

Pharmaceutical and Medical Sciences

- An Update

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Pharmaceutical from Microalgae

The power of the sun and sea can be harnessed to produce new generation pharmaceutical products. Commercial quantities of polyunsaturated fatty acids are being produced from oil-rich microalgae grown in photobioreactors on the French and Scottish coasts. Polyunsaturated fatty acids are used in nutritional supplements such as infant formulae which are known to be deficient in these acids in comparison with mothers milk. Babies, especially those born prematurely, need these (Docosahexaenoic acid and Arachidonic acid) for normal brain and eye development.

Antioxidants for Cell Damage Diseases

Oxidation is an important cause of cell damage and death and has been linked to disorders such as Alzheimers disease, Parkinsons disease, emphysema, muscular dystropy, atherosclerosis rheumatoid arthritis and retinal degeneration. A new class of compounds, called nitronerelated therapeutics (NRTs) may be of use in halting or preventing cell damage caused by oxidation. NRTs have been shown to be safe and effective in neutralising the potentially dangerous effects of free radicals, which induce oxidation.

Breakthrough in Fracture Healing

Bone fracture can be healed in just 12 hrs with a single shot of a wonder drug developed by US doctors who claim that patients can skip tedious, weekslong encasing of their broken parts in plaster. This process can stabilize acute wrist fractures. It has several possible future uses including treatment of facial disfigurement and bone breaks caused by osteoporosis. The bone composite material is made up of organic and inorganic components. Mineral accounts for 60 to 70% of dry bone weight, mainly calcium

phosphate. Dahllite provides tensile strength. The process involves and injection prepared by mixing calcium phosphate and calcium carbonate with sodium phosphate solution. After injection, the biomaterial dahllite is formed. Minutes after injection, under ideal physiological conditions, the past begins to harden and paste together the broken bone parts. Complete transformation is achieved in 12 hrs. Clinical trials showed that the pasted bone is durable, weight-bearing and as strong as the natural bone.

Healing of Wound Without Sutures (HWWS)

The conventional method of treating a deep wound injury is to anaesthetise the affected part and suture it. HWWS heals the wound irrespective of length of the wound; but if the wound is deep, the inner muscle layers have to be sutured. HWWS can however, help to obviate suturing of the superficial skin. HWWS comprises of two solutions A and B, an adhesive and a transport adhesive (TAD) tape. Solution A is a herbal extract of plants belonging to Montana group, while solution B is an extract of plants of *C officinalis* group. The adhesive is made of ethylene vinyl acetate copolymers in an organic solvent. The tape has a synthetic adhesive and antioxidants. The procedure involves cleaning the affected site with antiseptic and removal of foreign particles if any. Six drops each, of solution A and B are then applied on the wound. The extra fluid is soaked up with a sterile gauze piece. Following this, the adhesive is spread on either side of the wound. The wound edges are then brought together and the TAD tape placed near and over the wound. With this procedure, the wound heals in a maximum of 10 days time. The nutritional status of the patient and the state of hygiene are some factors which influence the speed of recovery of the wound.

Blood Substitutes Show Promising Future

Haemoglobin based blood substitutes are being developed as promising resuscitative solutions. Molecular modifications of haemoglobin have been performed with an attempt to improve its efficacy and safety. A blood substitute derived from the haemoglobin of outdated erythrocytes has been developed by cross-linking molecular haemoglobin between the alphasubunits by reaction with the diaspirin compound, bis (3,5-dibromosalicyl) fumarate. Diaspirin crosslinked haemoglobin (DCLHb) has been found to be biochemically stable with excellent oxygen carrying capacity. It has been demonstrated that DCLHb produces pressor effect and increases the blood flow to several organs. In the near future haemoglobin based blood substitutes are likely to be available for clinical conditions requiring oxygenation and tissue perfusion.

Tomatoes Prevent Some Cancers

Tomatoes have long been known for their high Vitamin-C content. Current research has proved that tomatoes in the diet may be able to prevent people from developing some cancers. The specific constituent which benefits humans is lycopene. Lycopene, the pigment that gives tomatoes the red colouring, has been proved to protect human cells from nitrogen dioxide a carcinogen present in plenty in tobacco smoke and diesel fumes. Lycopene as an anti-cancer agent was three to four times more effective than β -carotene, which converts it self into vitamin-A in the body. β -carotene can prevent cancer in the colon and bladder. Now, tests carried out have showed protection of human cells against nitrogen dioxide by a factor of 3.4 for β -carotene and a much higher count of 8.6 for lycopene. Lycopene in tomato juice is a worthwhile supplement to the diet of anyone at risk from cigarette smoke or air pollution, but excessive and prolonged intake may cause artificial tanning of the skin.

Onion, Stocking the Heat

An onion is sure to drive heat stroke away, say ayurvedic doctors. The iodine content of the onion absorbs the heat which affects vital parts of the body. It is believed that the outside heat first affects the onion.

Cabbage as a Cure

Cabbage has enhanced food value due to the presence of vitamins. Vitamin C and Vitamin P (citrin) lend strength to the blood vessels. Microelements help regulate metabolism vital to growth and development of a child. It has factors which enhance immunity of the body and arrest its premature ageing. Some of the elements in cabbage help prevent the formation of plaques on the inner walls of the artery. A valuable organic acid called tartronic acid inhibits the conversion of sugar and other carbohydrates into fat. Hence, it is also helpful in weight reduction. A helping of cabbage salad can be the simplest way to stay slim. Fresh cabbage juice helps to cure stomach and duodenal ulcers and treat gastritis in the case of low acidity. It has possess antibacterial activity. Fresh cabbage leaves are used to heal wounds, burns and frostbites.

Crystal Nose that Sniffs out Nasty Disease

Doctors are investigating the possibility of diagnosing certain illnesses by smelling a patients breath with an artificial nose. The device called the Scan Master, relies on vibrating quartz crystals, which are coated with a film of absorbent material, a micrometer thick. When the layer absorbs volatile compounds, the frequency of the vibrations change, enabling the instrument to detect the presence of materials to nanogram quantities. A cluster of these quartz crystals, each covered with a different type of absorbent film, forms the heart of the new sensor. Quartz crystals are very stable and resistant to being poisoned or desensitised by the chemical they are detecting.