Annual Review of Medicine 1992. Vol. 43, W. P. Creger, C. H. Coggins, E. W. Hancock, eds. Annual Reviews Inc., Palo Alto, California, 94303, USA. 1992. 576 pp. $49.00.

Medicine, Lewis Thomas wrote, is the youngest science. That was several years ago. After its alliance with biology, medicine has developed into a mature scientific discipline termed as bio-medicine. There has been a spurt in growth in this field thanks to rapid advances made in molecular biology. The annual reviews of medicine during the past few years have provided glimpses of this advancing frontier. This year is no exception.

The current volume has forty reviews which cover a broad range of topics such as genetics of multiple endocrine neoplasia syndrome, clamydial and Epstein barr infections, transient ischaemic attacks, electrocardiographic late potentials, suicide, organ transplantation and mechanical ventilators.

Thirteen articles echo the influence of molecular biology in either understanding disease mechanisms or diagnosis of diseases or evolving therapeutic strategies.

An article of outstanding interest is titled 'therapeutic approaches to haemoglobin switching in treatment of haemoglobinopathies'. The authors provide an excellent concise review of regulation of haemoglobin synthesis, pathophysiology of haemoglobinopathies and discuss the pharmocological manipulation of foetal haemoglobin synthesis. In the management of diseases such as sickle cell anaemia and beta thalassaemia, foetal haemoglobin has a potentially beneficial role in modulating their pathophysiology and it is possible to think of increasing the synthesis of HbF. Through pharmacological agents efforts are being made to manipulate cellular and molecular regulatory mechanisms of haemoglobin synthesis in order to reverse the developmental lesions in globin gene expression. Among the several agents that have demonstrated activity in patients with haemoglobinopathies, the most promising one is hydroxyurea which awaits a controlled clinical trial.

Every one knows that human red blood cells in the peripheral blood do not have DNA. But information on inherited abnormalities of red cell enzymes can be obtained only by the study of the DNA. To investigate red cell enzymopathies and determine the characteristics of the abnormal enzyme, one has to isolate red cells from large samples of blood and purify the abnormal enzymes. Modern techniques of molecular biology have made it possible to obtain the same information from the nucleated white blood cells of less than one millilitre of blood. The techniques make it possible to identify mutations in hereditary red cell enzyme defects. Much data have been acquired which are useful in the DNA analysis of the most common of the red cell enzyme defects, viz. glucose-6-phosphate dehydrogenase deficiency and is summarized in an article by E. Beutler.

Pathogenesis of five diseases are discussed in the book. They include gastroduodenal disease due to *Helicobacter pylori* infection, colon cancer, chronic granulomatous disease, and Osteogenesis imperfecta. Thyroid hormone resistance, which serves as a prototype for 'resistance' syndrome caused by defects of hormone receptor sites, is also included.

Observations based on genetic studies in sporadic colon cancer and the inherited syndrome familial adenomatous polyposis suggest that colon cancer could result from the combined effects of multiple genetic mutations which leads to activation of oncogenes and inactivation of tumour suppressor genes. A unified scheme for colon carcinogenesis and future directions to define the molecular pathogenesis of colon cancer are presented. Progress in research in this area would lead to screening tests, diagnostic marker and new treatment modalities.

Brittle bone disease results from mutations in the genes that encode the chains of type I collagen. Byers and Steiner focus attention on recent studies that have made significant inroads into the molecular diagnosis and prognostic counselling of the disease.

Our understanding of the inherited disorder chronic granulomatous disease has considerably improved since the identification, characterization and molecular cloning of many of the components of the phagocyte NADPH–oxidase complex. The genetic basis of the disease and the role of recombinant human interferon gamma as a therapeutic agent form the subject of another review.

Yet another article is devoted to medical genetics, and it pertains to glucose transporters. Facilitative glucose transporters, numbering five and one concentrative glucose transporter have recently been cloned and their molecular structure elucidated. Dysfunction of these transporters is being linked to a number of diseased states, particularly defective insulin secretion and insulin resistance in diabetes mellitus.

'Detection of microbial nucleic acids for diagnostic purposes' is a curtain raiser to the diagnostic revolution in the routine diagnosis of infectious diseases with the use of molecular probes and gene amplification methods.

There are two fine examples of advances in the field of parasitic immunology, viz. tropical pulmonary eosinophilia and schistosomiasis. Studies on immunologic aspects of schistosomiasis have allowed defining molecular targets for vaccine development. Moreover, they have also shed light on the function of eosinophils and platelets in immune defence and on the protective role of anaphylactic antibodies.

Several treatises are concerned with medical treatment. Among them, the most exciting is 'medical treatment of inflammatory bowel disease'. Elucidation of the intestinal mucosal immune systems and pathogenesis of inflammatory bowel disease have led to novel therapeutic approaches to Crohn's disease and ulcerative colitis. The drug therapy is no longer limited to aminosalicylates and corticosteroids. New options consist of inhibitors or antagonists of leukotrienes, immunosuppressive and immunomodulatory drugs as well as neuropeptides.

The most informative review in clinical pharmacology relates to quinolone antimicrobial agents. The chemistry, microbiology, pharmacology and clinical use of the fluoroquinolone antimicrobial agents are presented. The clinical areas in which fluoroquinolones have been investigated are detailed with particular attention paid to areas of appropriate and inappropriate use.

Other subjects in therapeutics which have gained editorial attention are, new thrombotic agents, antiplatelet drugs, the use of calcitriol therapy in patients

with renal failure and the risks and benefits of oestrogen replacement in postmenopausal women.

Fentiman has highlighted a new drug on the horizon which appears to be a good prospect for the prevention of breast cancer, a major killer and one of the common cancers in women. Tamoxifen, originally synthesized for use as an oral contraceptive, has been proved to be as effective as high doses of oestrogens in patients with advanced breast cancer. It neither produces loss of bone density nor hypercholesterolaemia, and evidences suggest that the drug may be effective as a preventive agent.

Syncope and solitary pulmonary nodule are two clinical conditions which pose diagnostic dilemma because of their diverse aetiology and make therapeutic decision-making difficult because of potential serious consequences. Stepwise strategies for clinical evaluation and management of the two problems can be found in this volume.

Surgical topics are not sparse. The factors affecting the prognosis of patients with oesophageal varices and the options for treatment are given. The results of a multiinstitutional clinical trial by a study group in Japan comparing prophylactic portocaval shunt with conventional management as well as the results of metaanalysis of controlled trials comparing sclerotherapy with conservative treatment have been reviewed.

In the field of organ transplantation, the editors have chosen pancreas, lung and kidney transplantation.

Appropriately, pulmonary complications, a major cause of morbidity and mortality in patients who undergo organ transplantation have also been dealt with in a separate article, which emphasizes methods for prevention, diagnosis and management of these complications.

Both the surgeons and anaesthetists would find useful Hinson's informative write-up which gives an excellent description of the pathophysiology of mechanical ventilation along with a profile of commonly available commercial ventilators.

Atkinson, Orenstein and Krugman draw attention to the resurgence of measles in the United States during 1989–90. The authors describe the changing epidemiology of measles, explore the reasons for the resurgence and discuss potential means for better prevention of measles in the.future.

To summarize, as in the past, the *Annual Review of Medicine* contains comprehensive and instructive records on a variety of common clinical problems as well as exciting subjects of current interest. Neurology is perhaps under represented. None of the subjects in dermatology has found a place in this volume. Every year, I miss in *Annual Review of Medicine* the auto-biographical sketch which is a regular feature of *Annual Review of Biochemistry and Annual Review of Microbiology.*

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Annual Review of Plant Physiology and Plant Molecular Biology 1991. Vol. 42, W. R. Briggs, R. L. Jones and V. Walbot, eds. Annual Reviews Inc., Palo Alto, California, 94303, USA, 1991. 762 pp.

This volume contains twenty-five reviews grouped under biochemistry and biophysics, genetics and molecular biology, cell differentiation, tissue, organ and whole plant events and acclimation and adaptation. The prefatory chapter by E. Marrè gives a personal glimpse of motivations for research and relationship between plant physiology, biology and the unity of life.

In the field of stress physiology, a far more dynamic communication between root and shoot is emerging. Leaf conductance and extension rate rather than the water potential seem to be more useful indicators of water stress. The association of low stomatal conductance with a high water potential indicates that stomata regulate the leaf water status. There is strong evidence that plants can sense the water status of soil around the root and communicate this information to the shoot through a signalling mechanism. These signals seem to regulate also leaf initiation and its overall development. The signals have yet to be identified but abscisic acid (ABA) seems to be involved. Its level increases substantially following mild soil drying and in corn the xylem ABA levels correlate well with the soil moisture.

The role of homeotic genes in plant development has now emerged as a very fruitful area of research and it is in this area that major advances will occur in the near future. Teratologies, several of which represented homeotic transformations, were studied and catalogued in the 19th and early 20th centuries but it is only now with the application of molecular genetics to *Antirrhinum* and *Arabidopsis* that useful models of flower development have been proposed. In *Antirrhinum*, the wild-type *floricaula* product regulates the transition between inflorescence and floral meristem and in its absence, flower is replaced by an indeterminate shoot. This class of general mutations has also been identified in alfalfa, tomato, maize and *Arabidopsis*. The analysis of whorl identity mutants, especially those that affect the identities of organs in two adjacent whorls is proving very incisive in formulating models to explain the specification of various whorls. The homeotic genes such as *deficiens*, *agamous* and *floricaula* probably function as transcription activators and their expression is transient and restricted to specific whorls.

The isolation and characterization of organ or tissue-specific genes continues to be a major research activity. Surprisingly there is substantial overlap (60–65%) between the genes expressed in pollen and in vegetative tissue. A thiol endopeptidase (TA56 gene) may be involved in the degeneration of the connective and stomium prior to another dehiscence. Likewise two genes encoding enzymes for the digestion of extracellular polysaccharide material in the stigma and style have also been identified. The S-gene product in *Nicotiana alata* has ribonuclease activity and a differential degradation of RNA in elongating pollen tubes may be a critical part of the incompatible response. In higher plants the sperm cells are highly organized and living sperms have been isolated in several species. The sperm cells are connected to one another, physically associated with the vegetative nucleus and transported within the pollen tube as a linked unit termed the male germ unit. The two sperm cells