Sattayasevana, B. 1990. Study on peroxidase from *Hevea brasiliensis*. Master of science (Biological Science) Prince of Songkla University.
- Sawada, Y., Ohyama, T. and Yamazagi, I. 1972. Preparation and physicochemical properties of green pea superoxide dismutase. *Biochem. et Biophys. Acta.* **268**: 305-312.

- Scioli, J.R. and Zilinskas, B.A. 1988. Cloning and characterization of cDNA encoding the chloroplastic copper/zinc-superoxide dismutase from pea. *Proc. Natl. Acad. Sci. USA.* **85**: 7661-7665.
- Sevilla, F., Lopez-Gorge, J. and Del Rio, L.A. 1982. Characterization of a manganese superoxide dismutase from the higher plant *Pisum sativum*. *Plant Physiol.* **70**: 1321-1326.
- Srinivasan, C., Liba, A., Imlay, J.A., Valentine, J.S. and Gralla, E.B. 2000. Yeast lacking superoxide dismutase (s) show elevated levels of "free iron" as measured by whole cell electron paramagnetic resonance. *J. Biol. Chem* **275 (38)**: 29187- 29192.
- Steinman, H.M. 1978. The amino acid sequence of manganese superoxide dismutase from *Escherichia coli* B. *J. Biol. Chem.* **253 (24)**: 8708-8720.
- Steinman, H.M. 1982. Copper-Zinc superoxide dismutase from *Caulobacter crescentus* CB15. *J. Biol. Chem.* **257 (17)**: 10283-10293.
- Streller, S. and Wingsle, G. 1994. *Pinus sylvestris* L. needles contain extracellular CuZn superoxide dismutase. *Planta* **194 (2)**: 195-201.
- Stryer, L. 1995. Toxic derivatives of O<sub>2</sub> such as superoxide radical are scavenged by protective enzymes : Oxidative phosphorylation. *Biochemistry* (4<sup>th</sup> ed), 1064 pp. W.H. Freeman and Company, New York.
- Sutherland, M.W. and Gebicki, J.M. 1982. A reaction between the superoxide free radical and lipid hydroperoxide in sodium linoleate micelles. *Arch. Biochem. Biophys.* **241**: 1-11.
- Suvachittanont, W. and Kasisadapan, B. 1996. Superoxide dismutase in Ginger (*Zingiber officinale*). *Proc. 2<sup>nd</sup> Symp. Fam. Zingiberaceae* : 161-165.

- Suvachittanont, W. and Wittitsuwannakul, R. 1995. 3-Hydroxy-3-methylglutaryl- coenzyme, a synthase in *Hevea brasiliensis*. *Phytochem.* **40**(3): 757-761.
- Tanaka, K., Takio, S. and Satoh, T. 1995. Inactivation of the cytosolic Cu/Zn-superoxide dismutase induced by copper deficiency in suspension-cultured cells of *Marchantia paleacea* var. *diptera*. *J. Plant Physiol.* **146**: 361-365.
- Tanaka, K., Takio, S., Yamamoto, I. and Satoh, T. 1996 . Purification of the cytosolic CuZn-superoxide dismutase (CuZn- SOD) of *Marchantia paleacea* var. *diptera* and its resemblance to CuZn-SOD from chloroplasts. *Plant Cell Physiol.* **37** (7): 523-529.
- Tesfa-Selase, F. and Hay, R.J. 1995. Superoxide dismutase of *Cryptococcus neoformans* : Purification and characterization. *J. of Med. and Vet. Mycol.* **33** (4): 253-259.
- Van Camp, W., Bowler, C., Villarroel, R., Tsang, E.W.T., Van Montagu, M. and Inze, D. 1990. Characterization of iron superoxide dismutase cDNAs from plants obtained by genetic complementation in *Escherichia coli*. *Proc. Natl. Acad. Sci.* **87**: 9903-9907.
- Verspaget, H.W. 1998. Manganese-superoxide dismutase has prognostic value in colorectal cancer. *Br. J. Cancer* **78**: 1051-1057.
- Vig, E., Gabrielak, T., Leyko, W., Nemosok, J. and Matkovic B. 1989. Purification and characterization of Cu,Zn-superoxide dismutase from common carp liver. *Comp Biochem Physiol. B* **94** (2): 395-397.

- Weisiger, R.A. and Fridovich, I. 1973. Superoxide dismutase organelle specificity. *J. Biol. Chem.* **248** (10): 3582-3592.
- Wilde, L.G. and Y, M. 1998. Effect of fluoride on superoxide dismutase (SOD) activity in germinating mung bean seedlings. *Fluoride* **31** (2): 81-88.
- Wititsuwannakul, R. 1986. Diurnal variation of HMG CoA reductase in latex of *Hevea brasiliensis*. *Experientia* **42**: 45-46.
- Yakes, F.M. and Van Houten, B. 1997. Mitochondrial DNA damages is more extensive and persists longer than nuclear DNA damage in human cells following oxidative stress. *Proc. Natl. Acad. Sci. USA.* **94**: 514-519.
- Yamahara, T., Shiono, T., Suzuki, T., Tanaka, K., Takio, S., Sato, K., Yamazaki, S. and Satoh, T. 1999. Isolation of a germin-like protein with manganese superoxide dismutase activity from cells of a moss, *Barbula unguiculata*. *J. Biol. Chem.* **274** (47): 33274-33278.
- Yamano, S., Sako, Y., Nomura, N. and Maruyama, T. 1999. A cambiasitic SOD in a strictly aerobic hyperthermophilic archaeon, *Aeropyrum Pernix*. *J. Biochem.* **126** (1): 218-225.
- Yost, F.J.Jr. and Fridovich I. 1973. An Iron-containing superoxide dismutase from *Escherichia coli*. *J. Biol. Chem.* **248** (14): 4905-4908.
- Youn, H.D., Kim, E.J., Roe, J.H., Hah, Y.C. and Kang, S.O. 1996a. A novel nickel-containing superoxide dismutase from *Streptomyces spp.* *Biochem J.* **318** (Pt3): 889-896.
- Youn, H.D., Youn, H., Lee, J.W., Yim, Y.I., Lee, J.K., Hah, Y.C. and Kang, S.O. 1996b. Unique isozymes of superoxide dismutase in *Streptomyces griseus*. *Arch. Biochem. Biophys.* **334** (2): 341-348.

Yu, Q. and Rengel, Z. 1999. Waterlogging Influences plant growth and activities of superoxide dismutases in narrow-leafed lupin and transgenic tobacco plants. *J. Plant Physiol.* **155**: 431-438.

Zhang, J. and Kirkham, M.B. 1994. Drought-stress-induced changes in activities of superoxide dismutase, catalase, and peroxidase in wheat species. *Plant Cell Physiol.* **35**: 785-791.

OncoLink Cancer News <http://www.oncolink.upenn.edu>

Reuters Health Information <http://www.wcn.org>