HOME
ARTICLES
ABOUT RAY PEAT
ART GALLERY
LINKS

Loading

ARTICLE

Milk in context: allergies, ecology, and some myths

Food allergies are becoming much more common in recent decades, especially in industrialized countries. Most attention has been given to theories about changes in people, such as the reduction in infectious diseases and parasites, or vitamin D deficiency, or harmful effects from vaccinations, and little attention has been given to degradation of the food supply.

Our food cultures, like linguistic and moral cultures, give us some assumptions or theories about the way the world should be, and if these beliefs aren't questioned and tested, they can permeate the culture of science, turning the research process into a rationalization of accepted opinions.

In general, those who pay for research are those with an investment in or commitment to the preservation and expansion of the existing systems of production and distribution. Cheap mass production, durability and long shelf-life are more important than the effects of foods on health. The biggest industries are usually able to keep public attention away from the harm they do.

The historical economic importance of cereals and beans is reflected in the nutritional and biochemical research literature, which has paid relatively little attention to basic questions about human adaptation to the ecosystems. From the early petrochemical “Green Revolution” to the contemporary imposition of genetically altered seeds, the accumulated economic power of the food industry has taken control of the food culture.

In evaluating each research publication relating to nutrition and health, we should ask what alternative possibilities are being neglected, for “practical” reasons, cultural preferences, and business interests.

Some people with an ecological concern have argued that grains and beans can most economically provide the proteins and calories that people need, but good nutrition involves much more than the essential nutrients.

“Efficient” industrial agriculture has been concerned with cheaply producing those important nutrients, and their critics have focussed on their use of toxic chemicals, on the social damage they produce, the degradation of the soil, the toxic effects of genetic modification, their unsustainable use of petroleum, and occasionally on the lower nutritional value of chemically stimulated crops.

I think far too little attention is being given to the effects of abnormal and stressful growth conditions on the plants' natural defense systems. Plants normally synthesize some toxins and inhibitors of digestive enzymes to discourage attacks by bacteria, fungi, insects, and other predators. When a plant is injured or otherwise stressed, it produces more of the defensive substances, and very often they communicate their stress to other plants, and the resulting physiological changes can cause changes in seeds that affect the resistance of the progeny. (Agrawal, 2001)

One of many substances produced by plants in response to injury is chitinase, an enzyme that breaks down chitin, a polysaccharide that is a structural component of fungi and insects. Chitinase, which is produced by bacteria and humans, as well as by plants and other organisms, is involved in developmental processes as well as in the innate immune system. In plants, the enzyme is induced by ethylene and salicylate, in animals by estrogen, light damage, and infections, and can be demonstrated in polyps and cancers.

The two main classes of plant allergens are the stress-induced chitinases, and seed storage proteins, such as gluten. The chitinase allergens are responsible for reactions to latex (which is secreted by rubber trees in reaction to a wound), bananas, avocados, many other fruits and vegetables, and some types of wood and other plant materials. Intensive agricultural methods are increasing the formation of the defensive chemicals, and the industrialized crops are responsible for the great majority of the new allergies that have appeared in the last 30 years.

The presence of the chitinase family of proteins in humans was first discovered in the inflamed asthmatic lung. It was then found at high levels in the uterine endometrium at the time of implantation of the embryo (an inflammation-like situation) and in the uterus during premature labor. Since estrogen treatment is known to increase the incidence of asthma and other inflammations, the appearance of chitinase also in the uterus in estrogen dominated conditions is interesting, especially when the role of estrogen in celiac disease (in effect an allergy to gluten) is considered. Celiac disease is more prevalent among females, and it involves the immunological cross-reaction to an antigen in the estrogen-regulated transglutaminase enzyme and the gluten protein. The (calcium-regulated) transglutaminase enzyme is involved in the cross-linking of proteins in keratinized cells, in fibrotic processes in the liver, and in cancer. (People with celiac disease often suffer from osteoporosis and urinary stone deposition, showing a general problem with calcium regulation.)

This means that estrogen and stress cause the appearance of antigens in the human or animal tissues that are essentially the same as the stress-induced and defensive proteins in plant tissues. A crocodile might experience the same sort of allergic reaction when eating estrogen-treated women and when eating commercial bananas.

The various states of the innate immune system have been neglected by immunologists, for example in relation to organ transplantation. The “major histocompatibility” antigens are matched, but organ transplants still sometimes fail. A study found that the livers from young men had a high survival rate when transplanted into either men or women, but the livers of older women donors were rejected at a high rate when transplanted into either men or women. Exposure to estrogen increases intracellular calcium and the unsaturation of fatty acids in tissue lipids, and the expression of enzymes such as chitinase and transglutaminase, and the various enzymes in the structure-sensitive estrogen-controlled metabolic pathways.

Estrogen's actions are closely and pervasively involved with the regulation of calcium, and these changes affect the basic tissue structures and processes that constitute the innate immune system. Estrogen's effect in increasing susceptibility to “autoimmune” diseases hasn't yet been recognized by mainstream medicine.

The chemist Norman Pirie argued convincingly that leaf protein had much higher nutritional value than grain and bean proteins, and that it had the potential to be much more efficient economically, if it could be separated from the less desirable components of leaves.

The amino acid composition and nutritional value of leaf protein is similar to milk protein, which is understandable since cows produce milk from the amino acids produced in their rumens by bacteria digesting the leaves the cows have eaten. The bacteria perform the refining processes that Pirie believed could be done technologically, and they also degrade or detoxify the major toxins and allergens.

The nutrients produced in the cow's rumen are selectively absorbed into the cow's bloodstream, where the liver can further filter out any toxins before the amino acids and other nutrients are absorbed by the udder to be synthesized into milk. If cows are fed extremely bad diets, for example with a very large amount of grain, the filtering process is less perfect, and some allergens can reach the milk, but since sick cows are less profitable than healthy cows, dairies usually feed their cows fairly well.

In a recent study of 69,796 hospitalized newborns, a diagnosis of cow's milk allergy was made in 0.21% of them. Among those whose birthweight had been less than a kilogram, 0.35% of them were diagnosed with the milk allergy. Gastrointestinal symptoms were the main reason for the diagnosis, but a challenge test to confirm the diagnosis was used in only 15% of the participating hospitals, and a lymphocyte stimulation test was used in only 5.5% of them (Miyazawa, et al., 2009). There are many publications about milk allergies, but they generally involve a small group of patients, and the tests they use are rarely evaluated on healthy control subjects.

Several surveys have found that of children who have a diagnosed milk allergy, about 2/3 of them grow out of the allergy.

People who have told me that they have had digestive problems with milk have sometimes found that a different brand of milk doesn't cause any problem.

Milk with reduced fat content is required by US law to have vitamins D and A added. The vehicle used in the vitamin preparation, and the industrial contaminants in the “pure” vitamins themselves, are possible sources of allergens in commercial milk, so whole milk is the most likely to be free of allergens.

A thickening agent commonly used in milk products, carrageenan, is a powerful allergen that can cause a “pseudo-latex allergy” (Tarlo, et al., 1995). It is a sulfated polysaccharide, structurally similar to heparin. There are good reasons to think that its toxic effects are the result of disturbance of calcium metabolism (see for example Abdullahi, et al., 1975; Halici, et al., 2008; Janaswamy and Chandrasekaran, 2008).

Besides the idea of milk allergy, the most common reason for avoiding milk is the belief that the genes of some ethnic groups cause them to lack the enzyme, lactase, needed to digest milk sugar, lactose, and that this causes lactose intolerance, resulting in gas or diarrhea when milk is consumed. Tests have been reported in which a glass of milk will cause the lactase deficient people to have abdominal pain. However, when intolerant people have been tested, using milk without lactose for comparison, there were no differences between those receiving milk with lactose or without it. The “intolerant” people consistently tolerate having a glass with each meal.

When a group of lactase deficient people have been given some milk every day for a few weeks, they have adapted, for example with tests showing that much less hydrogen gas was produced from lactose by intestinal bacteria after they had adapted (Pribila, et al., 2000).

Bacterial overgrowth in the small intestine can be caused by hypothyroidism (Lauritano, et al., 2007), and the substances produced by these bacteria can damage the lining of the small intestine, causing the loss of lactase enzymes (Walshe, et al., 1990).

Another hormonal condition that probably contributes to lactase deficiency is progesterone deficiency, since a synthetic progestin has been found to increase the enzyme (Nagpaul, et al., 1990). The particular progestin they used lacks many of progesterone's effects, but it does protect against some kinds of stress, including high estrogen and cortisol. This suggests that stress, with its increased ratio of estrogen and cortisol to progesterone, might commonly cause the enzyme to decrease.

Two other ideas that sometimes cause people to avoid drinking milk and eating cheese are that they are “fattening foods,” and that the high calcium content could contribute to hardening of the arteries.

When I traveled around Europe in 1968, I noticed that milk and cheese were hard to find in the Slavic countries, and that many people were fat. When I crossed from Russia into Finland, I noticed there were many stores selling a variety of cheeses, and the people were generally slender. When I lived in Mexico in the 1960s, good milk was hard to find in the cities and towns, and most women had fat hips and short legs. Twenty years later, when good milk was available in all the cites, there were many more slender women, and the young people on average had much longer legs. The changes I noticed there reminded me of the differences I had seen between Moscow and Helsinki, and I suspect that the differences in calcium intake were partly responsible for the changes of physique.

In recent years there have been studies showing that regular milk drinkers are less fat than people who don't drink it. Although the high quality protein and saturated fat undoubtedly contribute to milk's anti-obesity effect, the high calcium content is probably the main factor.

The parathyroid hormone (PTH) is an important regulator of calcium metabolism. If dietary calcium isn't sufficient, causing blood calcium to decrease, the PTH increases, and removes calcium from bones to maintain a normal amount in the blood. PTH has many other effects, contributing to inflammation, calcification of soft tissues, and decreased respiratory energy production.

When there is adequate calcium, vitamin D, and magnesium in the diet, PTH is kept to a minimum. When PTH is kept low, cells increase their formation of the uncoupling proteins, that cause mitochondria to use energy at a higher rate, and this is associated with decreased activity of the fatty acid synthase enzymes.

These changes are clearly related to the anti-obesity effect of calcium, but those enzymes are important for many other problems.

The “metabolic syndrome,” that involves diabetes, hypertension, and obesity, is associated with high PTH (Ahlström, et al., 2009; Hjelmesaeth, et al., 2009).

Alzheimer's disease involves decreased mitochondrial activity and low levels of the uncoupling proteins. There is evidence that milk drinkers are protected against dementia (Yamada, et al., 2003). Cancer involves increased activity of the fatty acid synthase enzymes. Increased calcium consumption beneficially affects both sets of enzymes, uncoupling proteins and fatty acid synthase.

Multiple sclerosis relapses consistently occur at times of high PTH, and remissions consistently occur at times of low PTH (Soilu-Hänninen, et al., 3008). PTH increases the activity of nitric oxide synthase, and nitric oxide is a factor in the vascular leakiness that is so important in MS.

There are components of milk that might protect against tooth decay by inhibiting the binding of bacteria to teeth (Danielsson, et al., 2009).

David McCarron has published a large amount of evidence showing how calcium deficiency contributes to high blood pressure. The chronic elevation of PTH caused by calcium deficiency causes the heart and blood vessels to retain calcium, making them unable to relax fully.

Intravenous infusion of calcium can relax blood vessels and improve heart function. The suppression of PTH is probably the main mechanism.

PTH (like estrogen) causes mast cells to release promoters of inflammation, including histamine and serotonin. Serotonin and nitric oxide contribute to increasing PTH secretion.

Removal of the parathyroid gland has reduced heart problems and mortality (Costa-Hong, et al., 2007) and insomnia (Esposito, et al., 2008; Sabbatini, et al., 2002) in people with kidney disease and excess PTH.

Increased carbon dioxide, for example when adapted to high altitude, can greatly decrease PTH. Frequent, but smaller, meals can reduce PTH.

Cancer cells often secrete PTH and related proteins with similar effects on calcium, and the PTH stimulates the growth and invasiveness of prostate cancer (DaSilva, et al., 2009) cells, and seems to be as closely involved with breast cancer. The PTH-related protein is associated with calcification in breast cancer (Kanbara, et al., 1994). Microscopic calcium crystals themselve produce inflammation (Denko and Whitehouse, 1976).

Besides being an ecologically favorable source of calcium, protein, sugar, and fat, the composition of milk causes it to be digested efficiently, supporting the growth of bacteria that are relatively safe for the intestine and liver, and reducing the absorption of endotoxin.

Dividing any food into smaller meals can lower the PTH, and milk is a convenient food to use in small amounts and frequently.

Some amino acids directly stimulate insulin secretion, decreasing blood sugar and leading to the secretion of cortisol in reaction to the depression of blood glucose. The presence of lactose in milk, and of fat, to slow absorption of the amino acids, helps to minimize the secretion of cortisol. The main protein of milk, casein, seems to have some direct antistress effects (Biswas, et al., 2003).

Since milk's primary biological function is to support the growth of a young animal, some of its features make it inappropriate as a sole food for an adult. To support cell division and growth, the methionine and tryptophan content of milk is higher than would be optimal for an adult animal, and the phosphate might be slightly more than needed, in relation to the calcium. Since the fetus stores a large amount of iron during gestation, the iron content of milk is low, and when a young animal has used the stored iron, its continuing growth requires more iron than milk provides. However, for an adult, the low iron content of milk and cheese makes these foods useful for preventing the iron overload that often contributes to the degenerative diseases.

Combining milk and cheese with fruits adds to the antistress effect. The additional sugar and potassium and other minerals allow the milk protein to be used more efficiently, by moderating the secretion of cortisol, and helping to inhibit the secretion of PTH.

Substances such as PTH, nitric oxide, serotonin, cortisol, aldosterone, estrogen, thyroid stimulating hormone, and prolactin have regulatory and adaptive functions that are essential, but that ideally should act only intermittently, producing changes that are needed momentarily. When the environment is too stressful, or when nutrition isn't adequate, the organism may be unable to mobilize the opposing and complementary substances to stop their actions. In those situations, it can be therapeutic to use some of the nutrients as supplements. Calcium carbonate (eggshell or oyster shell, for example) and vitamins D and K, can sometimes produce quick antistress effects, alleviating insomnia, hypertension, edema, inflammations and allergies, etc., but the regular use of milk and cheese can prevent many chronic stress-related diseases.

REFERENCES

Agents Actions. 1975 Oct;5(4):371-3. **Effect of calcitonin on carrageenan foot oedema.** Abdullahi SE, De Bastiani G, Nogarin L, Velo GP.

Am Nat. 2001 May;157(5):555-69. **Transgenerational consequences of plant responses to herbivory: an adaptive maternal effect?** Agrawal AA.

Clin Endocrinol (Oxf). 2009 Nov;71(5):673-8. **Correlation between plasma calcium, parathyroid hormone (PTH) and the metabolic syndrome (MetS) in a community-based cohort of men and women.** Ahlström T, Hagström E, Larsson A, Rudberg C, Lind L, Hellman P.

Indian J Exp Biol. 2003 Apr;41(4):367-9. **Protection of adrenocortical activity by dietary casein in ether anaesthetized rats.** Biswas NM, Chattopadhyay A, Sarkar M. “Ether anaesthesia to 20% casein fed rats caused no change in adrenal delta5-3beta-HSD activity and serum corticosterone level when compared with controls fed 20% casein diet. **The results suggest that high milk protein diet may prevent acute stress effects by protecting adrenocortical activity.** The present investigation opens up a new area of management of stress.”

Am J Clin Nutr. 2008 Oct;88(4):877-85. **Dairy calcium supplementation in overweight or obese persons: its effect on markers of fat metabolism.** Bortolotti M, Rudelle S, Schneiter P, Vidal H, Loizon E, Tappy L, Acheson KJ.

J Am Coll Nutr. 2005 Dec;24(6 Suppl):569S-73S. **The myth of increased lactose intolerance in African-Americans.** Byers KG, Savaiano DA.

Exp Eye Res. 2004 Aug;79(2):239-47. **Light damage induced changes in mouse retinal gene expression.** Chen L, Wu W, Dentchev T, Zeng Y, Wang J, Tsui I, Tobias JW, Bennett J, Baldwin D, Dunaief JL.

J Urol. 2008 Sep;180(3):974-9. Epub 2008 Jul 17.**Urinary stone disease in adults with celiac disease: prevalence, incidence and urinary determinants.** Ciacci C, Spagnuolo G, Tortora R, Bucci C, Franzese D, Zingone F, Cirillo M.

Surgery. 2007 Nov;142(5):699-703. **Parathyroidectomy reduces cardiovascular events and mortality in renal Hyperparathyroidism.** Costa-Hong V, Jorgetti V, Gowdak LH, Moyses RM, Krieger EM, De Lima JJ.

Caries Res. 2009;43(3):171-8. **Human milk compounds inhibiting adhesion of mutans streptococci to host ligand-coated hydroxyapatite in vitro.** Danielsson Niemi L, Hernell O, Johansson I.

Cancer Res. 2009 Sep 15;69(18):7402-11. **The neuroendocrine-derived peptide parathyroid hormone-related protein promotes prostate cancer cell growth by stabilizing the androgen receptor.** DaSilva J, Gioeli D, Weber MJ, Parsons SJ.

J Rheumatol. 1976 Mar;3(1):54-62. **Experimental inflammation induced by naturally occurring microcrystalline calcium salts.** Denko CW, Whitehouse MW.

Dig Liver Dis. 2009 Aug;41(8):541-50. **Transglutaminases in inflammation and fibrosis of the gastrointestinal tract and the liver.** Elli L, Bergamini CM, Bardella MT, Schuppan D.

J Nephrol. 2008 Mar-Apr;21 Suppl 13:S92-6. **Parathyroidectomy improves the quality of sleep in maintenance hemodialysis patients with severe hyperparathyroidism.** Esposito MG, Cesare CM, De Santo RM, Cice G, Perna AF, Violetti E, Conzo G, Bilancio G, Celsi S, Annunziata F, Iannelli S, De Santo NG, Cirillo M, Livrea A.

Endocrinology. 1997 Jul;138(7):2665-73. **Parathyroid hormone-related protein is induced in the adult liver during endotoxemia and stimulates the hepatic acute phase response.** Funk JL, Moser AH, Grunfeld C, Feingold KR.

Arch Pharm Res. 2008 Jul;31(7):891-9. **Effects of calcium channel blockers on hyaluronidase-induced capillary vascular permeability.** Halici Z, Suleyman H, Cadirci E.

J Am Diet Assoc. 2000 May;100(5):524-8. **Improved lactose digestion and intolerance among African-American adolescent girls fed a dairy-rich diet.** Pribila BA, Hertzler SR, Martin BR, Weaver CM, Savaiano DA.

Dig Dis Sci. 1998 Jan;43(1):39-40. **Fecal hydrogen production and consumption measurements. Response to daily lactose ingestion by lactose maldigesters.** Hertzler SR, Savaiano DA, Levitt MD.

J Am Coll Nutr. 2009 Apr;28(2):142-9. **Effects of dairy products on intracellular calcium and blood pressure in adults with essential hypertension.** Hilpert KF, West SG, Bagshaw DM, Fishell V, Barnhart L, Lefevre M, Most MM, Zemel MB, Chow M, Hinderliter AL, Kris-Etherton PM. “Consumption of dairy foods beneficially affects (Ca)(i), resulting in improved BP in a subgroup defined by (Ca)(i) response.”

Cardiovasc Diabetol. 2009 Feb 3;8:7. **Parathyroid hormone, but not vitamin D, is associated with the metabolic syndrome in morbidly obese women and men: a cross-sectional study.** Hjelmesaeth J, Hofsø D, Aasheim ET, Jenssen T, Moan J, Hager H, Røislien J, Bollerslev J.

Eur J Epidemiol. 2003;18(7):677-84. **The Swedish coeliac disease epidemic with a prevailing twofold higher risk in girls compared to boys may reflect gender specific risk factors.** Ivarsson A, Persson LA, Nyström L, Hernell O.

Carbohydr Res. 2008 Feb 4;343(2):364-73. Epub 2007 Oct 30. **Heterogeneity in iota-carrageenan molecular structure: insights for polymorph II-->III transition in the presence of calcium ions.** Janaswamy S, Chandrasekaran R.

Metabolism. 2002 Oct;51(10):1230-4. **A calcium-deficient diet caused decreased bone mineral density and secondary elevation of estrogen in aged male rats-effect of menatetrenone and elcatonin.** Kato S, Mano T, Kobayashi T, Yamazaki N, Himeno Y, Yamamoto K, Itoh M, Harada N, Nagasaka A.

Nippon Geka Gakkai Zasshi. 1993 Apr;94(4):394-9. **[Immunohistological evaluation of parathyroid hormone-related protein in breast cancer with and without calcification on mammography]** Kanbara Y, Kono N, Nakaya M, Ishikawa Y, Fujiwara O, Kitazawa R, Kitazawa S.

J Pak Med Assoc. 1996 Jun;46(6):128-31. **Changes in plasma electrolytes during acclimatization at high altitude.** Khan DA, Aslam M, Khan ZU.

J Am Coll Nutr. 2009 Feb;28 Suppl 1:103S-19S. **Milk products, dietary patterns and blood pressure management.** Kris-Etherton PM, Grieger JA, Hilpert KF, West SG.

Br J Cancer. 1996 Jul;74(2):200-7. **A new human breast cancer cell line, KPL-3C, secretes parathyroid hormone-related protein and produces tumours associated with microcalcifications in nude mice.** Kurebayashi J, Kurosumi M, Sonoo H.

J Clin Endocrinol Metab. 2007 Nov;92(11):4180-4. **Association between hypothyroidism and small intestinal bacterial overgrowth.** Lauritano EC, Bilotta AL, Gabrielli M, Scarpellini E, Lupascu A, Laginestra A, Novi M, Sottili S, Serricchio M, Cammarota G, Gasbarrini G, Pontecorvi A, Gasbarrini A.

Bone. 2009 Oct 6. **Bone involvement in clusters of autoimmune diseases: Just a complication?** Lombardi F, Franzese A, Iafusco D, Del Puente A, Esposito A, Prisco F, Troncone R, Valerio G.

Hypertension 1980 Mar-Apr;2(2):162-8. **Enhanced parathyroid function in essential hypertension: a homeostatic response to a urinary calcium leak.** McCarron DA, Pingree PA, Rubin RJ, Gaucher SM, Molitch M, Krutzik S. **“Recent reports . . . suggest that increased parathyroid gland function may be one of the more common endocrine disturbances associated with hypertension.”** “Compared to a second age- and sex-matched normotensive population**, the hypertensives demonstrated a significant (p less than 0.005) relative hypercalciuria. For any level of urinary sodium, hypertensives excreted more calcium.** These preliminary data suggest that parathyroid gland function may be enhanced in essential hypertension.”

Am J Med 1987 Jan 26;82(1B):27-33. **The calcium paradox of essential hypertension.** McCarron DA, Morris CD, Bukoski R. “This evidence, and the paradoxical therapeutic efficacy of both calcium channel blockers and supplemental dietary calcium, can be integrated into a single theoretic construct.”

Nephrol Dial Transplant. 2002 Oct;17(10):1854. **Insomnia in maintenance haemodialysis patients.** Sabbatini M, Minale B, Crispo A, Pisani A, Ragosta A, Esposito R, Cesaro A, Cianciaruso B, Andreucci VE.

J Neurol Neurosurg Psychiatry. 2008 Feb;79(2):152-7. **A longitudinal study of serum 25-hydroxyvitamin D and intact parathyroid hormone levels indicate the importance of vitamin D and calcium homeostasis regulation in multiple sclerosis.** Soilu-Hänninen M, Laaksonen M, Laitinen I, Erälinna JP, Lilius EM, Mononen I.

J Nutr. 2006 Apr;136(4):1107-13. **Lactose intolerance symptoms assessed by meta-analysis: a grain of truth that leads to exaggeration.** Savaiano DA, Boushey CJ, McCabe GP.

J Allergy Clin Immunol. 1995 May; 95(5 Pt 1): 933-6. **Anaphylaxis to carrageenan: a pseudo-latex allergy.** Tarlo, S M Dolovich, J Listgarten, C

Gut. 1990 Jul;31(7):770-6. **Effects of an enteric anaerobic bacterial culture supernatant and deoxycholate on intestinal calcium absorption and disaccharidase activity.** Walshe K, Healy MJ, Speekenbrink AB, Keane CT, Weir DG, O'Moore RR.

Metabolism. 2003 Aug;52(8):1072-7. **Dietary sodium restriction exacerbates age-related changes in rat adipose tissue and liver lipogenesis**. Xavier AR, Garofalo MA, Migliorini RH, Kettelhut IC.

Hypertension 1994 Apr;23(4):513-30. **Dietary calcium and blood pressure in experimental models of hypertension. A review.** Hatton DC, McCarron DA.

Nippon Geka Gakkai Zasshi. 1993 Apr;94(4):394-9. **[Immunohistological evaluation of parathyroid hormone-related protein in breast cancer with and without**

calcification on mammography] [Article in Japanese] Kanbara Y, Kono N, Nakaya M, Ishikawa Y, Fujiwara O, Kitazawa R, Kitazawa S. “It is suspected that PTHrP is also one of the main factors of calcification in breast cancer.”

Kokuritsu Iyakuhin Shokuhin Eisei Kenkyusho Hokoku. 1998;(116):46-62. **[Plant defense-related proteins as latex allergens]** [Article in Japanese] Yagami T.

J Am Geriatr Soc 2003 Mar;51(3):410-4. **Association between dementia and midlife risk factors: the Radiation Effects Research Foundation Adult Health Study.** Yamada M, Kasagi F, Sasaki H, Masunari N, Mimori Y, Suzuki G.

Am J Hypertens 1995 Oct;8(10 Pt 1):957-64. **Regulation of parathyroid hormone and vitamin D in essential hypertension.** Young EW, Morris CD, Holcomb S, McMillan G, McCarron DA. “The maximal stimulated PTH level was significantly higher in hypertensive than normotensive subjects in the absence of measured differences in serum ionized calcium concentration, serum 1,25(OH)2-vitamin D concentration, and creatinine clearance.”

Mol Immunol. 2007 Mar;44(8):1977-85. **Estradiol activates mast cells via a non-genomic estrogen receptor-alpha and calcium influx.** Zaitsu M, Narita S, Lambert KC, Grady JJ, Estes DM, Curran EM, Brooks EG, Watson CS, Goldblum RM, Midoro-Horiuti T.

^^^ Top ^^^