The prostate gland is an important part of a man’s urogenital system and it plays the dual role of controlling urination and helping with sexual activity. The prostate is found immediately below the bladder and in a young male adult, it is about the size of a walnut. Cancer of the prostate is one of the most common forms of cancer affecting men. The predisposing factors for prostate cancer include age, race, genetics and environment. The chance of a person having prostate cancer increases with age. It has also been observed that Japanese men living in Japan have very low incidences of prostate cancer as compared to Afro-Americans. However, environment does play a role as well because it was further observed that Japanese men living in the US have a similar risk of the cancer as any other average American man living in the same area. The risk of having prostate cancer can also be hereditary.

Prostate cancer research has been ongoing around the world. At the Cancer Research Campaign Genetic Epidemiology Unit in Cambridge (UK), scientists found that the occurrence of prostate cancer could be highly linked to the mutant form of the BRCA2 gene. The BRCA2 gene was discovered by Prof. Mike Stratton and his colleagues at the Institute of Cancer Research, Sutton, Surrey in 1995. Previously, it has been observed that people with the mutant version of this gene are at a higher risk of suffering from cancers of the pancreas, gall bladder, naso-pharynx and stomach. Women with the faulty gene were found to have a 70 percent chance of getting breast cancer by the time they are 70 years old. Even though male breast cancer is rare, about 10 percent of these occurrences could be due to BRCA2 mutations.

In the UK, the average age for getting prostate cancer is 75 years but men carrying the mutant BRCA2 gene tend to develop the illness at an earlier stage of their lives. Therefore, it is advisable for males carrying the faulty gene to go for regular screening so as to ensure early detection of the cancer.

In another discovery, a protein called E-cadherin could be a help in preventing the spread of prostate cancer to other parts of the body. It was previously known that reduced levels of E-cadherin are directly linked to advanced cancer. Professor Hendrix and her group at the University of Iowa working with the Dunning R-3327 rat prostatic adenocarcinoma model found that restoring levels of E-cadherin caused the cancer cells to stick together, thus preventing them from spreading around the body.

The team is now looking into the possibility of extending the studies in rats to humans. By using the technology of gene therapy, there is a potential of introducing the E-cadherin gene into the body and thus providing great hope in slowing the spread of prostate cancer within the body and improving the survival chances of the patients.

“Research on BRCA2 and E-cadherin provides hope for prostate cancer patients.”
The cultivation of groundnut is very important for India’s oilseeds economy because it contains a much higher percentage (40 percent) recoverable oil as compared to soyabean (17 percent) or rapeseed/mustard (35 percent). Furthermore, groundnut oil is preferred throughout the country as a cooking medium. India has the world’s largest acreage under groundnut (8.5 million hectares) but in terms of productivity and quality, she loses to China which has a production in excess of 10 million tonnes.

In order to step up the productivity and quality of groundnut, a program was jointly launched by the United Nations Development Programme, the Technology Mission on Oilseeds and Pulses and the Indian Council of Agricultural Research. Dr. M.S. Basu who is the national coordinator for groundnut research will oversee the polythene mulch groundnut cultivation technology which has revolutionized groundnut cultivation. The polythene film mulch is very useful during the post-rainy season as it can allow a net saving of water to about 46 percent. Furthermore, this will increase the potential of introducing groundnut in the north-eastern region of India during the post-rainy season. The groundnut can be grown in the residual moisture of rice fallow land which otherwise would remain vacant. This effort will help to raise the productivity level of groundnut as over 70 percent of groundnut production in India is presently under rainfed conditions.

Another effort at increasing productivity would be the introduction of groundnut as an inter-crop with other field crops such as maize, soyabean and upland rice. This will be very useful in the north-eastern region where sole crop systems are practised traditionally.

Through research undertaken by the All-India Co-ordinated Project, drought-resistant varieties with better moisture capture and partitioning are being developed in collaboration with international research agencies. Confectionery grade groundnut varieties are being identified in terms of their protein and sugar contents, oleic/linoleic ratio, etc. This research aims at not only increasing productivity but also ensuring quality of the groundnut produced.

The menace affecting the quality of groundnut is principally aflatoxin. Aflatoxin is a fungal growth which is known to be carcinogenic and makes groundnut kernels unsafe for consumption. Dr. Basu stressed that operations to promote groundnut export from India must be reorganized to tackle the aflatoxin problem. This is because the European Union, being the largest importer and consumer of groundnut kernels, has imposed strict aflatoxin regulations on groundnut consignments from origins such as India.

The groundnut aflatoxin management program at the farm level has been carried out in villages of high aflatoxin risk at Anantapur in Andhra Pradesh. According to Dr. Basu, the most effective way to curb the aflatoxin menace is to integrate pre- and post-harvest technologies known to have a bearing on the aflatoxin contamination and to blend them with available testa resistance. The important components of the pre- and post-harvest technologies include varietal selection matching phenology with growth environment and testa resistance; crop rotation with legumes, vegetables, etc; soil moisture management and conservation; harvest at optimum physiological maturity; steady reduction in pod moisture; mechanical separation of well-filled pods from damaged and poorly-filled pods; quick natural drying in small heaps with pods upside; and storage of pods at seven to eight percent moisture in dehumidified warehouses.

Finally, a supervisory audit team should be formed to monitor the production and processing standards as well as to maintain passport data related to growth conditions, grading methods, phyto-sanitary certification, etc. Furthermore, the Export Inspection Council should oversee the final clearance for export.
An Alternative to Heart Surgery

A research team at Cornell University, led by Professor Ronald Crystal, has successfully developed a new gene therapy touted as an alternative to surgery. In coronary heart disease (CHD), fatty deposits clog the insides of arteries, preventing blood flow and resulting in heart attacks and circulation problems. Bypass surgery (where blood is diverted around the blocked arteries to increase the amount of oxygen transported to the heart) and angioplasty (a technique which involves the inflation of a balloon in the artery to improve blood flow) are the current treatments used for the above condition.

The new gene therapy allows for new blood vessels to grow around blocked arteries. It can be applied simply via an injection without causing any adverse side-effects. As reported in the *Circulation* journal, this technique was found to be safe for use in humans, especially in heart patients whose conditions are far too advanced or complex for surgery. Injections were given to 15 patients who were due to have heart surgery, and six who were not. All experienced a reduction in frequency and intensity of chest pains, and tests showed improved blood flow to the heart and evidence of blood vessel growth.

Although the results of the research appear promising, the British Heart Foundation advises caution in the interpretation of results as the study involved only a small group of people. More research is necessary before strong conclusions can be drawn.

The same journal reported a second study, detailing a blood test that can predict a person’s potential to grow new blood vessels spontaneously. According to Dr. Andrew Levy, this test is useful as it can be used to identify coronary patients with low potential to generate new vessels, thus effectively treating them with drugs or surgery to increase this potential. There is also a possibility that the test can be used to improve treatments for cancer patients and diabetics. Such patients, whose tests show a high potential, would require more aggressive treatment than patients who show a low potential for new vessel growth.

Mussels to Cure Cancer

A potential cancer cure has emerged from the waters around New Zealand. A member of the shellfish family — the green-lipped mussel — is believed to be the next weapon in the fight against cancer. Extracts from the mussel have been used for some time to alleviate the pains of arthritis, it was only recently that scientists have explored its anti-cancer action. The natural arthritis remedy is marketed under the name *Lyprino*®, which is already available in British pharmacies. According to Dr. Henry Betts, principal research scientist in the Rheumatology Research unit at the Queen Elizabeth Hospital in Adelaide, *Lyprino*® can kill cancer cells in 24 hours. Although these are only test tube trials, scientists are confident that *Lyprino*® will work similarly in the human body. The hypothesis is that if *Lyprino*® is effective in treating arthritis and asthma, it can probably be used to cure cancer as well, since the same metabolic pathways are involved. *Lyprino*® has an added advantage over other anti-cancer drugs in the market as it is natural, nutritionally beneficial and thus will not cause any side-effects like the synthetic drugs. As the green-lipped mussel is the only variety that contains the cancer killing oil, the New Zealand mussel industry has expressed concerns over the possibility of overwhelming demand. It is predicted that if a positive outcome results from the human trials, the industry will have problems keeping up with the demand.

The New Zealand Cancer Society is also warning cancer patients not to rely on the green-lipped mussel to kill deadly cancer cells, until further tests are conducted. There are plans to conduct human clinical trials involving more than 100 cancer patients. Researchers hope to discover the full scope of the marine extract from these trials.
The forests of West Africa have yielded a possible cure to the deadly Ebola virus — the *Garcinia kola* plant. Laboratory trials have shown that a dimeric flavonoid (two flavonoid molecules fused together) compound from this plant is effective in preventing the multiplication of the virus. If the same results can be obtained from human and animal trials, this plant may be the means to treating the virus that causes Ebola haemorrhagic fever — an often fatal condition.

There are four strains of the virus — the Ebola-Zaire, Ebola-Sudan, Ebola-Ivory Coast and the Ebola-Reston; the first three affect humans while the last type affects only monkeys and chimpanzees. The Ebola virus was first documented in 1976 after an outbreak in Zaire, where over 270 of the 318 people infected died. A similar outbreak occurred recently in the same country, reporting a death rate of 81 percent of the 315 infected. Thus from the death toll of the 1976 and the 1995 outbreaks, the virus is apparently very lethal. It multiplies very rapidly in the human body and quickly overwhelms it. In advanced cases, the patient develops high fever and severe bleeding. The call for a cure is urgent as doctors are desperate to find means to stop the spread of infection.

A decade ago, researchers were led to the *Garcinia kola* plant by traditional native healers who have used the plant for the treatment of infectious diseases for centuries. Subsequently, compounds from the plant were also proven to be effective against some strains of flu. Dr. Maurice Iwu, head of the Bio-resources Development and Conservation Programme, is one of the leading scientists in the field of *Garcinia kola* research. Dr. Iwu believes that the same forest that yielded the dreaded Ebola virus could be a source of the cure. The discovery of the anti-Ebola compound was announced at the recent 16th International Botanical Congress in St. Louis, USA.

Although tests are in the early stages and the compound is still a long way from being approved by the US Food and Drug Administration, researchers are hopeful that the compound can be developed as a drug and placed on the market within a few years. This compound not only has important properties, it is also non-toxic, occurring naturally in orange and lemon rinds. In addition, researchers were quick to point out that even if this particular drug does not succeed in being approved, the compound can still be used as a template for future work as its structure can be modified accordingly. In due time, a new drug can thus be constructed for this deadly disease.