

Micronutrientes e Elementos Traço no Câncer

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"A saúde não está na farmácia, ela se encontra na quitanda"
JFJ

Temos aqui os resumos de 79 artigos discorrendo sobre a influência dos micro nutrientes nos pacientes com câncer. Na seqüência temos os autores, local, título e finalmente o resumo. Devemos usar o bom senso e a experiência vivida para a interpretação de cada um dos estudos. É muito importante lembrar que principalmente nos trabalhos das Universidades da América do Norte encontramos o maior número de "conflitos de interesse", que na maioria das vezes passam despercebidos até para os pesquisadores mais experientes. Sabe-se muito bem que a maioria dos trabalhos são financiados pela indústria farmacêutica, que não têm interesse algum em divulgar os efeitos benéficos dos micronutrientes e antioxidantes no tratamento das doenças degenerativas, as quais são a maior fonte de lucro porque propiciam o uso contínuo de medicamentos sintomáticos/palativos. Os micronutrientes e os elementos traço são facilmente obtidos da alimentação com boa quantidade de frutas, verduras, legumes e grãos integrais. Precisamos ter cuidado com os agrotóxicos, desta maneira vamos escolher alimentos da agricultura orgânica e vamos banir os enlatados e os embutidos. NO:1 AU:Herberg S; Galan P; Preziosi P; Roussel AM; Arnaud J; Richard MJ; Malvy D; Paul-Dauphin A; Briancon S; Favier A AD:Institut Scientifique et Technique de la Nutrition et de l'Alimentation/CNAM, Paris. TI:Background And Rationale Behind The SU.VI.MAX Study, a prevention trial using nutritional doses of a combination of antioxidant vitamins and minerals to reduce cardiovascular diseases and cancers. SUPPLEMENTATION EN VITAMINES ET MINERAUX ANTIOXYDANTS Study. SO:Int J Vitam Nutr Res. 1998. 68(1). P 3-20. AB:The "SUPPLEMENTATION EN VITAMINES ET MINERAUX ANTIOXYDANTS" (SU.VI.MAX) study is a randomized double-blind, placebo-controlled, primary prevention trial designed to test the efficacy of daily supplementation with antioxidant vitamins (vitamin C, 120 mg; vitamin E, 30 mg; and beta-carotene, 6 mg) and minerals (selenium, 100 micrograms; and zinc, 20 mg), at nutritional doses (one to three times the daily recommended dietary allowances), in reducing the frequency of major health problems in industrialized countries, and especially the main causes of premature death (cancers and cardiovascular diseases). The study involves 12,735 eligible subjects (women aged 35 to 60 years; men aged 45 to 60 years) included in 1994 in France. They will be followed up for 8 years. The objectives and the specific design of this intervention study are linked to its public health aim. The targeted population is the general population (not simply high-risk subjects) and the antioxidant agents tested are being administered at a level which is not pharmacologic and which may be attained by dietary intake of natural sources of these micronutrients and/or enriched foods. The amounts we are testing in the SU.VI.MAX study are those which, in observational studies have been associated with the lowest risk of diseases. This report presents the rationale and discusses the justification of the design, doses and combination of antioxidant micronutrients chosen in the SU.VI.MAX study. NO:3 AU:Patterson RE; White E; Kristal AR; Neuhauser ML; Potter JD AD:Fred Hutchinson Cancer Research Center, Seattle, WA 98109-1024, USA. TI:Vitamin Supplements And Cancer Risk: The epidemiologic evidence [see comments] SO:Cancer Causes Control. 1997 Sep. 8(5). P 786-802. AB:This report reviews published epidemiologic research on the associations of vitamin and mineral supplementation with cancer risk. Although the literature on nutrition and cancer is vast, few reports to date have addressed supplemental nutrients directly (seven clinical trials, 16 cohort, and 36 case-control studies). These studies offer insight into effects of nutrients that are distinguishable from effects of other biologically active compounds in foods. Randomized clinical trials have not shown significant protective effects of beta-carotene, but have found protective effects of: alpha-tocopherol against prostate cancer; mixtures of retinol/zinc and beta-carotene/alpha-tocopherol/selenium against stomach cancer; and selenium against total, lung, and prostate cancers. Cohort studies provide little evidence that vitamin supplements are associated with cancer. Case-control studies have reported an inverse association between bladder cancer and vitamin C; oral/pharyngeal cancer and several supplemental vitamins; and several cancers and vitamin E. A randomized clinical trial, a cohort study, and a case-control study have all found inverse associations between colon cancer and vitamin E. Overall, there is modest evidence for protective effects of nutrients from supplements against several cancers. Future studies of supplement use and cancer appear warranted; however, methodologic problems that impair ability to assess supplement use and statistical modeling of the relation between cancer risk and supplement use need attention. NO:4 AU:Taylor PR; Albanes D; Tangrea JA TI:To Supplement Or Not To Supplement, that is the question [editorial; comment] SO:Cancer Causes Control. 1997 Sep. 8(5). P 685-7. CM:Comment on: Cancer Causes Control 1997 Sep;8(5):786-802 AU:Pezonaga I; Taylor A; Dobrota M TI:The Effects Of Platinum Chemotherapy On essential trace elements. SO:Eur J Cancer Care (Engl). 1996 Jun. 5(2). P 122-6. AB:The effects of cisplatin chemotherapy on the metabolism of essential trace elements were investigated in 12 patients before and after treatment with cisplatin. In serum, the mean post-treatment concentrations of Cu 913.91 mumol l⁻¹, Zn (9.57 mumol l⁻¹) and Mg (0.54 mumol l⁻¹) were significantly reduced compared with the pre-treatment levels 919.35, 11.86 and 0.67) while Se, caeruloplasmin and C-reactive protein concentrations were unaltered. Urinary excretion of Cu, Mg and Zn were enhanced. The urinary N-acetyl-beta-D-glucosaminidase activity (a marker of proximal renal tubular dysfunction) was also increased and suggests that the mechanism for decrease of certain trace elements in serum during treatment could be increased urinary excretion caused by impaired cellular metabolism. It is not clear whether the loss of trace elements via the urine has any implication for the clinical status of cancer patients treated with cisplatin. NO:6 AU:Gauchez AS; Riondel J; Fernandes-Carlos T; Jacrot M; Guiraud P; Coudray C; Calop J; Favier A AD:Groupe de Recherche et d'Etudes sur les Pathologies Oxydatives (GREPO), La Tronche, France. TI:Effect Of Oestrone On The Natural killer (NK) cell activity, antioxidant status and tumour growth in athymic mice xenografted with human tumours. SO:Anticancer Res. 1996 Mar-Apr. 16(2). P 853-9. AB:Natural killer (NK) cells have been described as being very sensitive to oxidative stress. Thus it has been previously shown that chronic administration of oestrone in drinking water of athymic mice xenografted with a wide variety of human tumours, increases their growth and development. In this study an investigation was made to see whether oestrone supplementation could influence the NK cell activity by changes in the antioxidant defences which result in an oxidative stress and influence the proliferation of tumours. Supplementary oestrone was administered in drinking water of athymic mice xenografted with two different human tumours which lack oestrogen receptors: a bladder carcinoma and a small-cell lung carcinoma. The growth of the urothelial carcinoma was poorly affected by oestrone, but oestrone significantly (p<0.01) increased the proliferation of the small-cell lung carcinoma. The average uterus weight was increased by 62% in oestrone treated mice with no modifications in plasma zinc and selenium status, nor in erythrocyte copper zinc superoxide dismutase level. Nevertheless a slight decrease in erythrocyte glutathione peroxidase activity was noted. Trace elements and antioxidant enzymes in liver homogenates remained unchanged. Oestrone treatment also had no effect on plasma and liver lipid peroxides. The immune response was evaluated by measuring NK activity of splenocytes against 51Cr labelled YAC-I target cells. A 35.5% decrease in the NK activity (p<0.001) was observed after oestrone treatment and may be responsible for graft tolerance. However, the results of these experiments seem to exclude the role of oxidative stress in the modulation of NK activity. NO:7 AU:Koyama H AD:Department of Environmental Health Sciences, Tohoku University School of Medicine. TI:[Trace Elements: Mechanistic Aspects Of Anticarcinogenic action] SO:Nippon Rinsho. 1996 Jan. 54(1). P 52-8. AB:Trace elements play important roles and are increasingly recognized as versatile anticarcinogenic agents. Several biologic mechanisms have been proposed to explain how trace elements could reduce the incidence of a number of different cancers. The proposed mechanisms involve the antioxidant potential of trace element dependent enzyme system, induction of metallothionein, effects on immune response and DNA repair system, alterations of carcinogen metabolism, and apoptosis of the initiated cells. However, epidemiologic studies have failed to support the hypothesis that enhanced trace element status reduces the risk of cancer. Furthermore, several animal and in vitro studies have shown carcinogenic potentials of trace elements. A few chemoprevention trials with trace elements have now been conducted. NO:8 TI:Trace

Elements In Vascular Disease, Tumor prevention, growth and aging, and environmental studies. Proceedings of the 3rd annual meeting of the Italian Association or the Study of Trace Elements in Living Organisms. Modena, Italy, October 28-29, 1994. SO: Biol Trace Elem Res. 1996 Jan. 51(1). P 1-131. NO:9 AU: Bender DA AD: Department of Biochemistry and Molecular Biology, University College London, United Kingdom. TI: Tryptophan and niacin nutrition--is there a problem? SO: Adv Exp Med Biol. 1996. 398P 565-9. NO:10 AU: Grinevich IuA; Bendiug GD TI: [The mechanism of the immunomodulating action of Beres Drops Plus] SO: Lik Sprava. 1995 May-Jun. (5-6). P 133-5. AB: Beres Drops Plus were found to raise the number of E-RFCs, being formed by lymphocytes of peripheral blood of subjects presenting with low levels of T-cells, and to increase the production of substances possessing thymosine-like activity (STLA) by lymphocytes and epithelial cells of the murine thymus gland. In vitro the drug preparation in question enhances endocrine function of thymus in normal animals and the organism's capacity to induce STLA synthesis following thymectomy. These findings are useful in devising rational schemes of rehabilitation of immune system with the drug preparation Beres Drops Plus in secondary immunodeficiency states developing in cases presenting with precancer conditions, malignant neoplasia, in those subjects having taken part in the elimination of the Chernobyl NPP accident aftermath, those residing on the territories controlled, as well as evolving on account of aging.

NO:11 AU: Yoshinaga J; Suzuki T; Morita M; Hayakawa M AD: National Institute for Environmental Studies, Ibaraki, Japan. TI: Trace Elements In Ribs Of Elderly people and elemental variation in the presence of chronic diseases. SO: Sci Total Environ. 1995 Jan 27. 162(2-3). P 239-52. AB: Element concentrations in ribs obtained from elderly Japanese people (17 males and 28 females; mean age, 81.5 years) were determined by atomic absorption spectrometry (AAS), inductively coupled plasma atomic emission spectrometry (ICP-AES), and ICP mass spectrometry (ICP-MS). Nine elements--Na, Mg, P, K, Ca, Fe, Zn, Sr, and Pb--were determinable in most of the subjects by a combination of AAS and ICP-AES. The levels of these elements were generally comparable with those obtained in our previous study on ribs from younger Japanese. By the use of ICP-MS, Sn (median, 0.79 micrograms/g dry bone) and Ba (1.3 micrograms/g) were determinable in all of the subjects analysed (n = 35) and 18 other elements at lower concentration levels were also detected in some of the subjects. An exploratory statistical analysis was carried out to find element(s) of which level(s) in rib vary in the presence of degenerative chronic diseases, using information obtained from pathological autopsy reports and medical histories of the present subjects. It indicated that (i) Pb and Zn, (ii) Ba, and (iii) Sr levels in the ribs varied in the presence of cancer, cerebrovascular damage, and bone problems, respectively. The present results were discussed in relation to the results of the previous epidemiologic and experimental studies.

NO:12 AU: Neve J; Wasowicz W; Quivy D; Parij N; Van Gossum A; Peretz A AD: Laboratory of Pharmaceutical Chemistry, Free University of Brussels, Belgium. TI: Lipid Peroxidation Assessed By Serum Thiobarbituric acid reactive substances in healthy subjects and in patients with pathologies known to affect trace element status. SO: Biol Trace Elem Res. 1995 Jan-Mar. 47(1-3). P 147-53. AB: Serum thiobarbituric acid reactive substances (TBARS), Zn, Cu, and Se concentrations were determined in 47 healthy adults and in patients with diseases, such as renal insufficiency, insulin-dependent diabetes mellitus, chronic pancreatitis, liver cirrhosis, or cancer, in order to clarify the relationship between this indicator of lipid peroxidation and antioxidative trace element status. TBARS levels were higher than control values in all pathological cases, except in cancer patients. Cu levels in patients highly correlated with ferroxidase ceruloplasmin activity (r = 0.86), but were only statistically different from controls in diabetics. Zn levels were lower than normal in dialysis, liver cirrhosis, and cancer patients. Se levels were significantly decreased in all pathological cases. Half of the subjects with liver cirrhosis or renal insufficiency and 3/4 of chronic pancreatitis or cancer patients had an active inflammatory process. Despite intense modifications in determined indicators, no clear correlation could be demonstrated between the different parameters. Basic antioxidative trace element status and inflammation are therefore not major determinants of TBARS levels in normal and in pathological conditions, despite of the frequent association of low serum Zn and mainly low serum Se with high TBARS levels.

NO:13 AU: Faber M; Coudray C; Hida H; Mousseau M; Favier A AD: Laboratoire de Biochimie C, Hopital Albert Michallon, Grenoble, France. TI: Lipid Peroxidation Products, And Vitamin And trace element status in patients with cancer before and after chemotherapy, including adriamycin. A preliminary study. SO: Biol Trace Elem Res. 1995 Jan-Mar. 47(1-3). P 117-23. AB: Adriamycin is a potent chemotherapeutic agent used in the treatment of human neoplastic diseases. A major side effect limiting the use of this drug is its toxic effect on the heart. Several hypotheses have been proposed to explain the cardiotoxicity of Adriamycin. However, the most plausible hypothesis seems to be the reduction of Adriamycin and free radical production, which induces lipid peroxidation and oxidative damages in the heart. We have thus undertaken this preliminary study to investigate Adriamycin-induced lipid peroxidation by the measurement of plasma thiobarbituric acid reactant materials and antioxidant systems, namely glutathione content, glutathione peroxidase activity, and vitamin and trace element status, in patients with cancer before and after chemotherapy, including Adriamycin. The concentration of thiobarbituric acid reactant materials in plasma of patients with cancer was higher than in controls and was further increased after chemotherapy. Blood glutathione and plasma glutathione peroxidase activity, as well as plasma zinc and selenium in patients with cancer, were decreased, but not further modified by chemotherapy. However, only zinc and selenium levels reached a significant level. In contrast, plasma vitamin E and beta-carotene levels were not significantly increased in patients with cancer. Finally, plasma vitamin A and copper levels were not modified either in patients with cancer or by chemotherapy.

NO:14 AU: Key T AD: Cancer Epidemiology Unit, Radcliffe Infirmary, Oxford. TI: Micronutrients And Cancer Aetiology: The Epidemiological evidence. SO: Proc Nutr Soc. 1994 Nov. 53(3). P 605-14. AB: Micronutrient deficiencies occur most commonly in poor countries and, therefore, are most likely to be associated with cancers common in these countries. Epidemiological studies are hampered by inaccurate measurement of micronutrient intake and by the correlations between intakes of many nutrients. The strongest evidence for a protective effect of micronutrients is for oesophageal cancer. The identity of the micronutrients is not certain, but may include retinol, riboflavin, ascorbic acid and Zn; alcohol, smoking and dietary nitrosamines increase the risk for oesophageal cancer. For stomach cancer there is good evidence that fruit and vegetables are protective. The protective effect of these foods might be largely due to ascorbic acid, but other nutrients and non-nutrients may also be important; the risk for stomach cancer is increased by salt, some types of preserved foods, and by infection of the stomach with the bacterium *Helicobacter pylori*. The risk for lung cancer appears to be reduced by a high intake of fruit and vegetables, but it is not clear which agents are responsible and the major cause of lung cancer is cigarette smoking. Diet is probably the major determinant of the risk for colo-rectal cancer; there is evidence that fruit and vegetables and fibre reduce risk and that meat and animal fat increase risk, but there is no convincing evidence that these relationships are mediated by micronutrients. The risk for cervical cancer is inversely related to fruit and vegetable consumption and, therefore, to consumption of carotenoids and ascorbic acid, but the major cause of this cancer is human papillomavirus and it is not yet clear whether the dietary associations indicate a true protective effect or whether they are due to confounding by other variables. The evidence that micronutrients are important in the aetiology of either breast cancer or prostate cancer is weak, but the possible roles of 1,25-dihydroxycholecalciferol and alpha-tocopherol in prostate cancer require further study.

NO:15 AU: Day NE; Bingham SA TI: Re: Nutrition Intervention Trials In Linxian, China: supplementation with specific vitamin/mineral combinations, cancer incidence, and disease-specific mortality in the general population [letter; comment] SO: J Natl Cancer Inst. 1994 Nov 2. 86(21). P 1645-8.

NO:16 AU: Durosinmi MA; Ojo JO; Oluwole AF; Akanle OA; Spyrou NM AD: Department of Haematology, Obafemi Awolowo University, Ile-Ife, Nigeria. TI: Study of trace elements in blood of cancer patients by proton-induced X-ray emission (PIXE) analysis. SO: Biol Trace Elem Res. 1994 Fall. 43-45P 351-5. AB: Proton-induced X-ray emission (PIXE) analysis was employed to determine the concentrations of six elements in the plasma and erythrocytes of 18 cancer subjects (15 males and 3 females) with neoplastic disorders and in 70 controls (35 males and 35 females). It was found that the concentrations of Br, K, and Zn were significantly elevated in the erythrocytes of the cancer subjects compared to the controls, whereas the concentration of Fe was significantly depressed, but with no difference observed in

the concentration of Ca. In the plasma, the concentrations of Br, Cu, Ca, and K were significantly elevated, whereas the concentrations of Fe and Zn were found to be significantly depressed compared to the controls.

NO:17 AU:Gutteridge JM AD:Department of Anaesthesia & Intensive Care, Royal Brompton Hospital, London, England, UK. TI:Antioxidants, Nutritional Supplements And Life-threatening Diseases. SO:Br J Biomed Sci. 1994 Sep. 51(3). P 288-95. AB:Antioxidants are a complex and diverse group of molecules that protect key biological sites from oxidative damage. They usually act by removing or inactivating chemical intermediates that produce the ultimate oxidant. Different sites in the body have evolved to use highly specialised strategies to deal with free radicals and other reactive oxygen intermediates. Recent epidemiological evidence suggests that the development of life-threatening disease, such as cancer and heart disease, is linked to our dietary intake of micronutrients including antioxidants. Modification of dietary habits together with supplementation may provide a simple yet profound way to reduce deaths from these two major diseases. Sound scientific evidence to support a curative role for antioxidants in life-threatening diseases, however, is lacking.

NO:18 AU:Strain JJ AD:Human Nutrition Research Group, University of Ulster, Coleraine, Northern Ireland, UK. TI:Putative Role Of Dietary Trace Elements in coronary heart disease and cancer. SO:Br J Biomed Sci. 1994 Sep. 51(3). P 241-51. AB:Relatively little attention has been given to the role of dietary trace elements in oxidative processes or in the aetiologies of chronic disease processes. Iron and copper are pro-oxidants in vitro, but there is now compelling evidence that adequate body copper status is required to maintain antioxidant defences in vivo. Epidemiological evidence linking measures of high iron nutritional status with both coronary heart disease (CHD) and cancer is accumulating, although there are few mechanisms implicating iron in these disease processes apart from acting as a pro-oxidant. In contrast, low copper nutritional status may produce pro-oxidant effects and experimental evidence, especially from animal models of CHD, suggests that copper has an involvement in disease mechanisms which is much wider than simply an involvement in maintaining oxidant/antioxidant balance. Zinc is considered to have antioxidant effects in vivo but the role of zinc as an antioxidant, or in CHD and cancer processes, is presently unclear. Although selenium has for some time been recognised as an antioxidant nutrient, epidemiological data gathered to date linking this trace element with either CHD or cancer are inconsistent.

NO:19 AU:Collins A; Duthie S; Ross M AD:Rowett Research Institute, Bucksburn, Aberdeen. TI:Micro nutrients And Oxidative Stress In The aetiology of cancer. SO:Proc Nutr Soc. 1994 Mar. 53(1). P 67-75.

NO:20 AU:Sardesai VM TI:Molybdenum: An Essential Trace Element. SO:Nutr Clin Pract. 1993 Dec. 8(6). P 277-81. AB:Molybdenum is found in most foods, with legumes, dairy products, and meats being the richest sources. This metal is considered essential because it is part of a complex called molybdenum cofactor that is required for the three mammalian enzymes xanthine oxidase (XO), aldehyde oxidase (AO), and sulfite oxidase (SO). XO participates in the metabolism of purines, AO catalyzes the conversion of aldehydes to acids, and SO is involved in the metabolism of sulfur-containing amino acids. Molybdenum deficiency is not found in free-living humans, but deficiency is reported in a patient receiving prolonged total parenteral nutrition with clinical signs characterized by tachycardia, headache, mental disturbances, and coma. The biochemical abnormalities in this acquired molybdenum deficiency include very low levels of uric acid in serum and urine (low XO activity) and low inorganic sulfate levels in urine (low SO activity). Inborn errors of isolated deficiencies of XO, SO, and molybdenum cofactor are described. Although XO deficiency is relatively benign, patients with isolated deficiencies of SO or molybdenum cofactor exhibit mental retardation, neurologic problems, and ocular lens dislocation. These abnormalities seem to be caused by the toxicity of sulfite and/or inadequate amounts of inorganic sulfate available for the formation of sulfated compounds present in the brain. XO and AO may also participate in the inactivation of some toxic substances, inasmuch as studies suggest that molybdenum deficiency is a factor in the higher incidence of esophageal cancer in populations consuming food grown in molybdenum-poor soil.

NO:21 AU:Jellum E; Andersen A; Lund-Larsen P; Theodorsen L; Orjasaeter H AD:Norwegian Cancer Society, Oslo. TI:The JANUS serum bank. SO:Sci Total Environ. 1993 Nov 1. 139-140P 527-35. AB:The on-going JANUS project was initiated by the Norwegian Cancer Society in 1973. The serum bank comprises close to 0.5 million serum samples collected from 170,000 donors. From 2-16 consecutive samples are available from each donor. The sera are stored at -25 degrees C. At regular intervals the JANUS-collection is matched against the files of the Norwegian Cancer Registry. From 1973 to 1991 almost 5000 of the donors have developed some form of cancer. Frozen serum samples collected from a few months to 18 years prior to clinical recognition of their disease are consequently available for research purposes. The aim of the JANUS-project is to search in these premorbid sera for chemical, biochemical, immunological or other changes that might be indicative of cancer development at early stages. Gas chromatography-mass spectrometry and two-dimensional protein electrophoresis have been used to evaluate the stability of the frozen sera. Some recent findings are: CA125 is elevated several months prior to diagnosis of ovarian cancer; serum thyroglobulin may be a preclinical tumour marker in subgroups of thyroid cancer; low level of selenium in serum reflects increased risk of thyroid cancer; and raised antibodies in serum against Epstein-Barr virus is a risk factor for development of Hodgkin's disease. On-going research includes trace elements and cancer, and studies on lipid-profiles, diet and cancer. The serum bank may in principle be used for other purposes, e.g. in environmental studies. Analysis of sequential sera may determine chemical substances in the sera that might reflect differences in exposure to environmental pollutants in the period 1973-1991.

NO:22 AU:Stahelin HB AD:Geriatric University Clinic, Kantonsspital, Basel, Switzerland. TI:Critical Reappraisal Of Vitamins And Trace minerals in nutritional support of cancer patients. SO:Support Care Cancer. 1993 Nov. 1(6). P 295-7. AB:The potential of a high intake of fresh fruits and vegetables in cancer prevention is well established. Epidemiological studies support carotene, vitamins A, C, E and selenium as the active compounds. Antioxidant properties and direct effects (e.g. inhibition of N-nitrosamine formation or cell-to-cell interactions) are invoked. The role of other trace elements is less clear. The modulation of immune function by vitamins and trace elements remains important and affects survival. In established cancers, the site-specific differences in the diet/cancer relation require appropriate dietary changes, e.g. low fat (20% by energy) in breast cancer, or high vegetable or fruit intake in lung cancer. Single high-dose supplements (e.g. vitamin C) have proved to have no curative or life-prolonging effect. Chemotherapy and radiation increase the requirements for antioxidant compounds. Supplementation can diminish the damage induced by peroxidation. Carefully planned and monitored trials that establish the optimal intake of micronutrients as adjuvants in cancer patients are required.

NO:23 AU:Halpern GM; Trapp CL AD:Division of Rheumatology, Allergy and Clinical Immunology, University of California, Davis. TI:Nutrition And Immunity: Where Are We standing? SO:Allergol Immunopathol (Madr). 1993 May-Jun. 21(3). P 122-6.

NO:24 AU:Wingren G; Axelson O AD:Department of Occupational Medicine, University Hospital, Linköping, Sweden. TI:Epidemiologic studies of occupational cancer as related to complex mixtures of trace elements in the art glass industry. SO:Scand J Work Environ Health. 1993. 19 Suppl 1P 95-100. AB:In the art glass industry workers run increased risks of dying from several types of cancer, cardiovascular diseases, and cerebrovascular diseases. This paper considers the diseases of glass workers in relation to exposure to particular elements, a high degree of correlation being found for some of them. Case-referent evaluations showed an association between stomach cancer and exposure to a mixture of elements, namely, arsenic, copper, nickel, and manganese, and to some extent also to lead and chromium. For colon cancer, a clearly increasing trend in risk was seen with increasing use of antimony, and to some extent also with increasing use of lead, the two elements being strongly correlated. For lung cancer no obvious correlation with any metal could be found. In addition, the risk for death from cardiovascular disease was fairly evenly distributed, although slightly more related to increasing consumption of the strongly correlated metals nickel and copper.

NO:25 AU:Boffetta P AD:International Agency for Research on Cancer, Lyon, France. TI:Carcinogenicity of trace elements with

reference to evaluations made by the International Agency for Research on Cancer. SO:Scand J Work Environ Health. 1993. 19 Suppl 1P 67-70. AB:The monograph program of the International Agency for Research of on Cancer has evaluated many trace elements for their carcinogenicity to humans. Five groups of compounds were considered human carcinogens: arsenic and arsenic compounds, beryllium and beryllium compounds, cadmium and cadmium compounds, hexavalent chromium compounds, and nickel compounds. Antimony trioxide, cobalt and cobalt compounds, lead and inorganic lead compounds, methylmercury compounds, and metallic nickel were considered possibly carcinogenic to humans. Antimony trisulfide, trivalent chromium compounds, metallic chromium, ferric oxide, organolead compounds, metallic mercury, inorganic mercury compounds, selenium and selenium compounds, and titanium dioxide were not classifiable. Trace elements studied to a limited extent include copper, manganese, tin, vanadium, and zinc. Among the problems are the lack of relevant data, the definition of active species, the extrapolation of the results of experimental studies to humans, the methodological problems of epidemiologic studies, and the possible anticarcinogenic activity of some trace elements.

NO:26 TI:Carcinogenicity of trace elements. Report of a panel discussion in Stockholm 25 May 1992. SO:Scand J Work Environ Health. 1993. 19 Suppl 1P 110-1.

NO:27 AU:Peeters EG AD:World Institute of Ecology and Cancer, Brussels, Belgium. TI:The Influence Of Soil Components And drinking water on the appearance of cancer: a review. SO:J Environ Pathol Toxicol Oncol. 1992 Jul-Aug. 11(4). P 201-4. AB:The author reviews the relationships of soil and reused water with the occurrence of cancer. The effect of the soil composition on the emergence of geocancerologic diseases such as cancer of the stomach, esophagus, urinary tract, breast, bronchus, pleura, and bone is analyzed. The study also reviews geocancerologic diseases linked with the use of recycled waste water.

NO:28 AU:Ranade SS; Shingatgeri VM TI:Contribution Of Paramagnetic Trace Elements Of biological tissues to spin lattice relaxation times [letter] SO:Physiol Chem Phys Med NMR. 1992. 24(2). P 165-7.

NO:29 AU:Evetts I; Milton D; Mason R AD:Department of Chemistry, University College of Swansea, UK. TI:Trace Element Analysis In Body Fluids by glow discharge mass spectrometry: a study of lead mobilization by the drug cis-platin. SO:BioI Mass Spectrom. 1991 Mar. 20(3). P 153-9. AB:A method is described, using glow discharge mass spectrometry, to measure lead and platinum levels at the p.p.b. level in the urine of patients receiving cancer chemotherapy with the drug cis-platin. Using bismuth added as an internal standard, the method is found to compare very favourably with other quantitative techniques, and requires relatively little sample preparation. The data obtained support the idea that normally stored body lead is displaced by the platinum complexed in the drug, but only to a small extent.

NO:30 AU:Flaten TP; Bolviken B AD:Department of Chemistry, College of Arts and Science, University of Trondheim, Norway. TI:Geographical associations between drinking water chemistry and the mortality and morbidity of cancer and some other diseases in Norway. SO:Sci Total Environ. 1991 Feb. 102P 75-100. AB:Finished drinking water samples were collected from 384 waterworks that supply 70.9% of the Norwegian population. For 97 municipalities where a majority of the population has had a stable drinking water supply from at least 1965, analytical results for Si, Al, Fe, Mg, Ca, Na, Mn, Cu, Zn, Ba, Sr, K, F-, Cl-, Br-, NO3-, SO4(2-), pH, electrical conductivity, total organic carbon (TOC) and colour are correlated with municipal rates for morbidity of 16 groups of cancer (1975-84), and for mortality of 17 groups of other diseases (1974-83). Several associations are found, some of which may be real, while others are incidental due to the large number of correlations involved. The ecological design of this study implies that cause-and-effect interpretations should be made with great care.

NO:31 AU:Hietanen E AD:TYKS:n klinisen fysiologian yksikko, Turku, Finland. TI:[The Effects And Possibilities Of Clinical use of antioxidants] SO:Duodecim. 1991. 107(9). P 672-9.

NO:32 AU:De Magistris R; Cavallo G; Montella M; Memmolo W AD:Cattedra di Teniche Operatoire Generali, Universita degli Studi di Napoli I Facolta di Medicina e Chirurgia. TI:[The Function Of Trace Elements In human nutrition and their possible role in neoplastic disease] SO:Minerva Med. 1990 May. 81(5). P 371-83.

NO:33 AU:Deplazes G; Hauser SP AD:Schweizerische Krebsliga, Schweizerische Gesellschaft fur Onkologie. TI:[Cancer Treatment Using Dr. Moerman's Diet and therapy. Documentation No. 24] SO:Schweiz Rundsch Med Prax. 1990 Apr 10. 79(15). P 464-7. AB:For prophylaxis of cancer and treatment of manifest cancer Moerman recommends as the basis of his therapy a lactovegetable diet and, in addition, the '8 essential substances': vitamins A, B, C and E, iodine, sulfur, iron and citric acid. At a later stage he also recommends supplementary vitamin D and selenium. The most important aspect is the change in dietary habits required by the diet prescribed by Moerman and the ingestion of the '8 essential substances' in the form of conventional preparations. The daily cost of treatment of a prostatic cancer, for instance, ranges from about Fr. 3.- to Fr. 6.-. Side effects are not mentioned. The diet and therapy were developed by the Dutch physician Dr Moerman (1893-1988) as long ago as the 1930s. The promoters are the iridiologist J. Landman, the nutritional consultant E. Wannee and the writer R. Jochems. All three have written a book on Moerman. In Switzerland, the Lifecare Association endeavours to disseminate this form of therapy. A chronic deficiency of the '8 essential substances' is said to lead to metabolic disturbances, structural and behavioural anomalies of the regeneration tissue and alkalosis, which is claimed to be a fertile soil for the 'symbionts' that can transform healthy cells into cancer cells. Moerman came to this conclusion on the basis of his observations of pigeons. By means of a lactovegetable diet and substitution of the '8 essential substances', this metabolic disorder is said to be reversible, thus robbing the 'symbionts' of their growth medium. The results of the experiments with pigeons have, as far as we know, never been published.(ABSTRACT TRUNCATED AT 250 WORDS)

NO:34 AU:Diplock AT AD:Division of Biochemistry, United Medical School, University of London, Guy's Hospital, U.K. TI:Mineral Insufficiency And Cancer. SO:Med Oncol Tumor Pharmacother. 1990. 7(2-3). P 193-8. AB:There are excellent theoretical reasons why the mineral nutrients selenium, manganese, copper and zinc, known as the antioxidant minerals, may be involved in the prevention of cancer aetiogenesis. The biochemistry is discussed of the part played by the antioxidant minerals, in the wider context of the other dietary antioxidants vitamins A, E and C, and beta carotene, in preventing tissue damage caused by activated metabolites of oxygen. The likely part played by these oxygen metabolites is described and a detailed review given of the evidence that suggests a role for antioxidant minerals, notably selenium, in preventing carcinogenesis in a range of animal models. There follows a summary of the emerging epidemiological evidence that suggests clearly that low selenium intake is a risk factor in the aetiology of human cancer.

NO:35 AU:Fernandes G; Venkatraman J AD:Department of Medicine, University of Texas Health Science Center, San Antonio 78284-7874. TI:Micro nutrient and lipid interactions in cancer. SO:Ann N Y Acad Sci. 1990. 587P 78-91.

NO:36 AU:Drake EN 2d; Sky-Peck HH AD:Department of Chemistry, Angelo State University, San Angelo, Texas. TI:Discriminant Analysis Of Trace Element Distribution in normal and malignant human tissues. SO:Cancer Res. 1989 Aug 1. 49(15). P 4210-5. AB:Discriminant analysis of 16 trace element levels measured by ultramicro energy dispersive X-ray fluorescence in malignant and histologically normal human breast, colon, and lung tissues is shown to be a potentially valuable methodology for making malignant-normal and tissue-type classifications. Linear composites of trace elements producing optimal malignant-normal discriminations are found to differ with respect to the number and identity of elements included in the composite for breast, colon, and lung tissues. Nine-, 10-, and 11-element discriminant functions produced overall classification accuracies of 98% for breast, 100% for colon, and 100% for lung tissues, respectively. Elements found to be most important in distinguishing between malignant and normal tissues are Ca, Rb, and Zn in breast, Ca, Zn, and Fe in colon, and Fe, Mn, and Cu in lung samples. Three-group discriminations between breast, colon, and lung tissues

were 85% accurate using trace element levels in paired malignant-normal tissues and 91% accurate using trace element levels in tumor tissues only.

NO:37 AU:Marczynski B AD:Department of Biochemistry, Silesian University, Katowice, Poland. TI:Carcinogenesis As The Result Of The deficiency of some essential trace elements. SO:Med Hypotheses. 1988 Aug. 26(4). P 239-49. AB:"Energetic" biological trace elements [gallium (III), germanium (IV), silicon (silica), arsenic (V) and selenium (IV)] occurring in DNA of eukaryotic cells may improve the semiconductor properties of DNA and may influence the mechanisms that control genetic expression at the electronic level. Their roles are postulated as follows: (i) to maintain the level and direction of free sliding electrons in DNA, (ii) to modulate the electron conductivity and hole conductivity of DNA. This specific electronic nature of DNA take the form of magnetic pigeonholes in which an electric pulse is (0), or is not (1) stored as an area of local magnetisation. These types of conductivity occurring in different parts of DNA of different cells could participate in the switch on and switch off of genetic information in gene expression. This model may help to elucidate the mechanism of action of these naturally occurring antitumor agents and may help in understanding the role of trace elements in charge transport of DNA and in carcinogenesis.

NO:38 AU:Volkotrub LP; Iakovleva VV TI:[Role Of Trace Elements In The etiology and pathogenesis of tumor growth] SO:Vopr Onkol. 1988. 34(4). P 400-4.

NO:39 AU:Hinsull SM AD:Dept. Zoology, University College, Cardiff, U.K. TI:Diet, Ageing And Cancer. SO:Rev Environ Health. 1987 Jul-Dec. 7(3-4). P 201-78.

NO:40 AU:Ota DM; Kleman G; Diamond K TI:Practical Considerations In The Nutritional Management of the cancer patient. SO:Curr Probl Cancer. 1986 Jul. 10(7). P 345-98.

NO:41 AU:Leonard TK; Mohs ME; Watson RR TI:Nutrient Intakes: Cancer Causation And Prevention. SO:Prog Food Nutr Sci. 1986. 10(3-4). P 237-77. AB:High intakes of the macronutrients--proteins, lipids, and carbohydrates in the form of excess energy--have some cancer stimulating properties. On the contrary, epidemiologic and animal laboratory data indicate that high-level supplementation of some micronutrients--certain vitamins, minerals, and lipotropes, as well as some non-nutrients, most notably various types of dietary fiber, may be useful in the prevention of cancer. A wealth of data exists for macronutrients whereas most micronutrients are almost unstudied concerning their role in cancer prevention. Vitamins A, E, and C and selenium are the most well-studied micronutrients, and are recognized as effective with significant anticancer effects, at least in animal models. There are minimal data to suggest that some other micronutrients may also exert varying degrees of incidence reduction on one or more types of cancer. This is most true for folic acid, manganese, molybdenum, copper, the amino acids phenylalanine and methionine, and the lipotrope choline. Zinc and vitamins B1, B2, B6, B12 and pantothenic acid have even less data, and some data are contradictory. Therefore, it is premature to make recommendations concerning their usefulness in cancer prevention at present.

NO:42 AU:Sky-Peck HH TI:Trace Metals And Neoplasia. SO:Clin Physiol Biochem. 1986. 4(1). P 99-111. AB:Numerous trace metals induce cancerous growths in various animal species in vivo and cause mutagenic or chromosomal transformations in cells-cultured cells in vitro. The most potent is probably nickel. The present review indicates that arsenic, cadmium, chromium, nickel and probably beryllium are associated with malignant neoplasms in humans. Inhalation of these metals during processing at refineries has lead to a greater incidence of pulmonary carcinoma as well as other forms of cancer. There is an inverse relationship between the amount of selenium in the environment and the death rate from cancer in humans. Evidence is presented in this review indicating that mutagenic metal ions alter the fidelity of DNA synthesis. This has been demonstrated with purified DNA polymerases using both synthetic and natural DNA templates in vitro, and by mutagenic or carcinogenic effects in vivo. The need for further studies of the molecular effects of metal ions on DNA replication, RNA transcription and translation is indicated by these results.

NO:43 AU:Watson RR TI:Immunological Enhancement By Fat-soluble Vitamins, Minerals, and trace metals: a factor in cancer prevention. SO:Cancer Detect Prev. 1986. 9(1-2). P 67-77. AB:High intakes of some fat-soluble vitamin or trace metals have been associated with a decreased risk of cancer. A mechanism to help explain their anticancer action might be immunosuppression during deficiency or immuno-enhancement with high intakes. In vitro, retinol suppressed T-lymphocyte functions, whereas high dietary vitamin A enhanced macrophage functions. High intakes of vitamin E can enhance some anticancer, immune defenses. Selenium excess was not very suppressive of immune functions in vitro, but did retard tumor cell growth. Selenium and zinc deficiencies are associated with immunosuppression. Enhanced immune functions by high intakes of trace elements and vitamins provide a mechanism to explain in part the concomitant decreased cancer incidence.

NO:44 AU:Reilly JJ Jr; Gerhardt AL TI:Modern Surgical Nutrition. SO:Curr Probl Surg. 1985 Oct. 22(10). P 1-81.

NO:45 AU:Taylor A TI:Therapeutic Uses Of Trace Elements. SO:Clin Endocrinol Metab. 1985 Aug. 14(3). P 703-24. AB:The properties of trace elements which feature in their therapeutic activity are: binding to macromolecules (enzymes, nucleic acids, etc.) with disturbance of biological function, and interaction with other elements. These properties, particularly the binding to large molecules, are far from specific, an observation which is reflected in the very wide range of diseases in which trace elements are employed. While metal compounds have been administered for several centuries, the scientific basis for treatment with trace elements began with the use of gold compounds, initially in patients with tuberculosis and later those with rheumatoid arthritis. Although many other drugs have been developed, some of which also include metal complexes, gold has retained an important position in the treatment of this condition. The gold-induced effects upon the immunological aspects of RA are also observed in other conditions with autoimmune involvement. The antineoplastic potential of metal complexes will be further exploited by the development of less toxic compounds--of platinum and possibly also of other metals. At the same time there are improvements in the protocols for administration which increase the range of cancers responding to treatment. Perturbation of gastrointestinal activity represents another area where trace elements have an important therapeutic role, both in the control of intraluminal acidity and in the adjustment of nutrient availability. A fourth significant area of trace element therapeutics involves the central nervous system where the use of lithium has provided spectacular results in the treatment of affective and other disorders. With a very wide range of other conditions in which they are employed, therapeutic uses provide somewhat unusual illustrations of the importance of trace elements in human disease.

NO:46 AU:Hopkins GJ; Carroll KK TI:Role Of Diet In Cancer Prevention. SO:J Environ Pathol Toxicol Oncol. 1985 Jul. 5(6). P 279-98.

NO:47 AU:Tobey RA; Tesmer JG TI:Differential Response Of Cultured Human Normal and tumor cells to trace element-induced resistance to the alkylating agent melphalan. SO:Cancer Res. 1985 Jun. 45(6). P 2567-71. AB:Previous studies using cultured Chinese hamster cells indicated that pretreatment of the cells with the trace elements copper, selenium, and/or zinc resulted in increased survival of the metal-induced cultures following subsequent exposure to mono- and bifunctional alkylating agents. To ascertain whether a comparable protective response could be activated in human-derived material, a series of human normal and tumor cells was treated with these trace elements and later challenged with the alkylating agent melphalan, prior to determination of the surviving fraction via colony formation. Normal human cells derived from either newborn infants or adults exhibited an increase in survival of 7- to 9-fold when pretreated with zinc alone that increased to approximately 16-fold when these normal cells were induced with all three trace elements. In contrast, comparable pretreatment of tumor cell populations resulted in an increase in survival of 1.7-fold or less, with most types of tumors exhibiting no induced protection. These observations describing a differential inducibility of normal and tumor cells raise the possibility of a novel approach for selectively sparing normal tissue in patients undergoing treatment with alkylating agents. Possible ramifications to cancer

chemotherapy are discussed. NO:48 AU:Petraakis NL TI:Biologic banking in cohort studies, with special reference to blood. SO:Natl Cancer Inst Monogr. 1985 May. 67P 193-8. AB:Those who conduct cohort studies in cancer epidemiology increasingly use biochemical analyses as an important component. Some of the potentially important considerations when banked blood is used include the conditions and temperature of storage, effects of thawing, and the stability of specific substances under prolonged subfreezing temperatures. I have reviewed a selected number of biochemical substances. NO:49 AU:Roekens E; Deelstra H; Robberecht H TI:Trace Elements In Human Milk, Selenium a case study. SO:Sci Total Environ. 1985 Mar 15. 42(1-2). P 91-108. AB:Longitudinal changes of the trace element (Fe, Cu, Zn, Mn, Mo, Cr, Co, As, Se) composition of human milk are discussed. The mean daily intake of breast fed infants is compared with the intake of infants fed cow's milk and with recommended dietary allowances. Parameters which can be used to check the selenium status are discussed. Clinical consequences of selenium deficiency are discussed. NO:50 AU:Vretlind A TI:[General aspects of parenteral feeding of patients with malignant neoplasms] SO:Vestn Akad Med Nauk SSSR. 1985. (7). P 7-14. NO:51 AU:Segal B; Segal R; Cotrau M TI:[Anticancer Food Factors] SO:Rev Med Chir Soc Med Nat Iasi. 1985 Jan-Mar. 89(1). P 105-8. NO:52 AU:Nordman E TI:[An Oncologist's Point Of View On cancer and miracle medicines] SO:Nord Med. 1985. 100(4). P 120-1. NO:53 AU:Hoffman FA TI:Micro nutrient Requirements Of Cancer Patients. SO:Cancer. 1985 Jan 1. 55(1 SUPPL). P 295-300. AB:Several major factors may influence the micronutrient requirements of the patient with cancer. These factors include the metabolic state of the malignancy and its effects on host metabolism, the catabolic effects of antineoplastic therapy, and other physiologic stresses commonly associated with the treatment of cancer, i.e., surgery, fever and infection. Although the nutritional importance of vitamins, minerals and trace elements is recognized, the optimal daily dose that will preserve lean body mass without enhancing tumor growth, is not known. Recommended Dietary Allowances (RDAs), where established, are based on populations with nonmalignant diseases. However, supplementation with vitamins, minerals, and certain trace elements is recommended for the cancer patient who requires prolonged parenteral support, since clinically relevant deficiency states have been described. The effect of malignancy on the metabolism of several of these micronutrients (iron, ascorbic acid, alpha tocopherol, selenium, zinc, copper) is discussed. NO:54 AU:Fernandes G TI:Nutritional Factors: Modulating Effects On Immune function and aging. SO:Pharmacol Rev. 1984 Jun. 36(2 SUPPL). P 123S-129S. NO:55 AU:Bowman BB; Kushner RF; Dawson SC; Levin B TI:Macrobiotic Diets For Cancer Treatment And prevention. SO:J Clin Oncol. 1984 Jun. 2(6). P 702-11. NO:56 TI:Coal gasification. SO:IARC Monogr Eval Carcinog Risk Chem Hum. 1984 Jun. 34P 65-99. NO:57 TI:Coke production. SO:IARC Monogr Eval Carcinog Risk Chem Hum. 1984 Jun. 34P 101-31. UI NO:58 AU:Sauberlich HE TI:Implications Of Nutritional Status On Human biochemistry, physiology, and health. SO:Clin Biochem. 1984 Apr. 17(2). P 132-42. AB:Optimum nutrition is the level of intake that should promote the highest level of health. Although excess caloric intake will lead to obesity, a deficit in nutrition may result in a tissue depletion of essential nutrients that can lead to biochemical changes and eventually to clinical signs and symptoms. Nutrition requirements may differ according to sex, age, activity, or physiological state and can be influenced by drugs, smoking, alcohol, and other factors. With ever-increasing sedentary life styles and less physically demanding jobs, the resulting reduced caloric requirements have made it more difficult to make nutritionally sound food choices. Nutrition is the single most important component of preventive health care. Diet has been associated with cancer, heart disease, diabetes, stroke and hypertension, arteriosclerosis, and cirrhosis of the liver. The ability of the human to respond to stresses, such as altitude, heat, trauma, surgery, and infection can be influenced by nutritional status. Nutritional status is reflected in a variety of metabolic processes that provide the basis for a number of methods for its assessment. NO:59 AU:Chan M; Elgar M; Trotter JM TI:Role Of Trace Elements In Cancer. SO:Aust Nurses J. 1984 Feb. 13(7). P 5-6. NO:60 AU:McKenna G; Wright M TI:Clinical. 2. Eating Your Defences. SO:Nurs Mirror. 1983 Dec 14. 157(24). P 33-5. NO:61 AU:Arai K; Conley BA; Nemir P Jr TI:Reduction Of Dithizone-reactive Granules Of Blood granulocytes in humans and rats bearing tumor. SO:J Lab Clin Med. 1983 Aug. 102(2). P 286-97. AB:To confirm scattered reports suggesting a significant reduction of dithizone-reactive granules of granulocytes in neoplastic diseases, the peripheral blood of 20 normal adults, 22 patients with non-malignant diseases, and 39 cancer patients were studied by using a modified dithizone staining method and scoring of the stained granules. The dithizone score in the cancer patients was significantly (p less than 0.001) lower than those in the normal controls or the noncancer patients, with mean scores of 226.0 ± 6.3 (S.E.), 277.5 ± 4.7 , and 265.9 ± 5.8 , respectively. When compared with the lower limit (score 233) of the 95% confidence interval of a normal score distribution, 24 (61.5%) of the 39 cancer patients showed abnormally low scores, and one (2.4%) of the 42 individuals without cancer exhibited a low score (p less than 0.001). No relationship was found between the score and the patient's age, total serum protein, serum globulin, serum albumin, albumin/globulin ratio, absolute numbers of neutrophils or lymphocytes, or serum zinc level. In the rats transplanted with syngeneic tumor, the dithizone score progressively declined as the tumor increased in size, with a close negative correlation ($r = -0.81$) in a manner best fitting a power curve. This change was not found in the control rats injected with killed tumor cells. These results indicate that the dithizone-reactive granules of the granulocytes significantly decreased in a tumor-bearing host. The mechanisms are not known and this staining method can not be considered as a diagnostic tool, but this phenomenon appears to have potential usefulness in the systemic effect of solid tumor. NO:62 AU:Drucker H TI:Assessment: an overview. SO:Sci Total Environ. 1983 Jun. 28P 467-78. NO:63 AU:Robson JR TI:Vitamins And Trace Elements In Cancer patients. SO:J Parenter Sci Technol. 1983 May-Jun. 37(3). P 87-8. NO:64 AU:Ronnlund RD; Suskind RM TI:Iron, Zinc, And Other Trace Elements' effect on the immune response. SO:J Pediatr Gastroenterol Nutr. 1983. 2 SUPPL 1(SUPPL 1). P S172-80. NO:65 AU:Dionigi R TI:Immunological Factors In Nutritional Assessment. SO:Proc Nutr Soc. 1982 Sep. 41(3). P 355-71. NO:66 AU:Zumkley H; Bertram HP; Preusser P; Kellinghaus H; Straub C; Vetter H TI:Renal Excretion Of Magnesium And Trace elements during cisplatin treatment. SO:Clin Nephrol. 1982 May. 17(5). P 254-7. AB: Plasma and urine concentrations of platinum, magnesium, zinc and copper were measured in 15 patients treated with cisplatin. The renal excretion rates of platinum, magnesium, zinc and copper were markedly increased. In plasma markedly elevated levels of platinum could be found and were accompanied by decreased concentrations of magnesium, potassium and calcium. The plasma concentrations of zinc and copper showed only slight changes. Our results indicate, that cisplatin may influence renal excretion of some electrolytes and trace elements by a specific factor and/or by alteration in renal function. NO:67 AU:Capel ID; Pinnock MH; Williams DC; Hanham IW TI:The Serum Levels Of Some Trace and bulk elements in cancer patients. SO:Oncology. 1982. 39(1). P 38-41. AB:The levels of copper, zinc, calcium, manganese and magnesium have been monitored in the sera of patients suffering from various types of cancer. Only serum copper appeared to be of any diagnostic significance, its levels being above the normal reported range in the breast cancer, leukaemia and Hodgkin's lymphoma patients. In the case of breast cancer, serum copper is progressively elevated according to the stage of the disease. Serum calcium levels were also significantly lower in patients with tumours of the breast, gastrointestinal tract and cervix. The results suggest that serum copper levels could be of prognostic significance in breast cancer patients receiving radiotherapy. NO:68 AU:Shah SS; Ranade SS; Phadke RS; Kasturi SR TI:Significance Of Water Proton Spin-lattice Relaxation times in normal and malignant tissues and their subcellular fractions--II. SO:Magn Reson Imaging. 1982. 1(3). P 155-64. NO:69 AU:Demetrakopoulos GE; Brennan MF TI:Tumoricidal Potential Of Nutritional Manipulations. SO:Cancer Res. 1982. 42(2 SUPPL). P 756s-765s. AB: Perturbations of specific nutrient availability is the basis of a large number of chemotherapeutic modalities used in cancer treatment. The creation of transient nutrient deprivation states by deficient diets (deficiency), nutrient destruction or displacement (depletion), the presence of antimetabolites or analogs (deficiency state), or combinations of the above has shown significant antitumor effect in several animal and human cancers. Pair-fed isocaloric diets deficient in micronutrients such as carbohydrates (with or without gluconeogenesis inhibition) or micronutrients such as zinc or pyridoxine have demonstrated antitumor potential. Amino acid depletion by enzymes such as L-asparaginase or L-glutaminase has become a popular modality for treatment of human leukemias. Purine and pyrimidine analogs or folate antimetabolites have been used successfully for several decades in the treatment of human tumors. Excess pyridoxine in tissue culture has demonstrated antineoplastic potential. Dietetic supplementation with naturally occurring sugars, sugar derivatives, or analogs has also demonstrated tumorigenic effects. NO:70 AU:Shklar G AD:Department of Oral Medicine and Diagnostic Sciences, Harvard School of Dental Medicine, Boston, MA 02115, USA. TI:Mechanisms Of Cancer Inhibition By Anti-oxidant nutrients. SO:Oral Oncol. 1998 Jan. 34(1). P 24-9. AB:The cancer inhibitory properties of anti-oxidant micronutrients have been well established in experimental animal models and cell culture studies. Human studies have also tended to indicate an inhibition of various forms of cancer and the regression of some precancerous lesions. The biological mechanisms for cancer inhibition and regression are now gradually becoming understood, and the anti-oxidant nutrients appear to act through a number of pathways common to most of the agents studied. These various micronutrients appear to act through a complex group of "common pathways" of anticancer activity based upon three major mechanisms: (1) tumour inhibition by immune cytokines;

(2) stimulation of cancer suppressor genes, such as "wild type" p53, and diminished expression or dysregulation of oncogenes such as mutant p53 and H-ras; (3) inhibition of tumour angiogenesis through the inhibition of angiogenesis-stimulating factors such as TGF alpha. Retinoid action differs, in some respects, from other micronutrient anticancer mechanisms and appears to relate to its stimulation of cellular differentiation and resultant apoptosis of neoplastic cells. Combinations of anti-oxidant nutrients have been shown to be synergistic in their anticancer activity, probably due to their optimal anticancer activity at different oxygen potentials. Selectivity in the action on cancer cells, as opposed to normal cells, is a major feature of the anti-oxidant micronutrients. NO:71 AU:Gey KF AD:Department of Biochemistry and Molecular Biology, University of Berne, Switzerland. TI:Vitamins E Plus C And Interacting micronutrients required for optimal health. A critical and constructive review of epidemiology and supplementation data regarding cardiovascular disease and cancer. SO:Biofactors. 1998. 7(1-2). P 113-74. AB:Antioxidants are crucial components of fruit/vegetable rich diets preventing cardiovascular disease (CVD) and cancer: plasma vitamins C, E, carotenoids from diet correlate prevalence of CVD and cancer inversely, low levels predict an increased risk of individuals which is potentiated by combined inadequacy (e.g., vitamins C + E, C + carotene, A + carotene); self-prescribed rectification of vitamins C and E at adequacy of other micronutrients reduce forthcoming CVD, of vitamins A, C, E, carotene and nutrients also cancer; randomized exclusive supplementation of beta-carotene +/- vitamin A or E lack benefits except prostate cancer reduction by vitamin E, and overall cancer reduction by selenium; randomized intervention with synchronous rectification of vitamins A + C + E + B + minerals reduces CVD and counteracts precancerous lesions; high vitamin E supplements reveal potentials in secondary CVD prevention. Plasma values desirable for primary prevention: > or = 30 mumol/l lipid-standardized vitamin E (alpha-tocopherol/cholesterol > or = 5.0 mumol/mmol); > or = 50 mumol/l vitamin C aiming at vitamin C/vitamin E ratio > 1.3-1.5; > or = 0.4 mumol/l beta- (> or = 0.5 mumol/l alpha+ beta-) carotene. CONCLUSIONS: In CVD vitamin E acts as first risk discriminator, vitamin C as second one; optimal health requires synchronously optimized vitamins C + E, A, carotenoids and vegetable nutrients. NO:72 TI: Micronutrients And Human Cancer Risks--prospects For prevention. Joint International Symposium of the Danish Cancer Society, European Cancer Prevention Organization and National Food Agency of Denmark. Aarhus, Denmark, 21-24 May 1997. Abstracts. SO: Eur J Cancer Prev. 1997 Oct. 6(5). P 479-500. NO:73 AU: Malvy DJ; Arnaud J; Burtschy B; Sommelet D; Leverger G; Dostalova L; Amedee-Manesme O AD: INSERM U056, Hospital Center of Bicetre, France. TI: Antioxidant Micronutrients And Childhood Malignancy During oncological treatment. SO: Med Pediatr Oncol. 1997 Sep. 29(3). P 213-7. AB: Serum antioxidant vitamins A (retinol) and E (alpha-tocopherol), beta-carotene, zinc, and selenium, and cholesterol and related proteins for 170 children with newly diagnosed malignancy were measured at diagnosis and 6 months after initiation of treatment, and compared with those of 632 cancer-free controls. Incident cancer cases and controls were 1-16 years old and recruited between 1986 and 1989. At diagnosis, age- and sex-adjusted serum concentrations of retinol, beta-carotene, zinc, and alpha-tocopherol were significantly inversely associated with cancer. No significant decreases in mean values were observed at 6 months, except for the alpha-tocopherol-to-cholesterol ratio in patients with bone tumors and serum zinc in bone tumors and central nervous system malignancies. An increase during the period of treatment was found for retinol and selenium in leukemia patients. beta-carotene was maintained at the initial concentrations determined prior to therapy. These findings provide further information about micronutrient requirements in children with cancer. NO:74 AU: Buiatti E AD: Centro di Documentazione per la Salute (CDS), Bologna, Italy. TI: The Role Of Chemoprevention In Cancer control. SO: Salud Publica Mex. 1997 Jul-Aug. 39(4). P 310-7. AB: Chemoprevention can be defined as the use of chemical compounds or medicines to prevent the occurrence of precancerous lesions (markers) or to slow down or revert the progression of clinically established disease. The use of randomized trial design is considered the gold standard for evaluating the preventive value of chemicals against cancer, since they control for confounding and avoid information bias. The principal school in relation to cancer control through chemoprevention is based on studies of cancer and diet. Initially, ecological studies set the cornerstone, but later case-control studies supported the hypothesis of an inverse association between foods and cancer risk (principally epithelial), suggesting that determined micronutrients participate as protection in this process. Other studies include specific chemical analyses, which have potential problems that could lead to erroneous conclusions, such as sample and measurement errors. During this decade randomized intervention trials have been carried out to test this hypothesis, but conclusions have been so diverse and the designs used have been so different in terms of levels of exposure, that consistent conclusions are not possible. We can conclude that using studies with randomized, double-blind, controlled designs is interesting, but problems remain to be solved, including: agent selection, the design to be chosen, and especially the balance between benefits sought and secondary effects, including cost-effectiveness, since some chemicals cannot compete with other preventive or therapeutic measures. NO:75 AU: Favero A; Salvini S; Russo A; Parpinel M; Negri E; Decarli A; La Vecchia C; Giacosa A; Franceschi S AD: Servizio di Epidemiologia, Centro di Riferimento Oncologico, Aviano, Italy. TI: Sources Of Macro- And Micronutrients In Italian women: results from a food frequency questionnaire for cancer studies. SO: Eur J Cancer Prev. 1997 Jun. 6(3). P 277-87. AB: The knowledge of major sources of macro- and micronutrients is essential in order to interpret differences in the diet-cancer link in various geographical areas and to provide better nutritional guidelines. For this purpose we took advantage of the control group of a case-control study on breast cancer carried out in six Italian areas. The dietary habits of 2,588 cancer-free women aged 20-74 years (median age 56) were elicited between 1991 and 1994 by means of an interviewer-administered food frequency questionnaire (FFQ) that included 78 foods or food groups, in addition to several questions on general dietary pattern (e.g., fat in seasoning). Bread was the first contributor for total energy (12%), protein (8%) and starch (32%) intake, whereas, for saturated fatty acid, the first sources were different types of cheese (28%); for monounsaturated fatty acids the dressing oils of salad and tomatoes (12%); and, for sugars, apples and pears (19%). Raw vegetables and fresh fruit represented the most important source of most vitamins. The first contributors of vitamin C and beta-carotene were citrus fruits (29%) and raw carrots (17%), respectively. Thus, between 40 and 80% of specific macronutrient intake and up to 90% intake of several micronutrients were derived from the first ten foods or food groups. Often, the major contributors to the intake of a specific component were foods with a relatively low content, but eaten in large quantities. This work further highlights the specificity of nutrient sources in southern European populations. NO:76 AU: Neeman M; Abramovitch R; Schiffenbauer YS; Tempel C AD: Department of Biological Regulation, Weizmann Institute of Science, Rehovot, Israel. TI: Regulation Of Angiogenesis By Hypoxic Stress: from solid tumours to the ovarian follicle. SO: Int J Exp Pathol. 1997 Apr. 78(2). P 57-70. AB: The preovulatory follicle provides a unique physiological example of rapid growth accompanied by neovascularization, two processes that are generally characteristic of pathologies such as wound repair or malignancy. During the hours preceding ovulation, follicular growth is accompanied by elevated levels of messenger RNA for vascular endothelial growth factor (VEGF). Angiogenic activity, mediated by VEGF, is manifested in the peripheral blood vessels surrounding the follicle, that show capillary sprouting and increased vascular permeability. Following ovulation, rapid infiltration of capillaries through the follicular wall is essential for the formation of the corpus luteum. In this review we compare the preovulatory follicle with a popular model of avascular solid tumour growth, namely the multicellular tumour spheroid, in particular the role of hypoxic stress in the regulation of angiogenesis in both systems. NO:77 AU: Ferguson LR AD: Cancer Research Laboratory, Faculty of Medicine and Health Sciences, University of Auckland, New Zealand. TI: Micronutrients, Dietary Questionnaires And Cancer. SO: Biomed Pharmacother. 1997. 51(8). P 337-44. AB: There is increasing evidence that many chemicals, although present in the diet at only low levels, play an important role in protection against cancer. Micronutrients are defined as nutrients present in the body in amounts less than 0.005% of body weight. Some micronutrients suggested to play a protective role in cancer are beta-carotene, vitamin E and vitamin C. In addition to those chemicals with an established role in nutrition, there is also a less well-defined group of chemicals, often referred to as phytochemicals, which may prove even more important. Examples here are a group of sulphur-containing chemicals present in brassicaceous vegetables, such as broccoli and cabbage, that appear to be very effective anticarcinogens. Epidemiology will be essential in accurately defining the role of phytochemicals and micronutrients in cancer. However, the large prospective studies that would be most desirable increasingly utilize food frequency questionnaires containing a limited number of questions. Such an approach has been well validated for macronutrients. However, there is often less accurate information available on micronutrients and phytochemicals, and the food combinations necessary (and acceptable) for macronutrients may be inappropriate for these other factors. It would be most desirable that fruits and vegetables are individually itemized or grouped according to plant families rather than macronutrient status. This may be the most appropriate way of identifying potentially novel protective factors in the diets of countries such as Morocco or New Zealand. NO:78 AU: Reddy BS AD: Division of Nutritional Carcinogenesis, American Health Foundation, Valhalla, New York, USA. TI: Micronutrients as chemopreventive agents. SO: IARC Sci Publ. 1996. (139). P 221-35. AB: The concept of chemoprevention of cancer by micronutrients is based upon evidence from human

epidemiology and from studies of animal carcinogenesis models for cancer-inhibiting potential of certain minerals and vitamins. These micronutrients are diverse with respect to chemical structures and physiological effects, and include calcium, selenium, carotenoids, and vitamins A, C, D and E. The dietary intake of various micronutrients has been observed to alter significantly the incidence and mortality of a variety of human cancers including those of the oesophagus, stomach, colon, breast and cervix. Studies of laboratory animal models have also provided relevant mechanistic and efficacy data on the role of specific micronutrients as well as minor non-nutrients of dietary origin in the carcinogenic process. Micronutrients and such minor non-nutrients have been found to modulate the formation and bioactivation of carcinogens, modify the promotion and progression of carcinogenesis, alter cellular and host defences, and affect cellular differentiation-ultimately leading to variations in tumour incidences. Our understanding of biochemical and biological mechanisms of carcinogenesis and of inhibition of initiation, promotion and progression by particular micronutrients-both naturally occurring forms and their synthetic analogues-has made it possible to develop strategies for clinical intervention by these agents. It is possible that intervention with individual micronutrients and minor non-nutrients, and/or with a combination of such compounds with different modes of action, will prevent, delay or reverse the process of carcinogenesis and thus reduce the incidence of and mortality due to human cancers. A number of Phase II clinical trials have been initiated with the objective of identifying and evaluating intermediate biomarkers that will be used as surrogate end points for cancer. Several surrogate end points have been standardized and validated for their specificity. The results are very encouraging. NO:79 AU:Riboli E; Slimani N; Kaaks R AD:Unit of Nutrition and Cancer, International Agency for Research on Cancer, Lyon, France. TI:Identifiability of food components for cancer chemoprevention. SO:IARC Sci Publ. 1996. (139). P 23-31. AB:Epidemiological studies have consistently reported a reduction in risk for several cancer sites in relation to high consumption of vegetables and fruit. These findings stimulated further research aimed at identifying which compounds in fruit and vegetables are responsible for the reduction in cancer risk. Epidemiological and laboratory studies suggested that some micronutrients, particularly vitamin C, vitamin E, beta-carotene, selenium, magnesium and zinc, could reduce the risk of cancers of the oral cavity, lung, oesophagus and stomach, while dietary fibre was more specifically related to a reduced risk of colorectal cancer. However, the results of large randomized trials on various combinations of vitamins and minerals at supranutritional doses have so far failed to confirm this hypothesis or have found very weak effects. These results should stimulate profound re-thinking of the methods that led to the selection of specific molecules with potential chemopreventive action. From a methodological point of view, little attention has so far been given to four main limitations of nutritional epidemiology, which have direct bearing on the extrapolation of results from foods to food components. Measurements of micronutrient intakes through simple dietary questionnaires and current food composition tables lack precision and specificity. Micronutrient intakes are often highly correlated in nature because micronutrients tend to share the same food sources. Attribution of cancer risk to a single food constituent can be misleading if multicollinearity of dietary variables is not recognized. The etiological meaning of nutritional biomarkers is not straightforward because circulating levels of nutrients reflect not only dietary intake but also complex metabolic regulations. Studies have not considered the physical characteristics of foods, which are important determinants of physiological responses. Understanding the multidimensional nature of diet and of its relationship with different cancers is a major scientific challenge. Epidemiological studies combining detailed dietary questionnaires, appropriate food composition tables, multiple biomarkers, and appropriate statistical methods may provide better measurements of the relationships between cancer risk and specific dietary patterns and therefore contribute to the identification of food components with hitherto unforeseen potential interest for cancer prevention.

Available data suggest that vitamin D deficiency may be widespread globally⁸. Bodies make vitamin D from sunlight, but this varies based on geography, skin color, air pollution, and other factors. Also, sunlight exposure needs to be limited to avoid risk of skin cancer. Read Moreexternal icon. Iodine. Iodine is required during pregnancy and infancy for the infant's healthy growth and cognitive development⁹. Globally an estimated 1.8 billion people have insufficient iodine intake. Iodine content in most foods and beverages is low. Fortifying salt with iodine is a successful intervention – about 86% of households worldwide consume iodized salt¹⁰. Translations in context of "micronutrientes" in Spanish-English from Reverso Context: Las carencias de micronutrientes son también generalizadas. Esto ayuda a asegurar que los macro y micronutrientes de los elementos de su dieta se absorbe correctamente. This helps ensure the macro and micronutrient elements of your diet get absorbed properly. Además, los suplementos de micronutrientes podrán ayudar a las personas que viven con VIH/SIDA. In: Ferreira, M.E., Cruz, M.C.P., Raij, B.V. and Abreu, C.A., Eds., *Micronutrientes e Elementos Tóxicos na Agricultura*, POTAFOS/CNPq/FAPESP, Jaboticabal, 13-41. has been cited by the following article: TITLE: Nutrient Accumulation in *Amaryllis*. AUTHORS: Caroline de Moura D'Andréa Mateus, Kathia Fernandes Lopes Pivetta, Roberto Lyra Villas Boas, Regina Maria Monteiro de Castilho, Maria Márcia Pereira Sartori, Renata Bachin Mazzini-Guedes. KEYWORDS: Plant Nutrition, Ornamental Geophytes, *Hippeastrum* hybrid. JOURNAL NAME: American Journal of Plant Sciences, Vol.9 No.2, January 26, 2018. ABSTRACT: *Amaryllis* plants (*Hippeastrum* hybrid, in the family Amaryllidaceae) are cultivated in Brazil mainly for bulb export. 3-Essencialidade Macro e Micronutrientes. Uploaded by: Leonardo Moreira. Description: macro e micronutrientes. Copyright: © All Rights Reserved. A presença não garante a essencialidade. A planta apresenta certa seletividade, mas absorve quase todos os elementos encontrados no solo. 1.1 Critérios de essencialidade. a) Critério direto: O elemento faz parte de um composto ou reage sem o qual ou a qual, a planta não completa seu ciclo de vida. - O elemento não pode ser substituído por outro. b) Critério indireto: na ausência do elemento a planta não completa seu ciclo de vida. - O efeito deve ser observado na planta. Nutrientes essenciais Vs Nutrientes. 2 Nutrientes, elementos benéficos e elementos tóxicos. Orgânicos: C, H, O. MACRONUTRIENTES.