

of them are vague. They range from cytokine adjuvants for cancer immunotherapy to T cell therapy for human viral diseases and the possibilities in xeno-transplantation of organs, and they could be said to end in a notable review of the politics and mechanics of immunodiagnostic tests, in the example of HIV. This is an eclectic collection by any standards, and as would be expected, the quality varies, although few fall below the minimum required for coherence and 'comprehensiveness'. There is, in fact, a reassuring air of 'solidity' about the latter virtue.

There is, however, a sense of rote about many reviews despite being well-written, because they do not seem to stem naturally from exciting new breakthroughs in their area, but rather come as though an *a priori* decision had been made to include them for extraneous reasons. The sterling exception to that, and arguably the best review in the volume, is the review by Bevan and his colleagues on the selection of the T cell repertoire. It provides a terse and succinct background, sets up the theoretical paradox—that T cells need to recognize something during their development in order to be identified as useful and allowed to survive, but if they do recognize anything in the body at this time they are killed off in order to avoid the dangers of autoreactivity. Having stated the dimensions of the problem, the review then looks at the periphery of the problem, so to say, and examines the current status of ideas and data on, for example, the role of co-receptors in such selection and how these co-receptors are regulated during selection, before plunging into the genesis and testing of the various possible hypotheses that can explain the interactions between T cell receptors and their ligands that has made this so fermenting a field in recent years. The demonstration that peptides have a significant role to play in positive selection rather than only in negative selection of T cells, of landmark value enough by itself, is thus set in context and taken further to bold predictions of what may be happening *in vivo*—a peroration that fits well at the end of a rattling good read. Would that more reviews in this commodious compendium were as riveting.

SATYAJIT RATH

National Institute of Immunology,  
Aruna Asaf Ali Marg,  
New Delhi 110 067, India

---

**Annual Reviews of Medicine 1995.** Cecil H. Coggins ed. Annual Reviews Inc, 4139, El Camino Way, Palo Alto, California 94303-0139, USA. Vol. 46. Price: USA \$ 47, Elsewhere \$ 52. 549 pp.

---

Medical literature has become a big jungle these days, what with more than 30,000 biomedical journals pouring in data at a phenomenal pace. A novice in the field will find it difficult, if not impossible, to get at the rose wood and the teak wood in the jungle, instead he may get lost in the midst of the dead wood. Books like the medical annual will go a long way in helping people to know the useful research data and the milestone developments in their respective fields. This kind of book also could give the distilled wisdom in the field. 'Where,' said T. S. Elliot, 'is the wisdom we seem to have lost in knowledge?' and 'where,' he asked, 'is the knowledge we seem to have lost in information?' To convert the whole lot of information from the ordinary journals one needs to have a system whereby the juniors could get at the truth.

The editors of the medical annual have a very difficult task to pick and choose only a small fraction of the new knowledge generated during the year under review. The chapters in this book will, perforce, have to be patchy and choosy. However, this edition has been more than fair to the subjects under review. They have also selected the right people to do the reviews. People like Norman Kaplan, Erik Mogenson and Mark Pfeffer are all giants in their own fields, to mention only a few whose work I have direct experience of.

Molecular biology, new face of tuberculosis, brain imaging in schizophrenia, newer viruses, ventricular remodelling and organ transplantations are all the hot topics of the day and have all been judiciously reviewed. The index is a pleasure for the reader.

As in the previous issues of the medical annual which I have been following ever since 1964, the present one has kept up its high standards of the contents and the contributors. I had the pleasure of reviewing this good book two years ago for the *British Postgraduate Medical Journal* where I had expressed similar sentiments.

The book has been produced well, the print and the paper are also good. Overall this book should get very high marks

and I have no hesitation to recommend it strongly. This must be compulsory reading for all the postgraduates and others in practice. I would have been happier if they had included a review of the newer problems in the field of tropical diseases, as some of them like malaria, have come back with a vengeance, and do not follow the old time pattern at all; as also the dangerous scenario of nosocomial infections.

The research into malaria and its molecular biology is more than just of practical importance. It has more to it than what meets the eye. An important current topic is the localization of genes implicated in the susceptibility to common chronic diseases. This has been greatly facilitated by the use of polymerase chain reaction. An interesting recent observation has been the apparent protection against autoimmune diseases like rheumatoid arthritis and systemic lupus erythematosus in areas of west Africa where malaria is endemic, in contrast to the high incidence of these in west African-origin Americans. If this is correct, it would be a good example of the old saying that 'autoimmunity is the price paid for eradicating infectious diseases'.

The book is highly recommended despite these remarks.

B. M. HEGDE

Kasturba Medical College,  
Mangalore 575 001, India

---



---

**Tropical Diseases: Molecular Biology and Control Strategies.** Sushil Kumar, A. K. Sen, G. P. Dutta and R. N. Sharma, eds. CSIR, New Delhi. 1994. 773 pp.

---

The prevalence of tropical diseases in India has some very impressive statistics: Forty million people are chronically infected with filariasis, 4 million with leprosy, 0.25 million with Leishmaniasis, 1.5 million tuberculosis cases, 1.0 million malaria cases and equally dreadful number of people with diarrhoeal infection in a year. Rough, probably conservative, estimates these are. As if these diseases are 'inseparable but terrible companion of man' in this country. The urgency to control these diseases cannot be over-

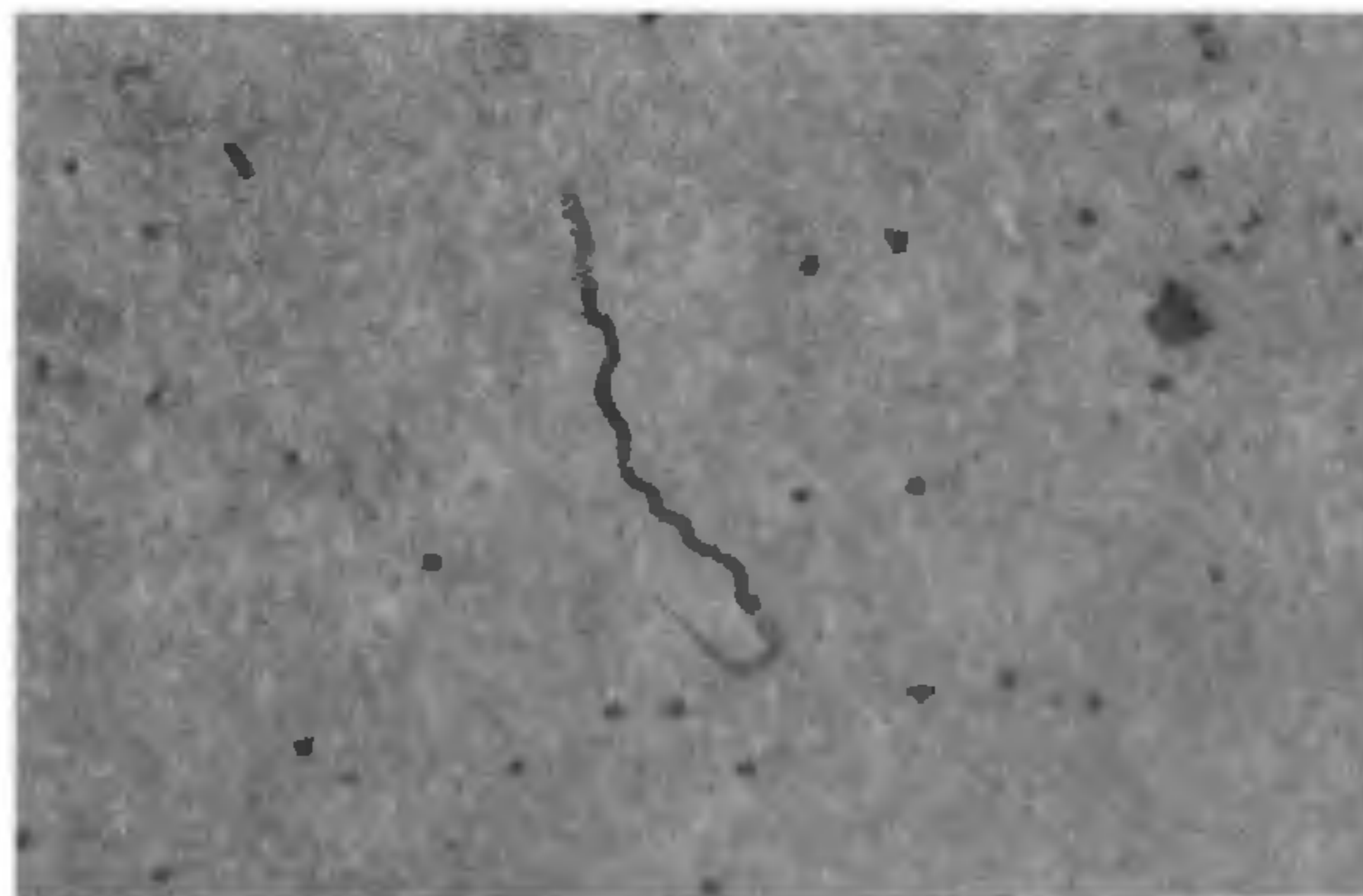
emphasized. Paradoxically, guidelines to control programmes are rather well known. These are chemotherapy, early diagnosis, development of vaccines, eradication of vectors and imparting health education to the community. But nothing could be easier said than done. Effective eradication of tropical diseases poses formidable challenges. There are 'friendly' vectors (mosquitoes, flies) to transmit some 'deadly' diseases like malaria, filaria, kala-azar, encephalitis, etc. Poor hygienic and socio-economic condition add to the misery and severity of the disease. (Parasitic diseases are unfortunately diseases of poor people.) In addition to a plethora of such problems, one is faced with pathogens getting resistant to drugs and vectors to insecticides. The organisms have developed sophisticated survival mechanisms to neutralize host's immune response, to act as 'smoke screen' so that host is unable to elicit protective immunity against the organism. (The process of parasitism is as old as life itself.) Answers to these problems can be found in understanding the fundamentals of host-parasite interactions. It is the belief of many researchers including the present reviewer that new strategies to control tropical diseases can be developed by the application and resources of biomedical sciences to pinpoint new drug targets, to develop diagnostics, to identify and clone protective antigens. It is indeed appropriate that CSIR, as a part of its Golden Jubilee celebration, brought together 250 scientists and research scholars working in tropical diseases for a national symposium held at Central Drug Research Institute, Lucknow (February, 1992), India. *Tropical Diseases—Molecular Biology and Control Strategies* is the title of the book, which consists of 93 papers presented at this symposium.

About half of the book is on filariasis and malaria. Discussion on filariasis begins with a paper on the natural history of infection followed by two papers on immunodiagnosis. The natural course of filariasis, which is a chronic disease, spanning decades needs to be established. The natural course of events starting from infection (bites of mosquitoes carrying infective larvae of the parasites) to the onset of clinical symptoms in humans will undoubtedly be complex, and needs to be studied. A good diagnostic should be able to 'detect' target population (be

it asymptomatic microfilaraemic individuals or clinical filarial patients or even individuals 'exposed' to the infection). Early diagnosis of filariasis is a key area linked to control. Present efforts are directed in developing assay systems to detect microfilaraemic carriers. The two papers sum up the progress employing antibody and antigen assays. The latter system detects active infection (presence of parasite) in contrast to antibody assay which in principle cannot differentiate present from past infection. The last words on this difficult subject definitely have not been said. Two papers deal with protective mechanisms in filariasis using animal models. Extension of such studies to humans needs to be initiated. The drugs available for treatment and control of filaria are unsatisfactory and limited. The widely used Diethylcarbamazine lacks adult worm-killing activity, produces adverse reactions in humans, thereby limiting its use for mass therapy. The alternative, Ivermectin, is no better. There is thus a need to synthesize interesting molecules or to identify plant products that could be used as drugs in filariasis. Five chapters are about this subject. Vector control measures either for malaria, or filaria or kala-azar constitute a vital component in tropical diseases research. Four papers discuss this topic. The contents range from application of anti-vector agents in plant extracts, larvivorous fish (*Gambusia affinis*), insecticide impregnated bed nets, insecticides, to even physical removal of weeds (breeding sites) by community participation.

The ability of *Plasmodium falciparum*, the major parasite for human malaria, to overcome anti-malarial drugs is a major

hindrance to the control of malaria both in individual and community levels. There are nine papers on the synthesis and mode of action of anti-malarial drugs. Efforts are made from CDRI, Lucknow, to synthesize better derivatives of Chinese drug Quinghasou (Artemesin) against cerebral malaria and new 8-aminoquinoline derivative (CDRI 80/53) against *P. vivax* infection. The biochemistry of malarial parasites and parasitized erythrocytes is a subject of extensive research. A set of eight papers addresses this issue. Enzymes of the parasites have been proposed to be the target of drug design, diagnostic and protective antigens. These assumptions rest on the premise that parasitic enzymes should differ substantially from host (mammalian) enzymes in structural and immunochemical properties. In most cases they are. Antibodies to lactate dehydrogenase of *P. falciparum* were demonstrated as serodiagnostic marker in malaria, polyamine oxidase as potential target for chemotherapy of protozoan diseases. The characterization of lactate dehydrogenase as a possible immunodiagnostic agent indicates an important finding. The production of reactive oxygen species by phagocytic cells is known to be a general defense mechanism against various pathogens. The role of free radicals and lipid peroxidation in malaria has been discussed in two papers. Development of vaccines for malaria with the usual steps of antigen identification, immunogenicity and adjuvant selection is fairly at advanced level compared to other parasitic diseases of man. Two papers report interesting work using synthetic peptides of RESA (ring infected erythrocyte surface antigen) and MSA (major



Microfilariae of human filarial parasite *Wuchereria bancrofti*.

## BOOK REVIEWS

---

merozoites surface antigens) of *P. falciparum*.

There are six papers on the visceral leishmaniasis or kala-azar. Immunodiagnosis will be highly useful in leishmania, diagnosis of which at present depends solely on biopsy materials. The procedure is painful and inconvenient. DOT-ELISA and direct agglutination tests have been recommended for immunodiagnosis and are discussed comprehensively in three papers. A paper describes the generation of monoclonal antibodies to *L. donovani* whose utility should have been explored. A set of thirteen papers discusses mycobacterial infections, tuberculosis and leprosy. Most of the papers are about the immunodiagnosis. A monoclonal antibody-based assay was described to be useful for diagnosing progressive form of leprosy. Paediatric population is the worst sufferer in any infection, tuberculosis is no exception. It is of interest to note that excretory secretory antigens of *M. tuberculosis* could be used as diagnostic antigen in detecting pulmonary and extrapulmonary tuberculosis in children. The diagnostic utility of ES antigen has parallel in the previous work of this group (Sevagram) in filariasis. A paper reported the lack of production of oxygen radicals from macrophages of leprosy patients and the consequent killing ability; which interestingly can be restored by delipidified cell component of *M. leprae*. Immunology of

leprosy is often synonymous with poor delayed type hypersensitivity reaction and immune unresponsiveness. An easily cultivable mycobacterium, *M. habana*, has been reported to break this immunological tolerance. Development of vaccine has been a major focus in leprosy research. Immunotherapeutic potential of much known ICRC (Indian Cancer Research Centre) vaccine has been described in one paper. A single dose of vaccine can significantly upregulated *M. leprae*-specific immune responses in lepromatous leprosy patients.

Seven papers are about micro-organisms (*E. histolytica*, *Giardia lamblia*, *Vibrio cholerae*, *E. coli*) that cause diarrhoeal disorders. Papers on the molecular biology of cholera and designing drugs based on molecular mechanism of diarrhoea are noteworthy. There are also two articles on 'ubiquitous' liposomes, as drug delivery vehicle specifically in malaria and in systemic fungal infections. As the role of liposomes in reducing the toxicity of drugs is now well known, its application at least in the later disease and kala-azar may well be accepted for humans in future.

A lone paper on Japanese encephalitis mention the generation of cytotoxic T lymphocytes and the nature of infected cell lysis. A paper on DNA probes describes the usefulness of the technology in detecting infections for *M. tuberculosis*. There are papers on the genetics of antibiotic resistance in pathogenic *A. cineto-*

*bacter*, a gram-negative bacteria capable of causing diverse infections and also on human oncogene expression.

The role of traditional medicines (Ayurveda) in the health care of a traditional country like India is very important. A paper describes the activity of plant extracts, selected on the basis of ethenobotanical information, against bacteria (*Klebsiella* sp., *E. coli*, *Shigella flexneri*) causing gastrointestinal and urinary tract infections. Clinical trial of 'Mahakhandaw churna' showed it to be very promising in intestinal amoebiasis compared to metronidazole.

There are some weaknesses which are inevitable perhaps in a book with such a broad range of topics with so many contributors. Some topics (disease) have been dealt reasonably comprehensively, some cursorily. I wonder if the editors could not have organized the papers under sections disease-wise for instance. The book is not free from printer's error either. Nevertheless the editors are to be congratulated for preparing the book which will be an useful addition to the libraries of all laboratories engaged in parasitic disease research. There is something for everyone here.

MANOJ K. DAS

Regional Medical Research Centre,  
Bhubaneswar 751 016, India