BIBLIOGRAPHY

- Abdel-Wahab, M. H and Abdel-Allah, A. R. (2000). Possible protective effect of melatonin and/or desferroxamine against streptozotocin-induced hyperglycemia in mice. Pharmacol. Res., 41: 533-537
- Abuja P. M., Liebmann P., Hayn M., Schauenstain K., Esterbauer H. (1997). Antioxidant role of melatonin in lipid peroxidation of human LDL. FEBS Lett., 413. 289-293.
- Acuno-Castroviejo D., Reiter R.J., Menendez-Pelaez A., Pablos M.I., Burgos A. (1994). Characterization of high-affinity melatonin binding sites in purified cell nuclei of rat liver. J. Pineal Res., 16: 100-112.
- Adi, N. C (2004). Effect of melatonin receptor (MT2) antagonist in rat neonates on adult carbohydrate and lipid metabolism, pancreatic function and alloxan induced diabetes. Ph.D. Thesis submitted to the M. S. University of Baroda.
- Allain C. C., Poon L. S., Chan C. S., Richmond W. and Fu P. C. (1974). Enzymatic determination of total serum cholesterol. Clin. Chem., 20: 470-475.

- Allain D., Rougeot J. (1980) Induction of autumn moult in mink (Mustela vison Peale and Beauvis) with melatonin. Reprod. Nutr. Dev., 20· 197-201.
- Anderson A. K., Sandler S. (2001). Melatonin protects against streptozotocin, but not interleukın-1B-ınduced damage of rodent pancreatic B-cells. J. Pineal Res., 30: 157-165.
- Anwar, M M., and Abdel-Raheim M.A. Meki. (2003). Oxidative stress in streptozotocin induced dıabetic rats: effects of garlic oil and melatonin. Comp. Biochem. Physiol.-PA: Mol Integr. Physiol., 135(4): 539-547.
- Aoyama, H., Mori, N., Mori, W. (1988). Effects of melatonin on genetic hypercholesterolemia in rats. Atherosclerosis., 69: 269.
- Arendt, J. (1995). Melatonin and the mammalian pineal gland. Chapman and Hall, Cambridge, p. 72.
- Arulmozhi, D. K., Veeranjaneyulu A, Bodhankar S. L. (2004). Neonatal streptozotocin-induced rat model of type 2 diabetes mellitus: A glance Ind. J. Pharmacol., 36(4). 217-221.
- Bailey C.J., Atkins T.W., Matty A.J.(1974). Melatonin inhibition of insulin secretion in the rat and mouse. Horm Res., 5: 21-28.
- Balasubramaniam, S, Szanto, A and Roach, P.D. (1994). Circadian rhythm in hepatic low-density-lipoprotein (LDL)-receptor expression and plasma LDL levels. Biochemical Journal., 298-39-43.
- Banerjee, S, Paul Saenger, Meizhu Hu, Wei Chen and Nir Barzilai. (1997) Fat accretion and the regulation of insulın

mediated glycogen synthesis after puberty in rats Am J Physiol Regul Integr Comp Physiol., 273: R1534-R1539.

- Barlow-Walden L R, Reiter R J, Abe M, Pablos M, Menendez-Pelaez A, Chen L D, Poeggeler B. (1995). Melatonin stimulates brain glutathione peroxidase activity. Neurochem Int., 26: 447-502.
- Bartness TJ, Demas GE, Song CK. (2002). Seasonal changes in adiposity: the roles of the photoperiod, melatonin and other hormones, and sympathetic nervous system. Exp. Biol. Med., 227: 363-376.
- Bartness, T. J. (1995). Short day-induced depletion of lipid stores is fat pad and gender specific in Siberian hamsters. Physiol. Behav., 58: 539-550
- Bartness, T. J. and Wade, G. N. (1985). Photoperiodic control of seasonal body weight cycles in hamsters. Neurosci. Biobehav. Rev., 9· 599-612.
- Bartness, T.J., B. Powers, M.H. Hastings, E.L. Bittman, B.D. Goldman (1993). The timed infusion paradigm for melatonin delivery: What has it taught as about the melatonin signal, its reception, and the photoperiodic control of seasonal responses? J. Pineal Res., 15: 161-190.
- Becham C., Padwich D.J., al-Tayib Y., Smith J.A. (1989). Diurnal variation and melatonin induction of hepatic molybdenum hydroxylase activity in the Guniea Pig. Biochem. Pharmacol., 38: 1459-1464.

- Becker Andre, M, Wiesenberg, I, Schaeren-Wiemers, N, Adre, E, Missibach, M, Saurat, JH, Carlber, C. (1994). Pineal gland hormone melatonin binds and activates an orphan of the nuclear receptor superfamily. J. Biol. Chem., 269· 28531-28534.
- Bizot-Espiard J.G., Double A., Cousin B., Lesieur D., Guardiola-Lemaitre B., Delagrange P., Ktorza A., Penicaud L. (1998). Lack of melatonin effects on insulin action in normal rats. Horm. Metab. Res., 30: 711-716.
- Blask, D. E., S. T. Wilson, F. Zalatan (1997). Physiological melatonin inhibition of human breast cancer cell growth *in vitro*: Evidence for a glutathione mediated pathway. Cancer Res., 57: 1909-1914.
- Blondel O, Bailbe D, Portha B. (1990). Insulin resistance in rats with non-insulin-dependent diabetes induced by neonatal (5 days) streptozotocin: evidence for reversal following phlorizin treatment. Metabolism., 39(8): 787-793.
- Bonner-Weir, S. (2000). Islet growth and development in the adult. Journal of Molecular Endocrinology, 24: 297-302.
- Bonner-Weir, S. (2000). Perspective: Postnatal pancreatic B cell growth. Endocrinology, 141(6): 1926-1929.
- Boquist, L., Nelson, L., Lorentzon, R. (1983). Uptake of labeled alloxan in mouse organs and mitochondria *in vivo* and *in vitro*. Endocrinology., 113: 943-948.
- Bouwens L, Kloppel G (1996). Islet cell neogenesis in the pancreas. Virchows Arch., 427: 553-560.

- Bouwens L, Pipeleers D G (1998). Extra-insular beta cells associated with diabetes are frequent in adult human pancreas. Diabetologia., 41: 629-633.
- Bouwens L. (1998). Transdifferentiation versus stem cell hypothesis for the regeneration of islet beta-cell in the pancreas. Micros. Res. Tech., 43: 332-336.
- Boylan, J. M., Brautigan, D. L., Madden, J , Raven, T., Ellis, L., Gruppuso, P. A. (1992). Differential regulation of multiple hepatic protein tyrosine phosphatases in alloxan diabetic rats. J. Clin. Invest., 90: 174-179.
- Bromme H. J., Morke W., Peschke E, Peschke D. (2000). Scavenging effect of melatonin on hydroxyl radicals generated by alloxan. J. Pineal Res., 29: 201-208.
- Bromme, H. J., H. Ebelt, D. Peschke, E. Peschke (1999). Alloxan acts as a prooxidant under reducing conditions: Influence of melatonin. Cell. Mol. Life Sci., 55: 487-493.
- Brown, G. M. (1992). Day-night rhythm disturbance, pineal function and human disease. Horm. Res , 37(3): 105-111.
- Brown, G. M. (1995). Melatonin in psychiatric and sleep disorders: Therapeutic implications. CNS Drug., 3: 209-226.
- Bucolo G and David H. (1973). Quantitative determination of serum triglycerides by the use of enzymes. J. Clin. Pathol., 22(2): 246
- Cagnacci, A., Aragino, S., Renzi, A.(2001). Influence of melatonin administration on glucose tolerance and insulin

sensitivity of postmenopausal women Clin. Endocrinol (Oxf)., 54. 339-346.

- Cagnoli, C M, Atabay C, Kharlamova E, Manev H. (1995). Melatonin protects from singlet oxygen-induced apoptosis. J. Pineal Res., 18. 222-226.
- Cahill, G. F. Jr., Ashmore, J., Zottu, S. and Hastings, A. B. (1957). Studies on carbohydrate metabolism in rat liver slices. IX. Ionic and hormonal effects on phosphorylase and glycogen. J. Biol. Chem., 224: 237-250.
- Chapman C. (1997). The effects of diet and gastrointestinal hormones on lipoprotein lipase activity and gene expression. PhD. Thesis, University of Surrey, Guldford, UK.
- Chauhan, U.P.S. and Pravendra Nath (1978). Glucose metabolism in heart, liver and diaphragm in alloxan diabetic rats. Ind. J. Expt. Biol., 16: 75-78
- Chen, C., Hosokawa H, Bumbalo L. M and Leahy J L (1994). Regulatory effects of glucose on the catalytic activity and cellular content of glucokinase in the pancreatic B cell. J. Clin. Invest., 94: 1616-1620.
- Chowdhury, A.R. and Arora, U. (1984). Role of thyroid in testicular development of immature rat. Arch. Androl., 12: 49-51.
- Cori, C. F., Cori, C. T. and Green, A. (1943). Crystalline muscle phosphorylase III. Kinetics. J. Biol Chem., 151: 39-55.

- Crawford, N. (1958). An improved method for determination of free and total cholesterol using ferric chloride reaction. Clin. Chem Acta., 3: 357-367.
- Crespo, E., M Macias, D. Pozo, G. Escames, M. Martin, F. Vives, J. M. Guerrero, D. Acuna-Castroviejo. (1999) Melatonin inhibits expression of the inducible NO synthetase II in liver and lung and prevents endotoxemia in lipopolysaccharide-induced multiple organ dysfunction syndrome in rats. FASEB J., 13: 1537-1546.
- Csaba, G., Barath (1971) Are langerhans islets influenced by pineal body? Experientia., 27: 962.
- Cuzzocrea, S., A. P. Caputi. (1999). Protective effect of melatonin on zymosan-induced cellular damage. Biol. Signals Recept., 8: 136-142
- Cuzzocrea, S., D. X. Tan, G. Costantino, E. Mazzon, A. P. Caputi, R. J. Reiter. (1999). The protective role of endogenous melatonin in carrageenan-induced pleurisy in the rat. FASEB J., 13: 1930-1938.
- Damasceno, D C., G. E. Volpato, N. Paranhos-Calderon and M. V. Cunha-Rudge. (2002). Oxidative stress and diabetes in pregnant rats. Anim Reprod. Sci., 15(72): 235-244.
- Damian, E. (1989) The antisteroid, antigonadotropic and metabolism-regulation activity of the pineal gland. Rev. Roum. Med. Endocrinol., 27(2): 57-64.

- Daniel, O. B. and Portha, B.(1989). Relation of insulin deficiency to impaired insulin action in NIDDM adult rat given streptozotocin as neonates. Diabetes., 38: 610-617.
- Debeljuk, L. (1969). Effect of melatonin on the gonadotropic of the male rat under constant illumination. Endocrinology., 84: 937.
- Delahunty G., Bauer G., Prack M., de Vlaming V.(1978). Effects of pinealectomy and melatonin treatment on liver and plasma metabolites in the Gold Fish, Carassius auratus. Gen. Comp. Endocrinol , 35: 99-109.
- deVlaming V. L., Sage M., Charlton C. B., Tiegs B. (1974). The effects of melatonin on lipid deposition in cyprinodontid fishes and on pituitary prolactin activity in Fundulus similes. J. Comp. Physiol., 94: 309-319.
- Dhar M., Dayal S S , Ramesh-Babu C.S., Arora S.R.(1983). Effect of melatonin on glucose tolerance and blood glucose circadian rhythms in rabbits. Ind. J. Physiol. Pharmacol., 27: 109-117.
- Diaz B., Blazquez E.(1986). Effect of pinealectomy on plasma glucose, insulin and glucagon levels in the rat. Horm. Metab. Res., 24: 225-229.
- Docherty, K. and Clark, A. R. (1994). Nutrient regulation of insulin gene expression. FASEB J., 8: 20-27.
- Dubocovich, M. L., Kenneth Yun, Walid M. Al-Ghoul, Susan Benloucif and Monica I. Masana (1998). Selective MT_2

melatonin receptor antagonists block melatonin-mediated phase advances of circadian rhythms. The FASEB Journal., 12: 1211-1220.

- Dunn, J. S., Sheehan, H. L. and McLethie, N. G. B. (1943). Necrosis of islets of langerhans produced experimentally. Lancet., 1: 484-487.
- Ebadi M., Govitrapong P., Phansuwan-Pujito P., Nelson F., Reiter R.J. (1998). Pineal opioid receptors and analgesic action of melatonin. J. Pineal Res., 24: 193-200.
- Ebelt H., Peschke D., Bromme H. J., Morke W., Blume R., Peschke E. (2000). Influence of melatonin on free radical-induced changes in rat pancreatic beta-cells *in vitro*. J. Pineal Res., 28: 65-72.
- Esquifino A., Agrasal C., Velazquez E , Villanua M A., Cardinali D. P. (1997). Effect of melatonin on serum cholesterol and phospholipid levels, and on prolactin, thyroid-stimulating hormone and thyroid hormone levels, in hyperprolectinemic rats. Life Sci., 61: 1051-1058.
- Fabis M , Ewa Pruszynska and Pawel Mackowiak (2002). *In vivo and In Situ* action of melatonin on insulin secretion and some metabolic implications in the rat. Pancreas., 25(2): 166-169.
- Fernandes, A., L. C. King, Y. Guz, R. Stein, C.V.E. Wright and G. Teitelman (1997). Differentiation of new insulin-producing cells is induced by injury in adult pancreatic islets. Endocrinology, 138(4). 1750-1762.

- Finegood D T, Scaglia L and Bonner-Weir S (1995) (Perspective). Dynamics of B-cell mass in the growing rat pancreas: estimation with a simple mathematical model. Diabetes., 44: 249-256.
- Fiske, C. H and SubbaRow, P. (1925). The colorimetric determination of phosphorous. J. Biol. Chem , 66: 375-400.
- Folch, J., Lees, M. and Sloantanley, G. H. (1957). A simple method for the isolation and purification of total lipids from animal tissues J Biol. Chem., 226: 497-509.
- Frankel B.J. and Trandberg M.J.(1991). Insulin release from isolated mouse islets *in vitro*: No effects on physiological levels of melatonin or arginine vasotocin. J. Pineal Res., 11: 145-148.
- Frehn J.L., Urry R.L., Ellis L.C.(1974). Effect of melatonin and short photoperiod on δ 4-reductase activity in liver and hypothalamus of the Hamster and the Rat. J. Endocrinol., 60: 507-515.
- Frerichs, H. and W. Creutzfeldt. (1971). Der experimentelle chemische Diabetes. In: Handbuch der Experimentellen Pharmakologie, H. Dorzbach, ed, Vol. 32/1 Insulin 1. Springer, Berlin, pp: 159-202.
- Gilad E, Cuzzocrea S, Zingarelli B, Salzman A L, Szabo C. (1997). Melatonin as a scavenger of peroxynitrite. Life Sci., 60: PL169-PL174.
- Giusti, P., M. Lipartiti, M. Gusella, M. Floreani, H. Manev. (1997). *In vitro* and *in vivo* protective effects of melatonin against

glutamate oxidative stress and neurotoxicity. Ann. NY Acad. Sci., 825: 79-84.

- Goodman, M.N., Dluz, S.M., McElaney, E. Bleur and N B. Ruderman. (1983). Glucose uptake and insulin sensitivity in rat muscle: changes during 3-96 weeks of age. Am J. Physiol. Endocrinol. Metab., 244: E93-E100.
- Gorray, K.C., Quay, W.B. and Ewart, R.B.L.(1979). Effects of pinealectomy and pineal incubation medium and sonicates on insulin release by isolated pancreatic islets *in vitro*. Horm. Metab. Res., 11: 432-436.
- Grankvist, K. (1981). Alloxan-induced luminal luminescence as a tool for investigating mechanisms of radical-mediated diabetogenicity. Biochem. J., 200: 685-690.
- Grankvist, K., Marklund, S., Sehlin, J., Taljedal, I. B. (1979). Superoxide dismutase, catalase and scavengers of hydroxyl radical protect against the toxic action of alloxan on pancreatic islet cells *in vitro.* Biochem. J., 182: 17-25.
- Gruppuso, P. A., Boylan, J. M., Posner, B. I., Faure, R, Brautigan, D. L. (1990). Hepatic protein phosphotyrosine phosphatase. Dephosphorylation of insulin receptor and epidermal growth factor receptors in normal and alloxan diabetic rats. J. Clin. Invest., 85: 1754-1760.
- Halban, P. A. (1990) Proinsulin trafficking and processing in the pancreatic B-cell. Trends Endocrinol. Metab., 1: 261-265.

- Hampton, S. M., Morgan, L. M., Lawrence, N., Anastasiadou, T., Norris, F., Deacon, S., Riberio, D. and Arendt, J. (1996). Postprandial hormone and metabolic responses in simulated shift work. J. Endocrinol., 151: 259-267.
- Harper, A. E. (1963). Glucose-6-phosphatase. In: Methods of enzymatic analysis. (Eds) H. U. Bergmeyer Acad. Press, NY and London, pp: 788-792
- Heikkila, R. E , Winston, B., Cohen, G., Barden, H. (1976). Alloxan induced diabetes, evidence for hydroxyl radicals as a cytotoxic intermediate. Biochem Pharmacol., 25· 1085-1092.
- Hellerstrom C, Andersson A, Swenne I, Welsh M, Welsh N, Sjoholm A. (1988) Replication of B-cells in the normal and diabetic pancreas In: Efendic S, Grill V, eds Nobel Symposium-Pathogenesis of Non-Insulin Diabetes Mellitus New York, NY: Raven Press: 79-91.
- Hellerstrom C, Swenne I. (1985). Growth pattern of pancreatic islets in animals. In: Volk BW, Arquilla ER, eds. The Diabetic Pancreas. New York NY. Plenum Press· 53-79.
- Hill S.M., Blask D.E. (1988). Effects of the pineal hormone melatonin on the proliferation and morphological characteristics of human breast cancer cells (MCF-7) in culture. Cancer Res., 48: 6121-6126
- Himms-Hagen, J. (1984). Nonshivering thermogenesis. Brain Res. Bull., 12: 151-160.

- Howell, S L and Bird, G. S J. (1989). Biosynthesis and secretion of insulin gene expression Br Med. Bull., 45: 19-36.
- Hoyos, M., Guerrero, J. M., Perez-Cano, R., *et al.* (2000). Serum cholesterol and lipid peroxidation are decreased by melatonin in diet-induced hypercholesterolemic rats. J. Pineal Res., 28: 150-155
- Hron, W. P. and Menahan, L. A. (1981). A sensitive method for the determination of free fatty acids in plasma. J. Lipid. Res., 22: 377-381
- Humlova M., Illnerova H. (1990). Melatonin entrains the circadian rhythms in the rat pineal N-acetyltransferase activity. Neuroendocrinology., 52: 196-199.
- Ianas O, Olivescu R, Badescu I. (1991). Melatonin involvement in oxidative process. Rom J Endocrinol., 29: 117-123.
- Iizuka Y. (1996). Effect of melatonin on serum glucose and insulin levels in rats. Medicine and Biology., 133: 65-67.
- Iwase M, Nunoi K, Himeno H, Yoshinari M, Kikuchi M, Maki Y, Fujishima M. (1994). Susceptibility to neonatal streptozotocin-induced diabetes in spontaneously hypertensive rats. Pancreas., 9(3): 344-348.
- Iwase M, Nunoi K, Kikuchi M, Maki Y, Kodama T, Sadoshima S, Fujishima M. (1989). Morphometrical and biochemical differences of endocrine pancreata between spontaneously hypertensive and normotensive rats with or without neonatal streptozotocin-induced diabetes. Lab. Invest., 60(1): 102-105.

- Iwase M, Nunoi K, Wakisaka M, Kikuchi M, Maki Y, Sadoshima S, Fujishima M. (1991) Spontaneous recovery from non-insulin-dependent diabetes mellitus induced by neonatal streptozotocin treatment in spontaneously hypertensive rats. Metabolism., 40(1): 10-40.
- Iwase M. (1991). A new animal model of non-insulin-dependent diabetes mellitus with hypertension: neonatal streptozotocin treatment in spontaneously hypertensive rats. Fukuoka Igaku Zasshi., 82(7): 415-427
- John T.M., Viswanathan M , George J.C., Scanes C.G. (1990). Influence of chronic melatonin implantation on circulating levels of catecholamines, growth hormone, thyroid hormones, glucose and free fatty acids in the pigeon. Gen. Comp. Endocrinol., 79: 226-232
- Johnson A. D. and Turner P. C. (1971). Epididymal carbohydrate metabolism I. Glucose-1-^{14}C and glucose-6-^{14}C metabolism by mouse, rat and rabbit tissues Comp. Biochem. Physiol., 39(A). 599-604.
- Jorns, A., M. Tiedge, S. Lenzen, R. Munday. (1999). Effects of superoxide dismutase, catalase, chelating agents, and free radical scavengers on the toxicity of alloxan to isolated pancreatic islets *in vitro*. Free Radic. Biol. Med , 26: 1300-1304.
- Junod A, Lambert A. E, Stanffacher W, Reynold A E. (1969). Diabetogenic action of streptozotocin: relationship of the dose to metabolic response. J Clin. Invest., 48. 2129-2139.

- Katsumata, K., Katsumata, k. Jr., Katsumata, Y. (1992). Protective effect of diltiazem hydrochloride on the occurrence of alloxan or streptozotocin induced diabetes in rats. Horm. Metab. Res., 24· 508-510.
- Katsumata, K., Katsumata, Y , Ozawa, T., Katsumata, K. Jr. (1993). Potentiating effects of combined usage of three sulfonylurea drugs on the occurrence of alloxan diabetes in rats. Horm. Metab. Res., 25: 125-126.
- Keen H, Ng Tang Fui S. (1982). The identification and classification of diabetes mellitus. Clin Endocrinol Metab., 11: 279-305.
- Kinson, G.A. and Peat, F. (1971). The influence of illumination, melatonin and pinealectomy on the testicular function in the rat. Life Sci., 10: 259.
- Kınson, G.A and Robinson, S. (1970). Gonadal functions of immature male rats subjected to light restriction, melatonin administration and the removal of the pineal gland. J. Endocrinol., 47: 391-395.
- Kloppel G, Lohr M, Hablich K, Oberholzer M, Heitz P U. (1985). Islet pathology and pathogenesis of type I and type II diabetes mellitus revisited Sur. Synth Path. Res , 4: 110-125.
- Kodama T., Iwase H , Nunoi K., Maki Y., Yoshinari M., Fujishima M. (1993). A new diabetes model induced by neonatal alloxan treatment in rats. Diabetes Res. Clin. Pract., 20(3): 183-189.

- Koyama, K., Guoxun Chen, young Lee, and Roger H. Unger. (1997). Tissue triglycerides, insulin resistance and insulin production: implications for hyperinsulinemia of obesity. Am J. Physiol. Endocrinol. Metab., 273(4): E708-E713.
- Kraft, L. A. and A. D. Johnson (1972). Epididymal carbohydrate metabolism-II substrates and pathway utilization of caput and cauda epididymal tissue from the rabbit, rat and mouse. Comp. Bioichem. Physiol., 42B: 451-461.
- La Fleur .S.E., Kalsbeek A., Wortel J., Vliet Van Der J., Buijs R.M.(2001). Role for the pineal and melatonin in glucose homeostasis: Pinealectomy increases night-time glucose concentrations. J. Neuroendocrinol., 13: 1025-1032.
- Lagneux C., Joyeux M., Demenge P.(2000). Protective effects of melatonin against ischemia-reperfusion injury in the isolated rat heart. Life Sci., 66: 503-509.
- Le Doux, S. P., Hall, C. R., Forbes, P. M , Patton, N. J., Wilson, G. L. (1988) Mechanisms of nicotinamide and thymidine protection from alloxan and streptozotocin toxicity. Diabetes., 37: 1015-1019.
- Le Gouic S., Delagrange, P., Atgie C., *et al.* (1996). Effects of both a melatonin agonist and antagonist on seasonal changes in body mass and energy intake in the garden dormouse. Int. J. Obes. Relat. Metab. Disord., 20: 661-667.
- Leighton, B, J.M. Kowaalchuk, R.A. Challis and E.A. Newsholme. (1988), Circadian rhythm in sentivity of glucose

metabolism to insulin in rat soleus muscle. Am. J. Physiol. Endocrinol. Metab., 225:E41-E45.

- Leloir, L. F. and Goldemberg, S. H. (1962) Glycogen synthetase from rat liver In: Methods of enzymology. (Eds) S. P. Colowick and N. O. Kaplanvol, V. Acad. Press, pp: 145-157.
- Lenzen, S. and Munday, R. (1991). Thiol-group reactivity, hydrophilicity and stability of alloxan, its reduction products and its N-methyl derivatives and a comparison with ninhydrin. Biochem. Pharmacol., 42. 1385-1391.
- Lenzen, S. and Panten, U. (1988). Alloxan: history and mechanism of action. Diabetologia., 31: 337-342.
- Lima, F.B., Matsushita, D.H., Hell, N.S.(1994). The regulation of insulin action in isolated adipocytes: Role of the periodicity of food intake, time of day and melatonin. Braz. J. Med. Biol. Res., 27: 995-1000.
- Lipsett. M and Diane T. Finegood (2002). B-cell neogenesis during prolonged hyperglycemia in rats. Diabetes, 51· 1834-1841.
- Lowry, D. H., Rosenberg, N J., Farr, A. and Randell, J. (1951). Protein measurement with the Folin phenol reagent. J. Biol. Chem., 193: 265-275.
- Maestroni G.J.M. (1993). The immunoendocrine role of melatonin. J. Pineal Res , 14: 1-10.
- Mahata S K., Mandal A., Ghosh A. (1988). Influence of age and splanchnic nerve on the action of melatonin in the

adrenomedullary catecholamine content and blood glucose level in the avian group. J. Comp. Physiol., 158: 601-607.

- Maitra, S.K., M. Dey, R. Dey, S. Bhattacharya and A. Sengupta.(2000) Influence of photoperiods on glycemic and adrenal catecholaminergic responses to melatonin administrations in adult male roseringed parakeets, Psittacula krameri Neumann. Ind. J. Expt. Biol., 38: 1111-1116.
- Malaisse, W. J. (1982). Alloxan toxicity to pancreatic B-cell. Biochem. Pharmacol., 22: 3527-3534.
- Malaisse, W. J., F Malaisse-Lagae, A. Sener, D. G. Pipeleers. (1982). Determinants of the selective toxicity of alloxan to the pancreatic B-cell. Proc. Natl Acad. Sci. USA., 79: 927-930.
- Markova, M., E. Adamekova, P. Kubatka, B. Bojkova, E. Ahlersova, I. Ahlers (2003). Effect of prolonged melatonin administration on metabolic parameters and organ weights in young male and female Sprague-Dawley rats. Acta. Vet. Brno., 72: 163-172.
- Marshall K A, Reiter R J, Poeggeler B, Aruoma O I, Halliwell B. (1996). Evaluation of the anti-oxidant activity of melatonin *in vitro*. Free Radical Biol. Med., 21: 307-315.
- Martin M.T., Azpiroz F , Malagelada J.R (1998). Melatonin and the gastrointestinal tract. Therapie, 53: 453-458.
- Mazepa, R.C., Cuevas, M.J., Collado, P.S.(2000). Melatonin increases muscle and liver glycogen content in nonexercised and exercised rats. Life Sci., 66: 153-160.

- McElroy, J. F. and Wade, G. N. (1986). Short photoperiod stimulates brown adipose tissue growth and thermogenesis but not norepinephrine turnover in Syrian hamsters. Physiol. Behav., 37: 307-311.
- McKeown B A , John T. A., George, J. C (1975). Diurnal variation of effects of melatonin on plasma growth hormone and glucose in the pigeon. Endocrinol. Exp., 4. 263
- Merzouk, H., S. Madani, D. Chabane, J. Prost, M. Bouchenak and J. Billeville. (2000). Time course of changes in serum glucose, insulin, lipids and tissue lipase activities in macrosomic offsprings of rats with streptozotocin-induced diabetes. Clin Sci., 98: 21-30.
- Mihail, N. and Giurgea, R. (1979). Aspects of carbohydrate metabolism after pinealectomy in normal and pinealectomized pigeon (Columba livia). Rev. Roum. Med. Endocrinol., 17: 255-258.
- Milcu, I., Nanu, L. and Marcean, R (1957). Del existence dune hormone hypoglycemiante epidhysaire synergique de l' insulin. Ann. Endocrinol., 18: 612-620.
- Milcu, I., Nanu, L., Marcean, R. and Sitaru, S.(1963). L. action de l' extrait pineal et de la pinealectomie sur le glycogene hepatique et. musculaire après infusion prolongee de glucose. Etudes et. Rech. d' endocrinol. Acas. Repub. Pop. Rom., 14: 651-655.

- Milcu, S.M , I. Milcu.(1958). Ube rein hypoglykamisch whirkendes Hormon in der Zirbeldruse. Medizinische., 17: 711-715.
- Milcu, S.M., Nanu, L. and Milcu, I.(1971). The effect of pinealectomy on plasma insulin in rats. In "The pineal gland". (G.E.W. Wolstenholme and F Night Eds.) Churchill-Livingstone, London., 345-360.
- Miller, R. E. (1981). Pancreatic neuroendocrinology: peripheral neural mechanisms in the regulation of the islets of Langerhans. Endocrine. Rev , 2: 471-494.
- Mondon, C.E and Burton, S.D.(1971). Factors modifying carbohydrate metabolism and effect of insulin in perfused rat liver. Am. J. Physiol., 220 724-734.
- Montilla P. L , J. F. Vargas, I. F. Tunez, M. C. Munoz de Aqueda, M. E. Valdelvira and E. S. Cabrera. (1998). Oxidative stress in diabetic rats induced by streptozotocin: protective effects of melatonin. J. Pineal Res., 25: 94-100.
- Morgan, P. J., P. Barrett, D. Hazlerigg, G Milligan, W, Lawson, W, Maclean, G. Davidson. (1995). Melatonin receptors couple through a cholera toxin sensitive mechanism to inhibit cAMP in the ovine pituitary. J. Neuroendocrinol., 7: 361-369.
- Mori, N., Aoyama, H., Murase, T., Mori, W. (1989). Anti-hypercholesterolemic effect of melatonin in rats. Acta Pathol. Jpn., 39: 613-618.

- Mori, W , H, Aoyama, and N. Mori. (1984). Melatonin protects rat from injurious effects of glucocorticoid, dexamethasone. Jpn. J. Exp. Med., 54. 225-261.
- Muller-Wieland, D. Behnke B., Koopman, K. and Krone, W. (1994). Melatonin inhibits LPL receptor activity and cholesterol synthesis in freshly isolated human mononuclear leukocytes. Biochemistry and Biophysics Research Communications., 203: 416-421.
- Munday, R. (1988). Dialuric acid autoxidation. Effects of transition metals on the reaction rate and on the generation of "active oxygen" species. Biochem. Pharmacol., 37: 409-413.
- Muralidhar, S S., Dayal. C. S., Ramesh babu and Arora S. R. (1983). Ef fect of melatonin on glucose tolerance and blood glucose circadian rhythm in rabbits. Ind. J. Physiol. Pharmocol., 27(2): 209-217.
- Mustonen, A-M., P. Nieminen and H. Hyvarinen (2002). Effects of continuous light and melatonin treatment on energy metabolism of the rat. J. Endocrinol. Invest., 25.716-723.
- Nishida S, Segawa T, Murai I, Nagakawa S. (2002) Long term melatonin administration reduces hyperinsulinemia and improves the altered fatty-acid compositions in type 2 diabetic rats via the restoration of δ^5-desaturase activity. J. Pineal Res., 32: 26-33.
- Noda Y, Mori A, Liburty R, Packer L. (1999). Melatonin and its precursors scavenge nitric oxide. J. Pineal Res., 27: 159-163.

- Notario, A. (1956). Comporta mento istologico di alcuni organi endocrine dell cavia adulta dopo prolungata somministrazione di un estratto episario. Arch. De, Vecchi Anat. Patol Med. Clin. (Firenze)., 24: 305-318.
- O'Rahilly, S., Krook, A., Morgan, R., Rees, A., Flier, J. S., Moller, D. E. (1992). Insulin receptor and insulin-responsive glucose transporter (GLUT-4) mutations and polymorphisms in a Welsh type 2 (non-insulin-dependent) diabetic population. Diabetologia., 35: 486-489.
- Okamato H. (1981). Regulation of pro insulin synthesis in pancreatic islet and a new aspect to insulin dependent diabetes. Mol Cell Biochem., 37: 43-61.
- Osei, P , Robbins, K. R., Shirley, H. V. (1989). Effects of exogenous melatonin on growth and energy metabolism of chickens. Nutr. Res., 9: 69-81.
- Pagliassotti, M., J. Ellis, C. Gayles., Deborah, A. Podlin, Yuren Wei, and Catherine I. Morin. (2000) Developmental stage modiies diet-induced peripheral insulin resistance in rats. Am. J. Physiol. Regul. Integr. Comp. Physiol , 278(1): R66-R73.
- Pang S.F., Dubocovich M.L., Brown G.M.(1993). Melatonin receptors in peripheral tissues· A new area of melatonin research. Biol. Signals, 2: 177-180.
- Pang, S. F., C.S. Pang, A.M.S. Poon, S Y.W. Shiu, Y. Song, P.P.N. Lee, Y. Zhao, Z.M. Liu (1996). Recent development of pineal melatonin and its receptors in humans. In: Melatonin: A

universal photoperiodic signal with diverse actions, P.L. Tang, S. F. Pang, R.J. Reiter, eds, Front. Horm. Res. Karger., 21: 133-146.

- Pang, S F., P.P.N. Lee, Y. S Chan, E A Ayre (1992). Melatonin secretion and its rhythms in biological fluids. In: Melatonin: Biosynthesis, Physiological Effects, and Clinical Applications, H H. Yu, R.J. Reiter, eds. CRC Press, Boca Raton., 129-153.
- Paris M., Catherine Bernard-Kargar, Marie-France Berthault, Luc Bouwens and Alain Ktorza (2003). Specific and combined effects of insulin and glucose on functional pancreatic B-cell mass *in vivo* in adult rats. Endocrinology, 144(6): 2717-2727.
- Patel, C.S., Jani, J.R., Singh, D. and Ramachandran, A.V.(2004). Alterations in carbohydrate metabolism and pancreatic islet responses in pigeons treated with pineal indoles and p-chloro phenylalanine. J. Tissue Res., 4(1): 153-156.
- Patel, M.M and Ramachandran, A.V.(1992). *In vitro* influence of hormones on transport of glucose and glycogen in liver and muscle of pinealectomized pigeons, Columba livia. Gmelin. Ind. J. Expt. Biol., 30: 211-213.
- Peschke E, Fautek J-D, MuBhoff U, Schmidt F, Beckmann A, Peschke D.(2000). Evidence for a melatonin receptor within pancreatic islets of neonate rats: functional, autoradiographic and molecular investigations. J Pineal. Res., 28:156-164.

- Peschke E., Peschke D., Hammer T., Csernus V.(1997). Influence of melatonin and serotonin on glucose-stimulated insulin release from perifused rat pancreatic islets *in vitro*. J. Pineal Res., 23. 156-163.
- Peschke, E., D. Peschke (1998). Evidence for a circadian rhythm of insulin release form perifused rat pancreatic islets. Dibetologia., 41: 1085-1092.
- Petronio, I. and Tavazza, D (1958). Effetti isotomorfologici della prolungata somministrazipne di un estratto epidisario acquoso in ratti ipotisectomizzati. Arch. E. Maragliano. Patol. Clin., 14: 1761-1777.
- Picinato, M.C., Haber, E.P., Carpinelli, A.R. (2002). Daily rhythm of glucose-induced insulin secretion by isolated islets from intact and pinealectomized rat. J. Pineal Res., 33: 172-177.
- Pickup, J. C. and Williams G. (2003). Textbook of Diabetes. Blackwell Science Ltd. U.S.A. (3rd Ed).
- Pictet, R. and Rutter, W. J. (1972). Development of the embryonic pancreas. In: Steiner, D. F., Frenkel, N. (Eds). Handbook of Physiology, Section 7. American Physiology Society, Washington, DC, pp. 25-66.
- Pieri C, Marra M, Moroni F, Recchioni R, Marcheselli F. (1994). Melatonin, a peroxyl radical scavenger more efficient than vitamin E. Life Sci., 55: PL271-PL276.

- Poeggeler, B., R. J. Reiter, R. Hardeland, D. X. Tan, L. R. Barlow-Walden. (1996). Melatonin and structurally related endogenous indoles act as potent electron donors and radical scavengers *in vitro.* Redox Report., 2: 179-184.
- Poon, A.M., Choy, E.H and Pang, S.F. (2001). Modulation of blood glucose by melatonin: a direct action on melatonin receptors in mouse hepatocytes. Biol. Signals., 10: 367-379.
- Poon, A.M.S. and Pang, S.F. (1994). Modulation of 2(^{125}I) Iodomelatonin binding sites in the guinea pig spleen by melatonin injection is dependent on the dose and period but not the time. Life Sci., 54: 1441-1448.
- Popov, A.V., Zerubin V V., Arushanian E.R , Luneva T.M.(1990). The effect of melatonin and epiphysectomy on the function of the mono-oxygenase system in rat liver. Biull. Eksp. Biol. Med., 110: 478-480.
- Portha, B., Blondel O, Serradas P, Mc Evoy R, Girox M H, Kergoat. (1989). The rat models of non-insulin dependent diabetes induced by neonatal streptozotocin. Diabete Metab., 15: 61-75.
- Portha, B., Picon L, Rosselin G. (1979). Chemical diabetes in the adult rats as the spontaneous evolution of neonatal diabetes. Diabetologia., 17 371-377.
- Prunet-Marcassus B, Ambid L, Viguerie-Bascands N, Penicaud L, Casteilla L. (2001). Evidence for a direct effect of melatonin

on mitochondrial genome expression of Siberian hamster brown adipocytes. J. Pineal Res., 30: 108-115.

- Puy, H., Deybach, J-Ch., Bogdan, A., et al (1996). Increased delta-aminolevulinic acid and decreased pineal melatonin production: a common event in acute porphyria studies in the rat. J. Clin. Invest., 97: 104-110.
- Ramachandran A.V. (2002) Pineal and glucoregulation in vertebrates with special emphasis on aves. In "Treatise on pineal gland and melatonin". Science Publishers Inc (Enfield (NH), USA, Plymouth, UK)., 13: 239-266.
- Rao, V. S. N , F. A. Santos, R. M. Silva and M. G. Teixiera (2002). Effects of nitric oxide synthetase inhibitors and melatonin on the hyperglycemic response to streptozotocin in rats. Vascular Pharmacology., 38(3): 127-130.
- Rasmussen D D, Boldt B M, Wilkinson C W. (1999). Daily melatonin administration at middle age suppresses male rat visceral fat, plasma leptin and plasma insulin to youthful levels. Endocrinology , 140: 1009-1012.
- Rasmussen, H. (1975). Mechanism of hormone action, In: Endocrinology and Diabetes. Kryston, L.3. and Shaw, R.A. Published by Grune and Stratton publishers, New York, San Francisco, London.
- Reiter R. J., Tan D. X., Acuna-Castroviejo D., Burkhardt S., Kabrownik M (2000). Melatonin: Mechanism and action as an antioxidant. Curr. Top. Biophys., 24: 171-183.

- Reiter R. J., Tan D. X., Qi W. B. (1998). Suppression of oxygen toxicity by melatonin. Acta Pharmacol Sin., 19: 575-581.
- Reiter R. J., Tang L., Garcia J. J., Munoz-Hyos A. (1997). Pharmacological actions of melatonin in oxygen radical pathophysiology Life Sci., 60: 2255-2271.
- Reiter, R. J. (1992). The aging pineal gland and its physiological consequences. BioEssays , 14: 169-175.
- Reiter, R. J , C. S. Oh, O. Fujimori (1996). Melatonin-its intracellular and genomic actions. Trends Endocrinol. Metab., 1: 22-27.
- Reiter, R. J., D. X. Tan, B Poeggeler, A. Menendez-Pelaez, L. D. Chen, S. Saarela (1994). Melatonin as a free radical scavenger: Implications for aging and age-related diseases. Ann. N. Y. Acad. Sci., 719: 1-12.
- Reiter, R. J., Melchiorri, D., Sewerynеck, E., Poeggeler, B., Barlow-Walden, L., Chuang, J., Ortiz, G. G. and Acuna-Castroviego, D. (1995). A review of the evidence supporting melatonins role as an antioxidant. J. Pineal Res., 18: 1-11.
- Reiter, R.J. (1991). Pineal melatonin: cell biology of its synthesis and its physiological interactions Endocr. Rev., 12: 151-180.
- Reiter, R.J. (1993) Interactions of the pineal hormone melatonin with oxgen-centered free radical: A brief review. Braz. J. Med. Biol. Res., 26(11): 11141-1155.

- Reiter, R.J. (1997). Antioxidant activities of melatonin. Adv. Pharmacol , 38: 103-117.
- Reppert, S. M (1997). Melatonin receptors, molecular biology of a new family of G protein-coupled receptors. J. Biol. Rhythms., 12 528-531.
- Reppert, S. M. and Klein, D. C. (1978). Transport of maternal [^{3}H] melatonin to suckling rats and the fate of [^{3}H] melatonin in the neonatal rat. Endocrinology., 102: 582-588.
- Reppert, S. M. D. R. Weaver, T. Ebisawa. (1994). Cloning and characterization of a mammalian melatonin receptor that mediates reproductive and circadian responses. Neuron., 13: 1177-1185.
- Reppert, S. M., C. Godson, C. D. Mahle, D. R. Weaver, S. A. Slaugenhaupt, J. F. Gusella. (1995a). Molecular characterization of a second melatonin receptor expressed in human retina and brain: The Mel 1b melatonin receptor. Proc. Natl. Acad. Sci. USA., 92: 8734-8738.
- Reppert, S. M., D. R. Weaver, C. Godson (1996b). Melatonin receptors step into the light: Cloning and classification of subtypes. Trends Pharmacol. Sci., 17: 100-102.
- Reppert, S. M., D. R Weaver, T. Ebisawa, C. D. Mahle, L. F. JR. Kolakowski (1996a). Cloning of melatonin related receptor from human pituitary. FEBS Lett., 386: 219-224.
- Reppert, S. M., D. R. Weaver, V. M. Cassone, C. Godson, L. F. Kolakowski JR. (1995b). Melatonin receptors are for the birds:

Molecular analysis of two receptor subtypes differentially expressed in chick brain. Neuron., 15: 1003-1015.

- Rodriguez V., Mellado C., Alvarez E., De Diego J.G., Blazquez E (1989). Effect of pinealectomy on liver insulin and glucagon receptor concentrations in the rat. J. Pineal Res., 6: 77-88.
- Rorsman, P., Berggren, P-O., Bokvist, K., Efendic, S. (1990). ATP-regulated K^+ channels and diabetes mellitus. News Physiol. Sci., 5: 143-147
- Rosenberg L (1995). *In vivo* cell transformation: neogenesis of B cells from pancreatic ductal cells. Cell Transplant., 4: 371-383.
- Saarela S., Reiter R.J. (1994). Function of melatonin in thermoregulatory processes. Life Sci., 54· 295-311
- Sakurai, K. and Ogiso, T. (1995). Effect of ferritin on λDNA strand breaks in the reaction system of alloxan plus NADPH-cytochrome P450 reductase· ferritin's role in diabetogenic action of alloxan. Biol. Pharm. Bull., 18: 262-265.
- Sakurai, K. and T. Miura (1989). Generation of free radicals by alloxan in the presence of bovine albumin: A role of sulfhydryl groups in alloxan cytotoxicity. Biochem. Int., 19: 405-412.
- Sandler, S. and Swenne, I. (1983). Streptozotocin, but not alloxan, induces DNA repair synthesis in mouse pancreatic islets *in vitro*. Diabetologia , 25: 444-447.
- Santer, R., Schneppenheim, R., Dombrowski, A., Gotze, H., Steinmann, B., Schaub, J. (1998). Mutations in GLUT-2, the

gene for the liver-type glucose transporter, in patients with Fanconi-Bickel syndrome. Nat Genet., 18: 298.

- Sauer, L A, Dauchy R T, Blask D E. (2001). Melatonin inhibits fatty acid transport in inguinal fat pads of hepatoma 7288CTC – bearing and normal Buffalo rats via receptor-mediated signal transduction. Life Sci., 68: 2835-2844.
- Seidner, G., Alvarez, M. G , Yeh, J. I. (1998) GLUT-I deficiency syndrome caused by haploinsufficiency of the blood brain barrier hexose carrier. Nat. Genet., 18: 188-191.
- Seifter, S., Dayton, S , Novic, B. and Muntywler, V. (1950) The estimation of glycogen with anthrone reagent Arch. Biochem., 25: 191-200
- Shima T., Chun S.J., Niijima A., Bizot-Espiard J.G., Guardiola-Lemaitre B., Hosokawa M., Nagai K. (1997). Melatonin suppresses hyperglycemia caused by intra-cerebroventricular injection of 2-deoxy-D-glucose in rats. Neurosci. Lett., 226: 119-122.
- Sjoholm A. (1993) (Invited review). Role of polyamines in the regulation of proliferation and hormone production by insulin secreting cells. Am J. Physiol., 264: C501-C518.
- Sjoholm, A., Arkhammar, P., Welsh, N., Bokvist, K., Rorsman, P., Hallberg, A. *et al.* (1993). Enhanced stimulation-secretion coupling in poyamine-tepleted insulinoma cells. An affect involving increased cytoplasmic Ca^{++} inositol phosphate

generation an forbol ester sensitivity. J Clin. Invest., 92: 1910-1917.

- Smith, P H. and Porte, D. Jr. (1976). Neuropharmacology of the pancreatic islets. Ann. Rev. Pharm. Toxicol., 16: 269-285.
- Song, Y., Tam P C., Poon A.M.S., Brown G M., Pang S.F. (1995). 2-(^{125}I) Iodomelatonin-binding sites in the human kidney and the effect of guanosine 5'-O-(3-thioitriphosphate). J. Clin. Endocrinol. Metab., 80: 1560-1565.
- Sorenson R L, Breje T C, Hegre O D, Marshal S, Anaya P and Sheridan, J D (1987). Prolactin *in vitro* decreases the glucose stimulation, enhances insulin secretion and increases dye coupling among islet B cells. Endocrinology., 121: 1447-1453.
- Stefinova, V., L. Smetanova, V Grossmann and P. Anzenbacher (2002). *In vitro* and *In vivo* assessment of the antioxidant activity of melatonin and related indole derivatives. Gen. Physiol. Biophys., 21: 153-162
- Swenne, I. (1985). Glucose-stimulated DNA replication of pancreatic islets during the development of the rat fetus. Effect of nutrients, growth hormone, and triiodothyronine. Diabetes., 34(8): 803-807.
- Szkudelski, T. (2001). The mechanism of alloxan and streptozotocin action in B cells of the rat pancreas. Physiol. Res., 50: 536-546.
- Takasu, N., I Komiya, T. Asawa. Y. Nagasawa, T. Yamada. (1991). Streptozotocin-and-alloxan-induced H_2O_2 generation

and DNA fragmentation in pancreatic islets. H_2O_2 as a mediator for DNA fragmentation. Diabetes 40: 1141-1145.

- Tamarkın L , Baird C.J., Almeida O.F.X. (1985). Melatonin-a coordinating signal for mammalian reproduction? Science, 227: 714-720.
- Tamarkın, L., Reppert, S. M., Orioff, D J., Klein, D. C., Yellon, S.M and Goldman, B D (1980). Onttogeny of the pineal melatonın rhythm in the Syrian and Siberian hamsters and in the rat. Endocrinology., 107: 1061-1064.
- Tan D.X , Chen L.D., Poegeller B., Manchester L C., Reiter R.J.(1993a). Melatonin: A potent, endogenous hydroxyl radical scavenger. Endocrin J., 1· 57-60.
- Tan D.X., Poegeller B., Reiter R.J., Chen L.D., Chen S., Manchester L.C., Barlow-Walden L.R.(1993b) The pineal hormone melatonin inhibits DNA-adduct formation induced by the chemical carcinogen safrole *in vivo.* Cancer Lett., 70: 65-71.
- Trinder, P. (1969). Determination of blood glucose using 4-amino phenazone as oxygen acceptor. J. Clin. Pathol., 22(2): 246.
- Trinder, P. (1969). Glucose estimation by glucose oxidase method using phenol and 4-aminophenazone. Ann. Clin. Biochem., 6: 24-31.
- Turner, T. T. and A. D. Johnson (1973). The metabolic activity of the bovine epididymis. Reprod. Fert , 34: 201-213

- Valtonen M., Vakkuri C., Blomstedt L. (1995). Autumnal timing of photoperiodic manipulation critical via melatonin to winter pelage development in mink Anim Sci., 61: 589-596.
- Van Cauter E (1998). Putative roles of melatonin in glucose regulation. Therapie , 53: 467-472.
- Vane Vaughan, M. K., Richardson, B. A., Craft, C. M., Powanda, M. C., Reiter, R. J. (1982). Interaction of ageing, photoperiod and melatonin on plasma thyroid hormones and cholesterol levels in female Syrian hamsters Gerontology., 28: 345.
- Vanececk Jiri (1998). Cellular mechanism of melatonin action. Physiol. Rev., 78: 687-721.
- Vijaylakshmi, B., Thomas, C. R., Reiter, R. J., Herman, T. S. (2002). Melatonin: from basic research to cancer treatment clinics. J. Clin. Oncol., 20: 2575-2601.
- Wade G.N., Bartness T J.(1984). Seasonal obesity in Syrian hamsters: Effects of age, diet, photoperiod and melatonin. Am. J. Physiol., 247: R328-R334.
- Walsh H.A., Daya S., Whiteley C.G.(1994). Mode of inhibition of rat liver tryptophan 2,3-dioxygenase by melatonin. J. Pineal Res., 16. 188-192.
- Wang R N, Bouwens L, Kloppel G. (1996). Beta-cell growth in adolescent and adult rats treated with streptozotocin during the neonatal period Diabetologia , 39: 548-557.

- Wang R N, Kloppel G, Bouwens L. (1995). Duct-to-islet-cell differentiation and islet growth in the pancreas of duct-ligated adult rats. Diabetologia., 38: 1405-1411.
- Weaver, D. C., M. L. McDaniel, P. E. Lacy. (1978) Alloxan uptake by isolated islets of langerhans. Endocrinology., 102: 1847-1855.
- Weaver, D.R. (2000). Roles of melatonin in development. In: Melatonin after four decades, (ed) James Olcese, Kluwer Academic/Plenum publishers, New York.
- Weir G C, Leahy J L, Bonner-Weir S. (1986). Experimental reduction of B-cell mass· implications for the pathogenesis of diabetes. Diabetes/Metabolism Rev., 2: 125-161.
- Welsh M, Mares J, Oberg C, Karlsson T. (1993). Genetic factors of importance for B-cell proliferation. Diabetes Metab. Rev., 9: 25-36.
- Welsh, M. (1989). Glucose regulation of insulin gene expression. Diabete Metab., 15: 367-371.
- Westermark P, Wilander E. (1978). The influence of amyloid deposits on the islet volume in maturity onset diabetes mellitus. Diabetologia., 15: 417-421.
- Williams L.M , Hannah L T., Adam C.L., Bourke D.A.(1997). Melatonin receptors in red deer fetuses (Cervus elaphus). J. Reprod. Fert., 110: 145-151.
- Winterbourn, C. C., W. B. Cowden, H. C. Sutton. (1989). Auto-oxidation of dialuric acid, divicine and isouramil. Superoxide

dependent and independent mechanism. Biochem. Pharmacol., 38: 271-277

- Wolden-Hanson, T, Mitton, Dr, McCants, RL,Yellon, SM, Wilkinson, CW, Matsumoto, AM, Rasmussen, DD. (2000). Daily melatonin administration to middle-aged rats suppresses body weight, intraabdominal adiposity, and plasma leptin and insulin independent of food intake and total body fat. Endocrinology., 2: 487-497.
- Wollheim, D B. and Sharp, G. W. G. (1981). Regulation of insulin release by calcium. Physiol. Rev., 61: 914-973.
- Woodward W.D., Fisher J.R.(1976) A possible role for melatonin in regulation of chock liver xanthine dehydrogenase activity. Arch Biochem. Bio-Phys., 173: 389-391.
- Wright, E. M., Turk, E., Zabel, B., Mundlos, S., Dyer, J. (1991). Molecular genetics of intestinal glucose transport. J. Clin. Invest., 88: 1435-1440.
- Wurtman, R.J., Axelrod, J., Chu, E W., Fischer, J.E. (1963). Melatonin is a pineal substance: Effect on the rat ovary. Science., 141: 277-278.
- YU, HS, Reiter, R.J.(1993). Melatonin: Biosynthesis, physiological effects and clinical applications. CRC Press, Boca Raton, FL.
- Zanquetta M. M., Patricia M. Seraphim, Doris H. Sumida, Jose Cipolla-Neto and Ubiratan F. Machado (2003). Calorie restriction reduces pinealectomy-induced insulin resistance by

improving GLUT-4 gene expression and its translocation to the plasma membrane. J. Pineal. Res., 35: 141-148.

- Zemen M., Vyboh P., Jurani M., Lamosova D., Kostal L., Bilcik B., Blazicek P., Juraniova E.(1993). Effect of exogenous melatonin on some endocrine, behavioral and metabolic parameters in Japanese quail (Coturnix coturnix japonica). Comp. Biochem. Physiol. Comp. Physiol., 105: 323-328.
- Zhang, H., G. Gao, U T. Brunk. (1992). Extracellular reduction of alloxan results in oxygen radical-mediated attack on plasma and lysosomal membranes. Acta. Pathol. Microbiol. Immunol. Scand., 100: 317-325.
- Ziv E, Shafrir E, Kalman R, Galer S, Bar-On H. (1999). Changing patterms of prevalence of insulin resistance in Psammomys obesus, a model of nutritionally-induced type 2 diabetes. Metabolism., 48: 1549-1554.