CURRENT LITERATURE

This department carries selected abstracts of articles published in current medical journals dealing with leprosy and other mycobacterial diseases.

General and Historical

Dao, A. H., Gregory, D. W. and McKee, L. C. Specific health problems of Southeast Asian refugees in middle Tennessee. South. Med. J. **77** (1984) 995–1000.

Three diseases representative of specific health conditions affecting the Southeast Asian refugees living in middle Tennessee are leprosy (chronic bacterial infections), liver fluke infection (parasitic diseases), and hemoglobin E-β-thalassemia (hematologic disorders). In this paper we discuss incidence, causative agent, mode of transmission, metabolic abnormalities, and management of these conditions.—Authors' Abstract

Dols, M. W. The leper in medieval Islamic society. Speculum **58** (1983) 891–916.

"The Leper in Islamic Society" represents an important contribution to the literature of the history of leprosy. The author's aim, "to evaluate the social implications of the disease," is carried out by an in-depth review of medical, social, religious, legal, and other citations pertaining to leprosy in medieval Islamic culture. The report is largely a derivative one, consisting of 141 references, many of which are expanded by detailed footnote annotations. As such, the article will be of continuing value to scholars and researchers interested in documenting the historical development of leprosy and its effects upon society.

An important secondary contribution of this article is to show that the stigma of leprosy cannot be attributed mainly to Biblical influences, that is, it is clearly documented by the author that Islamic religious, legal, medical, and social customs reflected many of the same fears and concerns with leprosy as those of medieval Christian Europe. Differences existed, of course, particularly with respect to a lesser degree of Islamic societal rejection of leprosy patients, but essentially it is clear that much of the stigma of leprosy is caused more by inherent characteristics of the disease and its manifestations than by historical and social heritage factors. Thus, as stigma unfortunately continues to be a major problem in many leprosy control programs, studies such as this contribute meaningfully to contemporary leprosy management practice.—R. J. O'Connor

Prioleau, E. Leprosy. Reality and metaphor in literature. Am. J. Dermatopathol. **5** (1983) 377–380.

What is strangest in the long chronicle of leprosy in literature is how tenacious the theme has been. Despite the ebbs and flows of the disease, despite modern diagnostic and therapeutic advances, leprosy has retained an uncanny grip on the literary imagination. From the start, leprosy has been almost synonymous with horror, the alien, the dark, the repellant—supernatural extremes. Leprosy has always been called out for strong effects like the kettledrum, even as it has reflected the timbre and themes of each epoch. The leprosy patient was someone with a special destiny, tapped for damnation, sainthood, or a combination of both. Nowhere is he treated as a complex, real, vulnerable human being with Hansen's disease. Perhaps this is the new challenge for literature: to restore his personhood, to remove the mask of symbolism, and see his real face—the face of all humanity.—(*From* the article)

Chemotherapy

Anderson, R. The immunopharmacology of antileprosy agents. Lepr. Rev. **54** (1983) 139–144.

Inadvertent immunological reactions may occur during treatment of some leprosy patients with antileprotic drugs. The author speculates that this is due to the formation of immune complexes and loss of antigen-induced immunosuppression. Rifampin, dapsone, and clofazimine may all precipitate erythema nodosum leprosum and/or reversal reactions. The effects of these drugs may be modified by their immunochemistry which is distinct from their antimicrobial effects. Dapsone has anti-inflammatory effects but also stimulates polymorphonuclear leukocyte migration and T lymphocyte proliferation. The balance of these effects is postulated to lead to enhanced immunological reactions. Clofazimine in contrast has additional, useful, immunosuppressive properties which reduce or prevent such reactions. Rifampin has no clearly established effects on immunological processes *in vivo*.

[Immunopharmacology in leprosy is complex and controversial but the author's analysis, often admittedly speculative, will undoubtedly stimulate further useful work.]—M. Hooper (*From* Trop. Dis. Bull.)

Birch, M. C. Leprosy treatment in Nepal with multidrug regimens. Lepr. Rev. **55** (1984) 255–264.

New multidrug treatment regimens have recently been recommended for use in leprosy control programs by the World Health Organization. This study was performed at Green Pastures Leprosy Hospital, Pokhara, Nepal, where multidrug regimens have been in use for 7 months. It was aimed at detecting problems resulting from the introduction of the new treatment.

No major difficulties with the use of multidrug regimens for leprosy treatment have been encountered, although several initial practical problems have arisen which may easily be remedied.

This study has failed to detect any significant side effects associated with the use of multidrug regimens. Furthermore, few leprosy "reactions" during multidrug treatment regimens have been reported.—Author's Summary

Cottenot, F., Wallach, D., Flageul, B., Pennec, J. and Wastiaux, K. Deux cas de rechutes résistantes à la rifampicine dans la lèpre lépromateuse. [Two cases of relapses resistant to rifampin in lepromatous leprosy.] Ann. Dermatol. Venereol. **110** (1983) 703–704. (in French)

Depuis 1970, la rifampicine est utilisée dans le traitement de la lèpre multi-bacillaire. Certains patients ont reçu, parfois pendant plusieurs années, de la rifampicine seule, soit qu'elle ait été prescrite, à tort, en monothérapie, soit qu'elle ait été associée à un médicament auquel les patients étaient déjà résistants, cette résistance n'ayant pas été correctement évaluée. Dans ces conditions, on pouvait s'attendre à l'apparition de résistances à la rifampicine. Quelques cas en ont déjà été rapportés. Nous présentons ici deux observations de rechutes lépromateuses par rifampicino-résistance.—(*From* the article)

Department of Leprology, Institute of Dermatology, Chinese Academy of Medical Sciences. Urine test for monitoring regular self-administration of dapsone and its application. Chin. J. Clin. Dermatol. **13** (1984) 12–14. (in Chinese)

The ratios of dapsone to creatinine (D/C) concentrations were determined on urine samples collected from the inpatients of the leprosaria in Tai county and Xinghua county, China, in comparison with those from controls given the same daily doses of dapsone (DDS) under strict supervision and from subjects not taking dapsone. The results in 174 inpatients showed that only about 55% of their prescribed dapsone doses had been taken within 24 hr before the urine samples were collected. Among them, 103 cases (59.1%) took their prescribed dapsone doses regularly; 46 cases (26.42%), irregularly; and 25 cases (14.3%), very irregularly. The proportions of prescribed dapsone taken by these three groups cal-

culated from their mean D/C ratios were about 85.7%, 14.8%, and 1.7%, respectively.—Authors' English Abstract

Department of Leprology, Institute of Dermatology, Chinese Academy of Medical Sciences, *et al.* Toxicity of prothiomide plus rifampicin (or isobutylpiperazinyl rifamycin) and dapsone in the treatment of multibacillary leprosy. Chin. J. Dermatol. **17** (1984) 81–84. (in Chinese)

The toxicity of prothiomide (PTH) + rifampin (RMP) + dapsone and PTH + isobutylpiperazinyl rifamycin (R761) + dapsone (treatment groups) in the treatment of multibacillary leprosy were compared with the corresponding control groups that did not include PTH. The duration of treatment was 6 months. The results showed that the toxicity of the treatment groups with PTH increased remarkably, and was significantly different in comparison with the corresponding control groups without PTH. The main toxic side effect was liver damage. One patient died of acute yellow atrophy of the liver in the treatment group (PTH + RMP + dapsone) at the end of 6 months of treatment. The results indicated that the increase of toxicity of the treatment groups was related to PTH. So, PTH in combination with RMP (or R761) and dapsone should not be recommended for the treatment of multibacillary leprosy in our country (China).—Authors' English Abstract

Grosset, J. Progres dans la chimiotherapie de la lèpre. [Advances in leprosy chemotherapy.] Med. Trop. (Mars.) **44** (1984) 17–22. (in French)

The chemotherapy of multibacillary leprosy with dapsone alone has resulted after 15–20 years in the selection and the diffusion of dapsone-resistant *Mycobacterium leprae.* To overcome dapsone resistance, to prevent the selection of organisms resistant to other drugs, and to kill the largest proportion of sensitive *M. leprae,* the chemotherapy of leprosy must rely, as chemotherapy of tuberculosis, upon the combination of several drugs. Rifampin is included in all drug combinations recommended by WHO. The drug combinations have to be given for at least 6 months in patients with paucibacillary leprosy and 2 years in patients with multibacillary leprosy.—Author's English Summary

Hooper, M. and Purohit, M. G. The chemotherapy of leprosy. In: *Progress in Medicinal Chemistry,* Vol. 20. Ellis, G. P. and West, G. B., eds. New York: Elsevier Science Publishers, 1983, 1–81. (345 references)

This review presents a critical assessment of the chemotherapy of leprosy referring to both ancient and more recent drugs. In the light of the growing understanding of *Mycobacterium leprae* and the disease of leprosy, suggestions are made about possible ways new drugs might be developed. However, the chemotherapy of leprosy cannot sensibly be discussed without first presenting a brief summary of the major features of the disease.—(*From* the Introduction)

Ji, B., Chen, J., Wang, C. and Xia, G. Hepatotoxicity of combined therapy with rifampicin and daily prothionamide for leprosy. Lepr. Rev. **55** (1984) 283–289.

Liver injury was observed in 56% of 39 leprosy patients treated with combinations of dapsone, prothionamide (PTH), and isopiperazinylrifamycin SV in Hai-an, and in 22% of 50 patients treated with a combination of dapsone, rifampin (RMP), PTH and clofazimine in Shanghai. Fatalities occurred among both groups of patients after 3 or 4 months of combined chemotherapy. The drug responsible for liver injury was probably PTH, although RMP administered simultaneously may have been a contributing factor. It appears necessary to examine liver function monthly during the first 6 months of treatment by a combined drug regimen that includes PTH.—Authors' Summary

Jopling, W. H., Ridley, M. J., Bonnici, E. and Depasquale, G. A follow-up investigation of the Malta Project. Lepr. Rev. **55** (1984) 247–253.

A report is presented of a follow-up examination of 116 multibacillary leprosy patients who had received multidrug therapy (MDT) as part of a leprosy eradication pro-

gram known as the Malta Project, inaugurated in 1972. Length of treatment varied between 5 and 89 months, and side effects were mostly mild. No signs of clinical relapse were found at follow up, and 36 patients had positive skin smears; 26 had granular bacilli alone, and 10 had scanty "solids." It is proposed that these "solids" are "persisters," and their significance will be known after long-term follow up of these 10 patients.—Authors' Summary

Kelly, J. W., Scott, J., Sandland, M., Van der Weyden, M. B. and Marks, R. Vitamin E and dapsone-induced hemolysis. Arch. Dermatol. **120** (1984) 1582–1584.

Sixteen patients, each receiving 100 mg of dapsone per day, were studied for evidence of hemolysis. Vitamin E (*dl*-alpha tocopherol acetate), 800 mg/day, was then administered for up to 3 months, and dapsone therapy was continued at the same dose. Hemolysis factors were reexamined immediately prior to cessation of vitamin E therapy. No substantial change was demonstrable for levels of hemoglobin, reticulocyte count, and haptoglobin at the end of vitamin E therapy, despite a significant rise in serum vitamin E levels. Erythrocyte survival measured in 4 patients before and at the end of vitamin E therapy also showed no substantial change. Erythrocyte Heinz body count, however, fell in 9 of 15 patients studied, and none showed an increase in this measurement while receiving vitamin E. We conclude that in patients receiving dapsone at 100 mg/day, vitamin E therapy at 800 mg/day does not substantially ameliorate the hemolytic effect of this drug.—Authors' Abstract

Marsili, L., Franceschi, G., Ballabio, M., Vioglio, S., Vigevani, A., Ungheri, D., Della Bruna, C. and Sanfilippo, A. Novel rifamycins. IV. 3-Aminomethylazinomethylrifamycins, a new class of rifamycins, endowed with remarkable antibacterial activity. J. Antibiot. **37** (1984) 1209–1212.

The synthesis and the biological activities of new compounds endowed with favorable pharmacokinetic behavior are described. In particular, one compound has been chosen for further investigation.—Authors' Abstract

Nielsen, H. and Bennike, T. Thalidomide enhances defective monocyte function in lepromatous leprosy. (Letter) Lancet **2** (1984) 98–99.

Erythema nodosum leprosum (ENL) is a frequent complication of therapy for leprosy. Thalidomide is the treatment of choice in ENL, but its mechanism of action is unknown. Since mononuclear phagocytes are crucial to host defense against intracellular pathogens and since ENL can be associated with a reduction in the immune control of the mycobacterial challenge in lepromatous leprosy, we investigated monocyte function in a patient with ENL during thalidomide therapy.

Little is known about the mechanism of action of thalidomide in ENL. This case report and the *in vitro* results suggest that normalization of defective macrophage function could be in part responsible. There may be a role for thalidomide in the treatment of conditions with phagocytic dysfunction, in which no medical therapy so far has been successful.—(*From* the Letter)

Pitchenik, A. E. Monitoring compliance with anti-tuberculosis therapy. (Letter) N. Engl. J. Med. **311** (1984) 799.

To meet the problem of poor compliance with chemotherapy, the author proposes that a corps of former patients with tuberculosis (the ones who were models of compliance with drug therapy) be carefully selected, indoctrinated, educated, and recruited (as "barefoot doctors" are in China and as Alcoholics Anonymous cohorts are in the United States) to help administer fully supervised short-course chemotherapy. They could locate noncompliant patients in their area, determine reasons for the noncompliance, educate the patient (offering their own testimonials on a peer level), and help to supervise their drug therapy. They should be rewarded with certificates of achievement or money or both for each noncompliant patient whom they personally follow to a bacteriologic cure. Controlled studies should be conducted to determine how effectively such a program might affect out-

comes in the millions of patients with tuberculosis in developing countries who abandon therapy and for whom there is no follow up.—(*From* the Letter)

Samuel, N. M., Samuel, S., Nakami, N. and Murmu, R. Multidrug treatment of leprosy—practical application in Nepal. Lepr. Rev. **55** (1984) 265–272.

In June 1981, 25 years after its first involvement in the treatment and control of leprosy, the Anandaban Hospital in Nepal introduced multiple-drug therapy. The main objectives were: 1) to treat all newly diagnosed patients, both paucibacillary and multibacillary; 2) to give multiple-drug therapy to all active multibacillary cases, irrespective of previous treatment; and 3) to document the regularity of attendance of patients, including those living at great distances from the hospital clinic. Preliminary results are reported in a group of 348 patients.—Authors' Summary

Sarojini, P. A. and Mshana, R. N. Use of colchicine in the management of erythema nodosum leprosum (ENL). (Letter) Lepr. Rev. **54** (1983) 151–153.

A report of the success of colchicine in suppressing active Arthus reaction in rabbits led the writers, who work at ALERT, Addis Ababa, to try its effect in the ENL reaction of leprosy. Ten patients with recurrent or chronic ENL were given 1.5–2.0 mg daily in divided doses with dramatic results, and a maintenance dose of 1 mg of colchicine daily prevented recurrence. The writers feel that these encouraging results warrant a controlled double-blind study.—W. H. Jopling (*From* Trop. Dis. Bull.)

Stanley, J. N. A., Kiran, K. U. and Pearson, J. M. H. The use of colchicine in the management of type 2 lepra reaction (erythema nodosum leprosum). (Letter) Lepr. Rev. **55** (1984) 317–318.

We have carried out an internally controlled outpatient trial of the use of colchicine to treat patients with severe type 2 lepra reaction. Five patients, all adult Indian men, were included; all had suffered from recurrent and often almost continuous reaction for at least 2 years prior to the trial. All were receiving dapsone 50–100 mg daily together with clofazimine 100 mg daily, and all required corticosteroids, in short repeated courses and sometimes almost continuously. One patient had received a course of thalidomide a year prior to the study. The diagnosis of type 2 lepra reaction was confirmed in all cases by biopsy of an active skin nodule during the course of the trial.

The trial covered a period of 6 months, during which dapsone and clofazimine were continued in unchanged dosage. Each patient received colchicine 2 mg daily during months 3 and 4; the first and last 2 months were control periods. Prednisolone was prescribed according to need, using the usual criteria of this center, and patients were (almost) always seen by the same physician (JNAS). The effect of the colchicine was determined by its impact on the steroid requirement.

The results of the study, showing the number of milligrams of prednisolone prescribed for each patient month by month, are shown. It is clear that colchicine had little or no effect on the steroid requirement of these patients, individually or as a group.—(*From* the Letter)

Clinical Sciences

Chen. J., *et al.* A case of type 2 leprosy reactions accompanied by purpura. Chin. J. Clin. Dermatol. **13** (1984) 30–31. (in Chinese)

A case of borderline lepromatous leprosy was reported. Type 2 leprosy reaction occurred frequently after receiving more than 1 year of antileprosy treatment. Purpura repeatedly occurred with each attack of type 2 reaction, all together 6 times within 5 months. From the clinical observations, the mechanism of type 2 reaction and the therapeutic result it showed indicated that the purpura were closely related to the type 2 reaction.—Authors' English Abstract.

Courtright, P., Green, R., Pilarski, R. and Smucny, J. A survey of the eye complications of leprosy in South Korea. Lepr. Rev. **55** (1984) 229–237.

A survey on the ocular complications of leprosy has been carried out in South Korea by members of the American Peace Corps. The results in 2925 patients examined in resettlement villages show the high incidence of ocular damage caused by the disease with over 40% of the sample having some form of eye problem. As many as 11% of the patients had visual levels of less than 20/200 in both eyes, and extrapolation of these and other figures emphasizes the magnitude of the problem in the country. The setting up of regional clinics to deal with eye complications of leprosy is recommended.—Authors' Summary

de Almeida, S. M. R., Gallo, M. E. N. and de Oliveira, N. R. Estudo dos dermatoglifos digitais em portadores de hanseníase. [Digital dermatoglyphics in leprosy.] An. Bras. Dermatol. **59** (1984) 159–162. (in Portuguese)

We studied the dermatoglyphic alterations in 100 patients belonging to various types of leprosy and we compared the individual cards of the Identification Post in Rio (IIFP) and the individual cards taken at the Souza Araújo outpatient clinic (FIOCRUZ).

From that analysis we concluded that it is possible to use this technique as a method to detect the disease before clinical signs and symptoms appear as well as a method for therapeutic evaluation.—Authors' English Summary

de Almeida Neto, E. Prova do éter em hansenologia. [Ether test in hansenology.] Hansenol. Int. **8** (1983) 46–53. (in Portuguese)

The author introduces a new diagnostic technique to test skin sensitivity in hanseniasis. Sulfuric ether boils at 35°C, i.e., practically at skin temperature. One gram of vaporized ether applied to the skin substracts 90 calories and causes a clear ice-cold sensation. By touching the cooled area with his fingertip the observer provokes a warm sensation. In hypesthetic skin that sensation of cold is diminished and in anesthetic areas there is no feeling of cold at all with this ether technique. The test is made with a small cotton ball wetted in sulfuric ether, which is lightly passed over the patient's skin. The subjective cooling sensation depends on the patient's information but sometimes it is accompanied by an objective "goose skin" aspect, which is especially useful when testing children and other noncooperative persons. The technique is quite simple and much more practical and precise than the classic warm/cold tubes. It permits the mapping of the whole skin surface for dysesthetic areas in a few minutes. Precautions regarding the use of ether are given.—English Abstract by A. Rotberg

ffytche, T. J. The American Peace Corps Survey of the ocular complications of leprosy in South Korea: An evaluation and appraisal. Lepr. Rev. **55** (1984) 239–246.

The results of the American Peace Corps Survey of the ocular complications of leprosy in South Korea have been evaluated and compared with other surveys. Defective vision remains an important aspect of leprosy with 11% of the total number of 2925 patients examined having a visual acuity in both eyes of less than 6/60. It is hoped that the presentation of these figures will stimulate a more organized and rational approach to this difficult problem.—Author's Summary

Furukawa, F., Yoshida, H., Sekita, K., Ozaki, M., Imamura, S. and Hamashima, Y. Different mode of circulating immune complexes and anti-ssDNA antibodies in sera of lepromatous leprosy and systemic lupus erythematosus. Lepr. Rev. **55** (1984) 291–299.

Circulating immune complexes (CIC) and anti-ssDNA antibody were detected in sera of the patients with lepromatous leprosy (LL) and systemic lupus erythematosus (SLE). There was a markedly quantitative difference in the level of CIC and anti-ssDNA antibody between LL and SLE. A quantitative correlation study showed a lack of association between these 2 serological tests in LL but a significant association in SLE.

In addition, ssDNA was not demonstrable in CIC of LL.

These findings suggest that the mode of the appearance of these serological abnormalities in LL was completely different from that in autoimmune disease like SLE, and might be the result of polyclonal B cell activation whose causative factors seemed to be different from those of SLE.—Authors' Summary

Ramalho, A. S., Pinto, W., Jr., Magna, L. A. and Beiguelman, B. Talassemia e hanseniase. [Thalassemia and hanseniasis.] Hansenol. Int. **8** (1983) 61–65. (in Portuguese)

The β-thalassemia trait was investigated among 165 Brazilians who were unmixed Italian descendants (80 Virchowian patients and 85 normal controls composed of university students). The frequency of the β-thalassemia trait was 6.25% among the Virchowian patients and 5.88% in the control group. In spite of the similar geographical distribution of both hanseniasis and the gene for β-thalassemia in Asia, the present data does not support the hypothesis that hanseniasis might have contributed to maintain high prevalence of this allele by selection favoring β-thalassemia trait.—Authors' English Summary

Sultan Sheriff, D. Endocrine profile and seminal plasma composition in Hansen's disease. Trans. R. Soc. Trop. Med. Hyg. **78** (1984) 311–313.

Endocrine profile and seminal plasma composition in 45 patients with tuberculoid-type Hansen's disease are reported. There was marked reduction in sperm count and motility with an increase in abnormal forms of spermatozoa. The levels of serum prolactin and estradiol-17β were increased significantly with a marked reduction in serum FSH, LH, and testosterone. The possible significance of these findings may help further to understand male reproductive function in Hansen's disease.—Author's Summary

Weshler, Z. and Sheskin, J. Hanseniasis y cancer. [Hanseniasis and cancer.] Hansenol. Int. **8** (1983) 18–21. (in Spanish)

The number of patients treated for hanseniasis and cancer in Israel is not sufficient for a statistical analysis. A general conclusion about the incidence of cancer in hanseniasis patients has not been reached. The data presented may be perhaps useful for a comparison with those of other researchers interested in the subject.—English Abstract by A. Rotberg

Immuno-Pathology

Bach, M. A. and Hoffenbach, A. A monoclonal antibody against *Mycobacterium lepraemurium* which recognizes a cross-reacting mycobacterial antigen. Ann. Immunol. (Paris) **134C** (1983) 301–309.

Spleen cells from BALB/c mice infected 2 weeks earlier with *Mycobacterium lepraemurium* were fused with myeloma cells, and, using an indirect immunofluorescence assay, a hybridoma was selected which secreted an anti-*M. lepraemurium* IgM antibody. In the same assay, this monoclonal antibody also recognized 17 other species of *Mycobacteria* (including *M. leprae*) and two strains of *Nocardia*.—AS/A. D. M. Bryceson (*From* Trop. Dis. Bull.)

Boddingius, J. Ultrastructural and histophysiological studies on the blood-nerve barrier and perineurial barrier in leprosy neuropathy. Acta Neuropathol. (Berl.) **64** (1984) 282–296.

The onset and nature of ultrastructural changes in endoneurial vasa nervorum during the pathogenesis of leprosy neuropathy and possibly associated alterations in the "blood-nerve barrier" were investigated, together with perineurial barrier functioning, in mice infected 20–28 months previously with *Mycobacterium leprae* and in (ageing) non-infected mice. Barriers were tested by i.v. administration of markers (Trypan blue and ferritin) 1–4 days before killing the mice.

Twenty-eight months after infection, the histopathology of sciatic nerves was com-

parable to that seen in sensory nerves in clinically early human (borderline) lepromatous leprosy. Schwann cells and endoneurial macrophages were bacillated, endothelia of endoneurial vessels not, and the perineurium rarely.

Many infected mice and all (ageing) controls possessed ultrastructurally and functionally normal endoneurial vessels. Their continuous endothelium with close junctions had prevented marker passage, even when surrounding endoneurial tissue cells were quite heavily bacillated. The perineurium was also normal.

By contrast, in infected mice showing hind limb paralysis serious histopathologic involvement and large globi of bacilli intrafascicularly in sciatic nerves were seen; endoneurial blood vessels were abnormal. Open endothelial junctions, extreme attenuation, fenestrations, and luminal protrusions were all features comparable to neural microangiopathy encountered in leprosy patients. The "blood-nerve barrier" clearly had become defective allowing excessive exudation of Trypan blue and ferritin, via 4 pathways from the vessel lumen, deep into surrounding endoneurial tissues but halted by a normal perineurial barrier. Markers in such "blue" nerves were not found in bacillated or nonbacillated Schwann cells, thus denying significant phagocytotic and lysosomal activities of Schwann cells at this stage of neuropathy. Possible implications of barrier performances for antileprosy drug treatment of patients are discussed.—Author's Summary

Brett, S. J., Lowe, C., Payne, S. N. and Draper, P. Phenolic glycolipid 1 of *Mycobacterium leprae* causes nonspecific inflammation but has no effect on cell-mediated responses in mice. Infect. Immun. **46** (1984) 802–808.

The involvement of the phenolic glycolipid from *Mycobacterium leprae* in cell-mediated immunity has been investigated in this study. The phenolic glycolipid itself does not appear to stimulate cell-mediated immunity directly, as shown by its failure to elicit a classical delayed-type hypersensitivity response in mice immunized with *M. leprae* or to stimulate *M. leprae*-immune lymph node cells in a lymphoproliferative assay. Intradermal vaccination with the phenolic glycolipid failed to influence the growth of *M. leprae* in mouse foot pads. A nonspecific inflammatory response to the sonicated glycolipid was observed in mice vaccinated with whole *M. leprae* and in control animals. No evidence was obtained for any adjuvant or suppressive effect on cell-mediated immunity by the phenolic glycolipid either to *M. leprae* or to an unrelated antigen (sheep erythrocytes); neither sensitization nor elicitation to either antigen was affected.—Authors' Abstract

Cassou, M., Wendling, D. and Guidet, M. Vascularite avec cryoglobulinémie mixte révélatrice d'une lèpre. A propos d'un cas. [Vaculitis with mixed cryoglobulinemia revealing leprosy. A pertinent case.] Rev. Rhumatisme **51** (1984) 109–111. (in French)

Les auteurs rapportent une observation de lèpre lépromateuse révélée par une vascularite lymphocytique avec cryoglobulinémie mixte. Ils rappellent les troubles immunitaires rencontrés dans cette affection, troubles qui semblent à l'origine de certaines manifestations de la maladie.—Author's Summary

Cho, S. N., Fujiwara, T., Hunter, S. W., Rea, T. H., Gelber, R. H. and Brennan, P. J. Use of an artificial antigen containing the 3,6-di-*O*-methyl-β-D-glucopyranosyl epitope for the serodiagnosis of leprosy. J. Infect. Dis. **150** (1984) 311–322.

The coupling of synthetic 3,6-di-*O*-methyl-β-D-glucopyranosyl-(1→4)-2,3-di-*O*-methyl-α-L-rhamnopyranose, the hapten determinant of phenolic glycolipid-I from *Mycobacterium leprae,* to bovine serum albumin (BSA) by reductive amination produced the antigen ε-*N*-1-[1-deoxy-2,3-di-*O*-methyl-4-*O*-(3′,6′-di-*O*-methyl-β-D-glucopyranosyl)-rhamnitol]-lysyl-BSA, which proved highly sensitive in ELISA and showed good concordance with the native glycolipid in analysis of serum samples from 223 leprosy patients. Conjugates prepared from 6-*O*-methyl-β-D-glucopyranosyl- or β-D-glucopyranosyl-containing disaccharides were inactive and those containing noncyclic 3,6-di-*O*-methyl-glucitol showed lit-

tle activity. Thus, 3,6-di-*O*-methyl-β-D-glucopyranose in its cyclic hemiacetal form is necessary for binding anti-glycolipid IgM from leprosy patients. Analysis of serum samples from healthy subjects showed a false-positive rate of 2.4% (4 of 169) against the glycolipid and 3.6% (6 of 169) against the glycoconjugate. Comparable figures for samples of sera of tuberculosis patients were 3.0% (2 of 66) and 9.0% (6 of 66), respectively. Alternative synthesizing strategies may diminish this crossreactivity. The prospects of a fully synthetic specific antigen for the worldwide serodiagnosis of leprosy look promising.—Authors' Abstract

Eshchanov, T. B. Results of clinico-allergological examinations of patients with leprosy. Vestn. Dermatol. Venerol. **11** (1983) 15–18. (in Russian)

Allergo-immunological examinations of patients with leprosy were carried out and showed that the immunological status of patients with leprosy, particularly of those with a severe lepromatous type of the disease, was characterized by suppression of the T cell system of immunity and slight stimulation of the function of B lymphocytes. Patients with leprosy show decreased responsiveness to histamine and noninfectious allergens and increased responsiveness to the majority of infectious allergens. Erythema nodosum leprosum is a frequent complication in the lepromatous type of leprosy.—Author's English Summary

Ferluga, J., Colizzi, V., Ferrante, A., Colston, M. J. and Holborow, E. J. Hypothesis: Possible idiotypic suppression of cell-mediated immunity in lepromatous leprosy. Lepr. Rev. **55** (1984) 221–227.

It is suggested that lepromatous leprosy may develop as a result of chronic suppression of specific cellular immunity by anti-idiotypic (Id) antibodies and Id-restricted suppressor lymphocytes. This potential immuno-tolerizing mechanism would probably be initiated most effectively in early life. Auto-anti-Id responses may be induced by exposure to *Mycobacterium leprae* antigens, or maternal anti-Id antibodies may be acquired transplacentally. The anti-Id antibodies would be directed against a predominant self-antigenic idiotype located on immuno-recognition molecules for *M. leprae* antigens on lymphocyte membranes. Together with certain HLA-self-antigens such Id-anti-Id responses would determine the susceptibility to leprosy.—Authors' Summary

Fliess, E. L., Ortiz, M. C. and Corn, J. Alteración de la inmunidad mediada por células frente a *Mycobacterium leprae* y *Mycobacterium marinum* en pacientes hansenianos. [Alterations in cell-mediated immunity to *Mycobacterium leprae* and *M. marinum* in hanseniasis patients.] Hansenol. Int. **8** (1983) 9–17. (in Spanish)

Cell-mediated immunity (CMI) to protein purified derivates of *Mycobacterium leprae, M. tuberculosis, M. avium,* and *M. marinum* was studied. Leukocyte migration inhibition (LMI) and delayed hypersensitivity skin reactions to these antigens were examined in 44 hanseniasis patients (20 quiescent Virchowians, 13 reactional Virchowians, and 11 tuberculoid patients) and 15 healthy subjects. An impairment in LMI and delayed hypersensitivity tests to *M. leprae* and *M. marinum* was observed in Virchowian patients, both quiescent and reactional. The CMI response to all mycobacterial antigens was increased in tuberculoid patients and there was observed a poor response to *M. leprae* and *M. marinum* in healthy controls. Our results showed a high correlation between the CMI response to *M. leprae* and to *M. marinum* ($r = +0.8$). This close relationship between both antigens may be an expression of cross-reactivity.—Authors' English Abstract

Freire-Maia, D. V. Análise familial do comportomento *in vitro* dos macrófagos humanos frente ao *Mycobacterium leprae.* [Familial analysis of the *in vitro* behavior of human macrophages towards *Mycobacterium leprae.*] Hansenol. Int. **8** (1983) 91–100. (in Portuguese)

The lysogenic capacity of human macrophages facing *Mycobacterium leprae in vitro* may be dependent on an important genetic component. Although the family aggregation of the trait is demonstrated, this is a necessary but not sufficient condition to prove genetic influence. The data do not fit some simple genetic models (autosomal

dominant or incompletely dominant gene; dominant or recessive sex-linked gene). The results obtained are consistent with the hypothesis that the macrophages' lysogenic capacity is mainly due to a major gene with variable expressivity. This hypothesis may be too simple to account for the whole variability detected and therefore must be considered just as a working hypothesis.—Author's English Abstract

Freire-Maia, D. V. Comportamento *in vitro* frente ao *Mycobacterium leprae* dos macrófagos de pessoas sadias e de pacientes com hanseníase. [The *in vitro* behavior of macrophages from healthy controls and from hanseniasis patients against *Mycobacterium leprae.*] Hansenol. Int. **8** (1983) 81–90. (in Portuguese)

The *in vitro* phagocytic capacity of human macrophages facing *Mycobacterium leprae* was analyzed in a selected sample of healthy and hanseniasis patients (Virchowian and tuberculoid) individuals. Families where at least one of the spouses presented Hansen's disease were selected and 176 white people were studied. The analysis of the macrophages' behavior was performed by reading the slides on the 5th, 10th, 15th, 20th and 30th day after inoculation with *M. leprae.* The classification is discussed. The results showed a high variability. The main conclusions reached are: a) people differ in their capacity to lyse *M. leprae,* as measured by their macrophages' behavior *in vitro*; b) the results obtained give support to Beiguelman's theory of the lysis threshold.—Author's English Summary

Godal, T. Leprosy. In: *Bacterial Vaccines.* Germanier, R. E., ed. Orlando: Academic Press, 1984, 419–430.

No vaccine against leprosy is currently available. This is an area of active ongoing research primarily carried out under the auspices of the World Health Organization. Leprosy has many unique features with regard to pathogenesis, immunology, epidemiology, and therapy that warrant discussion in relationship to vaccine development. In addition, the current status of vaccine development and plans for future clinical trials are described.—(*From* the Chapter)

Haregewoin, A., Mustafa, A. S., Helle, I., Waters, M. F. R., Leiker, D. K. and Godal, T. Reversal by interleukin-2 of the T cell unresponsiveness of lepromatous leprosy to *Mycobacterium leprae.* Immunol. Rev. **80** (1984) 77–86.

In some subjects *Mycobacterium leprae* causes disseminated (lepromatous) disease. Such subjects show both *in vivo* and *in vitro* deficient T cell responses to *M. leprae,* but not to other antigens. We have recently shown that lepromatous peripheral blood mononuclear cells (PBMC) failed to produce interleukin 2 (IL2) in response to *M. leprae* and that T cell-conditioned media (TCM) can reverse the T cell unresponsiveness in a majority of lepromatous leprosy patients. Here we show that highly purified and recombinant IL2 had effects similar to TCM. On the other hand, lepromatous PBMC produced IL1, and IL1 had no restorative effect. These findings provide further evidence that the unresponsiveness in lepromatous leprosy often results from a deficiency in IL2 production. After initial stimulation with TCM + *M. leprae,* lepromatous PBMC could be restimulated with *M. leprae* alone, providing clear evidence that *M. leprae*-reactive lymphocytes were generated in the presence of TCM.

The present findings are discussed in relation to the possible mechanisms involved in the failure of IL2 production. If our findings can be reproduced *in vivo,* IL2 may offer a novel approach to therapy in lepromatous leprosy.—Authors' Summary

Ji, Z., *et al.* Electron microscopic study on peripheral nerve lesions in tuberculoid leprosy. Chin. J. Dermatol. **17** (1984) 85–87. (in Chinese)

Ultrastructural changes in peripheral nerve biopsies from 5 cases of tuberculoid leprosy, including 3 cases of active stage and 2 cases of regressive stage, were studied. Under electron microscopy, the nerve parenchyma from the active stage was almost destroyed and replaced by epithelioid cells, lymphocytes, macrophages, and fibroblasts. Still some unmyelinated and demyelinated nerve fibers with intact or degenerated axons were seen among these cells. Occasionally polymorphonuclear leukocytes, more or less collagen fibrils, along with the changes in capillary walls were also found. Both in-

tact and degenerated *Mycobacterium leprae* could be seen in the cytoplasm of macrophages only after careful search. The predominant feature of nerves from the regressive stage was degenerated epithelioid cells, increasing number of lymphocytes, and abundant formation of collagen fibrils. The pathogenesis of the lesions, the invasion route of *M. leprae* to the peripheral nerve are also discussed. The significance of the appearance of the polymorphonuclear leukocytes and collagen fibrils in the lesions of active stage are also elucidated.—Authors' English Abstract

Khande, L., Penumarti, N. and Mahadevan, P. R. Phosphatidyl inosito mannosides in lepromatous leprosy nodules. Indian J. Med. Res. **80** (1984) 259–263.

Analysis of lipids of skin infected with *Mycobacterium leprae,* obtained from lepromatous leprosy patients, showed changes in lipid composition as compared to the skin from normal individuals. The infected skin had several *M. leprae*-specific lipids and also showed higher amounts of phospholipids and glycolipids. The mannosides, as part of the total phospholipids, were also important constituents of the infected skin. Six distinct phosphatidyl inosito mannosides (PIMs) were identified in the infected tissue, which were absent in the skin from normal persons. Among these 6, a triacyl dimannoside (PIM_2-3F) was quantitatively most prominent. The significance of these PIMs in infected tissue has been brought out in relation to *M. leprae* infection.—Authors' Abstract

Kliemann, T. A. E., Martinez, E. L. W., Irulegui, I., de Souza, Z. W. T. and Cavalcanti, Z. M. de O. Conversion of the C3 component of complement in sera of hanseniasis patients. Hansenol. Int. **8** (1983) 5–8.

The levels of total C3 (native C3 plus its degradation products) and the degree of conversion of native C3 into its breakdown products were studied in sera of virchowian (V), tuberculoid (T), indeterminate (I), and virchowian with erythema nodosum hansenicum (ENH) patients. Sera from normal individuals (N) were also analyzed. While the levels of total C3 were not significantly different among the groups, the percentage of conversion of C3 into its degradation products was significantly higher in V and ENH sera. The activation of the complement system and the involvement of immune complexes are discussed.—Authors' Abstract

Liu, L., *et al.* Further observation on histoid leproma by TEM and SEM. Chin. J. Dermatol. **17** (1984) 188–190. (in Chinese)

In this article, 5 cases of histoid leproma (HL) occurring in different conditions of leprosy were studied by TEM in connection with clinical manifestation and histopathological picture. Two of them were examined by SEM. The results were as follows:

The cellular components of HL were similar to those being described formerly, including 4 types of macrophages (i.e., ordinary, fusiform, epithelioid, and foamy macrophages). They were more typical in the lesions which were less than half a year old, consisting predominantly of fusiform macrophages. Their proliferation was remarkable. Leprosy bacilli were largely of solid form. Some of them were in cross division. Therefore it was supposed that the pathogenesis of HL was closely related to the rapid multiplication of *Mycobacterium leprae.* However, the typical feature of HL remained for a certain period only. In the lesions which lasted over 1 year, many foamy macrophages and disintegrated bacilli appeared. These bacilli were also found in lysosomes, and cellular proliferation was less remarkable. The reason for this feature is discussed.

No significant ultrastructural differences were found between HL occurring in BL and LL, in DDS-resistant and nonresistant cases, or between HL in early and relapsed cases. The ultrastructure of the bacilli in the DDS-resistant case studied by SEM and TEM was similar to that in the non-resistant one.—Authors' English Abstract

Michalany, J., Michalany, N. S. and Petri, V. Reação de Mitsuda e seu antígeno. [The Mitsuda reaction and its antigen.] Hansenol. Int. **8** (1983) 140–147. (in Portuguese)

Some references of the history of the Mitsuda reaction and its antigen, as well as for

the results and significance of this unique reaction are presented. In spite of the great advances of modern immunology, the Mitsuda reaction is still the best method for the diagnosis of the forms of hanseniasis and for the prognosis of the disease in patients and in healthy persons.—Authors' English Abstract

Michalany, N. S. and Michalany, J. Histopatologia de reação de Mitsuda em adultos sadios não comunicantes de hansenianos. [Histopathology of the Mitsuda reaction in healthy adults who are not contacts of hanseniasis patients.] Hansenol. Int. **8** (1983) 105–123. (in Portuguese)

A detailed study on the histopathology of Mitsuda's reaction was made in 100 adult noncontact hanseniasis patients inoculated with lepromin A (armadillo). It was found that the histological structure of Mitsuda's reaction with lepromin A does not differ from the one observed with lepromin H. There is also no difference between the histological picture observed in healthy noncontacts and the one found in tuberculoid patients and in healthy contact persons. Mitsuda's reaction in noncontact hanseniasis patients presented variations of histological degree—Classes 0 (−), I (±), II (+), III (++), IV (+++)—from no inflammatory reaction and positive bacilli, until formation of a complete tuberculoid granuloma and absence of bacilli. In 97% of the cases the reaction was positive. Class III, i.e., represented by incomplete tuberculoid granuloma formed by epithelioid cells with follicular arrangement and lymphocytic halo, predominated in the series (42%). The findings of this research state, once again, that an efficient result of the Mitsuda reaction depends fundamentally of the histological examination, since in only 16 cases the clinical reading coincided with histopathology. Discordance found in the remaining 84 cases was attributed to the secondary alterations (necrosis and suppuration) associated with the granulomatous reaction of the positive test. These findings also state that the histological structure of the Mitsuda reaction follows the Jadassohn-Lewandowsky law and are in accordance with the morphological concept and classification of polar granulomas proposed by Michalany and Michalany.—Authors' English Abstract

Morton, A., Nye, P., Rook, G. A. W., Samuel, N. and Stanford, J. L. A further investigation of skin-test responsiveness and suppression in leprosy patients and healthy school children in Nepal. Lepr. Rev. **55** (1984) 273–281.

The paper confirms and extends our previous studies of skin-test responsiveness and suppression in Nepal. The ability of leprosy patients to make positive responses to group i and group ii (common mycobacterial, and slow-grower associated) antigens is markedly impaired in comparison with healthy school children. Of the 2 suppressor mechanisms associated with mixtures of reagents prepared from fast and slow growers which were demonstrated in Bombay, only the phenomenon of local suppression previously seen in Nepal was found. Although originally thought to be associated with group iv (species-specific) antigens of fast growers, the phenomenon occurred whichever reagent of 9 fast-growing species was mixed with the slow-grower reagent. Thus, our present view is that the phenomenon demonstrable in both Bombay and Nepal is related to the presence of antigen common to any fast-growing species. The observation of this suppressor mechanism in leprosy patients, leprosarium staff, and healthy school children shows that it is unlikely to be related to the disease, although it may be related to susceptibility to it.

Our inability to demonstrate in Nepal the distant suppressor mechanism found in Bombay suggests that this may be due to geographical differences, probably in the amount of oral contact with environmental mycobacteria, and perhaps in the species that are present.—Authors' Summary

Narayanan, R. B., Bhutani, L. K., Sharma, A. K. and Nath, I. Normal numbers of T_6 positive epidermal Langerhans' cells across the leprosy spectrum. Lepr. Rev. **55** (1984) 301–308.

Langerhans' cells (LC) in the skin lesions of 25 untreated leprosy patients were defined by indirect immunofluorescence using monoclonal antibodies against phenotypic markers T_6 and Ia-like antigens. Normal

numbers of epidermal LC were seen in leprosy lesions. No differences were observed in the intensity of fluorescence or in the numbers of T_6 + Ia + LC across the leprosy spectrum. However, the dermal granulomas of tuberculoid leprosy (TT/BT) showed a high proportion of T_6 + cells in the mononuclear infiltrate surrounding the epithelioid cells. Smaller numbers of these cells were seen in borderline leprosy (BB, BL) with a virtual absence in polar lepromatous leprosy (LL). Ia-like antigens were associated with the macrophages in BL and LL granulomas and with the lymphocytes in tuberculoid lesions. B cells were conspicuously absent in all leprosy lesions.—Authors' Summary

Olcén, P., Harboe, M., Warndorff, T. and Belehu, A. Anti-*Mycobacterium leprae* antibodies in urine from lepromatous patients examined by crossed immunoelectrophoresis and radioimmunoassay. Scand. J. Immunol. **19** (1984) 521–528.

Precipitating anti-*Mycobacterium leprae* antibodies were found in concentrated urine samples from 21 out of 42 lepromatous patients. These antibodies were directed against *M. leprae* antigens 5, 6, and 7. In a radioimmunoassay for anti-*M. leprae* antibodies, 90% of these patients had higher antibody levels in their urine than control persons. There was a positive correlation between anti-*M. leprae* antibody levels in serum and urine. The advantages of using atraumatically collected samples like urine in epidemiological work are pointed out. The present report shows that urine can be used to measure the antibody response to a specified microorganism causing infection outside the urinary tract. The possible presence of antibodies in urine should alert researchers who look for antigens in urine to choose assays that minimize interference by such antibodies.—Authors' Abstract

Ramanathan, V. D., Parkash, O., , Ramu, G., Parker, D., Curtis, J., Sengupta, U. and Turk, J. L. Isolation and analysis of circulating immune complexes in leprosy. Clin. Immunol. Immunopathol. **32** (1984) 261–268.

Circulating immune complexes (CIC) were isolated by two antigen nonspecific methods from 60 leprosy patients belonging to borderline tuberculoid (BT) and lepromatous (LL) types with and without reactions. CIC were elevated in both BT and LL reactions. CIC from BT in reaction (BTR) were found to consist largely of IgG and C3, whereas C-reactive protein could be found in CIC from LL reactions (LR). In addition, IgM and rheumatoid factor were demonstrated in the complexes of LR patients who had mainly arthritis. Antimycobacterial antibody was seen in the complexes of two thirds of LR patients who had predominantly skin manifestations as part of their reaction. The relevance of these findings to the clinical manifestations of different types of reactions is discussed.—Authors' Abstract

Salgame, P. R., Birdi, T. J., Lad, S. J., Mahadevan, P. R. and Antia, N. H. Mechanism of immunosuppression in leprosy—macrophage membrane alterations. J. Clin. Lab. Immunol. **14** (1984) 145–149.

Lepromatous leprosy macrophage lysate (L-lysate)-induced macrophage membrane alteration was studied using 3 membrane markers: 1) Fc receptor; 2) concanavalin A (ConA) receptor, and 3) *Mycobacterium leprae* adherence to macrophage membrane. The data indicate that L-lysate induces membrane perturbation of normal macrophages. The alteration can be reversed with trypsin and colchicine. The membrane alterations observed may lead to defective macrophage participation in cell-mediated immune reactions.—Authors' Summary

Watson, S. R. and Bullock, W. E. Immunoregulatory defects in leprosy. Adv. Exp. Med. Biol. **162** (1983) 203–215.

At present, the question remains whether the inability of the $T8^+$ cell population to function normally is a primary or secondary defect in LL leprosy. Notwithstanding the fact that the nature of the primary defect in leprosy remains to be elucidated, experiments such as reported here hold considerable promise for improving our under-

standing of the immunopathogenesis of hypergammaglobulinemia and autoantibody formation in leprosy.—(*From* the article)

Microbiology

Massalski, W., Kozminska-Kubarska, A. and Skukla, R. R. Trials of culturing of *Mycobacterium leprae* using media enriched with thyroid hormones. Mater. Med. Pol. **15** (1983) 13–14.

Segments of pathologically changed skin from cases with nodular leprosy were cultured on modified (without streptomycin) Sabouraud's medium, enriched with thyroid hormones. A culture of alcohol- and acid-fast bacteria and of *Blastomyces* was obtained. The methods of identification of Hansen's bacillus are discussed.—Authors' Summary

Rastogi, N., Frehel, C. and David, H. L. Cell envelope architectures of leprosy-related corynebacteria, *Mycobacterium leprae,* and related organisms: A comparative study. Curr. Microbiol. **11** (1984) 23–30.

Cell-envelope architectures of three strains of leprosy-derived corynebacteria (LDC) named Kim, FPSA, and 43LL were compared with *Mycobacterium leprae* and *M. avium* as well as with related organisms (*Nocardia asteroides* and *Corynebacterium pseudotuberculosis*). Cytochemical studies were performed at the ultrastructural level after the lead citrate, silver proteinate, acidic phosphotungstic, and ruthenium red colorations. This study showed that, while the organisms belonging to the *Corynebacterium–Mycobacterium–Nocardia* (CMN) group had only the cytoplasmic membrane but not the cell wall reacting with the silver proteinate coloration, the LDC organisms had both the cell wall and the cytoplasmic membrane reacting with this coloration method. Moreover, the three strains of the LDC organisms differed from one another at the level of their exopolymer content. *M. leprae,* on the other hand, gave a cytochemical response common to other mycobacteria and the members of the CMN group studied. Consequently, the envelopes of the LDC organisms were not identical to *M. leprae,* neither morphologically nor cytochemically.—Authors' Abstract

Wu, Q., *et al.* Study in cultivation of *M. leprae in vitro*: II. Characteristics of 21 strains of acid-fast bacilli studied by means of 12 differential identification tests. Chin. J. Dermatol. **17** (1984) 184–187. (in Chinese)

This paper reports the result of the characteristics of 21 of the 23 strains of acid-fast bacilli studied by means of Kubica's 12 differential identification tests for mycobacteria. These 21 strains could be divided into Group I, including 14 strains; Group II, including 4 strains; and 3 remaining strains of questionable position. The characteristics of Group I were: no growth at 45°C, optimal growth at 32°C slow growth, scotochromogenic, smooth and hemispherical colony, niacin test (−), nitrate reduction (−), catalase > 45 mm (−), Tween hydrolysis (−), tellurite reduction (−), arylsulfatase (−), catalase 68°C (+), no growth on MacConkey agar, 5% NaCl tolerance (+) (with 2 strains negative). With the exception of their growth at 45°C, the other characteristics of Group II were just the same with those of Group I. The authors considered that the strains of Group I represent a yet unreported species of mycobacterium to their knowledge, and the 4 strains of Group II may be variants of the same species. The differences of the characteristics between some strains with animal passage before cultivation are discussed. Further studies are still going on.—Authors' English Abstract

Experimental Infections

Curtis, J., Akuffo-Adu, H. and Turk, J. L. *H*-2-Linked genes which modify resistance of C57BL/10 mice to subcutaneous infection with *Mycobacterium lepraemurium*. Infect. Immun. **46** (1984) 635–638.

Strains of C57BL/10 mice with recombinants within the *H*-2 complex were used to map the genes which control the mononuclear cell response at the infection site and modify resistance to subcutaneous infection with *Mycobacterium lepraemurium*. Strains with *b* in the K–E_β regions of the *H*-2 complex mounted a more rapid cellular response in the infected foot pad and were more resistant than mice with *d* or *k* in the K–E_β regions. Significant differences between strains with *k* in the K–E_β regions appeared to be controlled by a gene in the D region.—Authors' Abstract

Graham, L. and Navalkar, R. G. Immune response in BALB/c mice following immunization with heat-killed *Mycobacterium lepraemurium*. Zentral. Bakteriol. Mikrobiol. Hyg. [A.].

BALB/c mice were immunized with 1×10^7 heat-killed *Mycobacterium lepraemurium* (Mlm) via the hind foot pad. Four weeks later, the animals were infected with 1×10^9 Mlm intraperitoneally. Skin test studies, using foot pad swelling as a parameter, indicated the development of skin reactivity to Mlm and *M. leprae* cell extracts. Immunized animals that were infected showed positive reactions to both antigens by the second week. This persisted up to 14 weeks, at which time bacillary restriction was also observed in the spleens and livers. Nonimmunized infected animals, on the other hand, showed a decline in skin reactivity to the 2 antigens used, and also showed proliferation of Mlm in the 2 organs examined. Animals receiving heat-killed Mlm or sensitized splenocytes, when challenged with 5×10^3 *M. leprae* via hind foot pad, did not show inhibition of the infecting agent, thus indicating a lack of cross-protection.—Authors' Abstract

Ha, D. K. K., Lawton, J. W. M. and Gardner, I. D. Immunosuppressive activities of peritoneal and splenic macrophages in murine leprosy: Effect on lymphocyte transformation and tumor growth. Microbiol. Immunol. **28** (1984) 793–806.

The ability of peritoneal macrophages (PM) and splenic macrophages (SM) to suppress tumor growth and lymphocyte transformation *in vitro* was studied in infected mice with *Mycobacterium lepraemurium* (MLM). Both PM and SM of leprous mice showed cytostatic activity against tumor cells *in vitro*. However, such cells showed significantly less cytostatic activity on a per cell basis than highly activated macrophages obtained from *Corynebacterium parvum*-immunized mice. Furthermore, this cytostatic activity declined as the infection progressed.

Mitogen-induced transformation of splenic lymphocytes was also suppressed in the presence of adherent PM and SM from leprous mice. PM from leprous mice showed significantly less activity than PM from *C. parvum*-immunized mice in terms of suppression of lymphocyte transformation. Moreover, PM from leprous mice treated with *C. parvum* or sodium thioglycolate broth demonstrated significantly less ability to suppress lymphocyte transformation than did PM from similarly treated normal mice or untreated leprous mice. These findings demonstrated that MLM infection stimulates the mononuclear phagocyte system but does not activate it to the extent that it confers enhanced resistance to MLM on the host.—Authors' Abstract

Rojas-Espinosa, O. Lepra murina experimental. Efecto sobre algunas enzimas presentes en el suero. [Experimental murine leprosy. Effect on some serum enzymes.] Dermatol. Rev. Mex. **27** (1983) 168–176. (in Spanish)

This paper presents the results of a study in mice infected with *Mycobacterium lepraemurium* on the levels of serum alkaline phosphatase, lactate-dehydrogenase, glutamate-oxalacetate and glutamate-pyruvate transaminases.

The murine mycobacteriosis provokes an increase in the levels of LDH and in the levels of both transaminases but does not modify the level of alkaline phosphatase. Although the increase in the LDH level is the most remarkable, the increase in the levels of GOT and GPT starts earlier and seems to correlate better with the leprosy infection.

Measurement of these enzyme activities is proposed as a means to establish, and to follow from the beginning the progress of the infection under study.—Author's English Summary

Epidemiology and Prevention

Alvarez Mesa, M., Perez Batista, C., Baez Muniz, G. and de la Solana Dumas, J. Estudio de 10 familias de la prevalencia de lepra en las áreas de salud correspondientes al hospital docente "Enrique Cabrera." [Study of 10 families of the leprosy prevalence in health areas corresponding to Enrique Cabrera Teaching Hospital.] Rev. Cub. Med. Trop. **35** (1983) 202–212. (in Spanish)

Ten families of the total leprosy prevalence in health areas assisted at the Enrique Cabrera Teaching Hospital, who presented more than one member of the family suffering the disease, are studied. Decreasing time elapsed in reporting secondary cases since the report of the index case after starting the control program for leprosy is pointed out.—Authors' English Summary

Cordero, C. F. A. Lepra en Guatemala 1982. [Leprosy in Guatemala, 1982.] Acta Leprol. **94** (1984) 19–37. (in Spanish)

Leprosy is an endemic disease in Guatemala. The author presents a brief account of the leprosy situation from the year 1527 to 1 January 1982. The rural antileprosy campaign has confirmed that the north oriental zone is the endemic area of Guatemala. Until today, there are 410 verified cases of leprosy. Among them, the predominant type is lepromatous with 49.04%; 62.43% of leprosy patients are males. As to age group, the 30–39 year olds predominate with 19.24%.—(*From* the Author's English Summary)

Fine, P. Leprosy and tuberculosis—an epidemiological comparison. Tubercle **65** (1984) 137–153.

Leprosy and tuberculosis appear to be epidemiologically similar in many ways. For example: their reliance on a respiratory portal of exit, their long and variable "incubation" periods, their propensity for subclinical infection, the variety in their clinical manifestations and transmission potential, their progressive disappearance from developed countries, their drug sensitivities, their spatial and familial clustering, their association with poverty, their stigmatizing effect in human societies and their varying "responses" to BCG. Given so many similarities, the differences between them become particularly interesting. Among these are the possibilities that their portals of entry differ, that they vary in their urban-rural propensities, and that the relationship between latitude and BCG efficacy differs between the two. It would seem worthwhile to focus specifically upon such differences, to clarify whether they are real or only apparent, in the hope that this might improve our understanding of the natural histories of these two conditions.—(*From* the article)

Hagstad, H. V. Leprosy in sub-human primates: Potential risk for transfer of *M. leprae* to humans. Int. J. Zoonoses **10** (1983) 127–131.

Twenty-six owned monkeys were examined in Andhra Pradesh, India, during the period May–July 1982. The prevalence rate among humans in daily contact with these monkeys was 98.6/1000. None of the monkeys examined had any evidence of current infection with *Mycobacterium leprae* but 6 were in daily contact with individuals who had leprosy. All 6 of these monkeys were used for begging and had daily physical con-

tact with large numbers of people, particularly children.—Author's Summary

Mesquita, A. P. A educação sanitária em hanseníase. [Sanitary education in hanseniasis.] Hansenol. Int. **8** (1983) 148–149. (in Portuguese)

The importance of sanitary education in the prophylaxis of Hansen's disease is emphasized and the educational programs concerning Hansen's disease developed only to physicians, other professionals in the medical area, patients and contacts is suggested since the people in general are not interested in these sorts of campaigns. It is also stressed that the patients that are adequately informed may become efficient collaborators in the discovery of new cases and in the prophylaxis of this disease.—Author's English Abstract

Ottenhoff, T. H. M., Gonzalez, N. M., de Vries, R. R. P., Convit, J. and van Rood, J. J. Association of HLA specificity LB-E12 (MB1, DC1, MT1) with lepromatous leprosy in a Venezuelan population. Tissue Antigens **24** (1984) 25–29.

To investigate whether an association could be found between HLA and lepromatous leprosy, a population study was performed in Tachira, Venezuela. This was done in the same endemic area in which recently both non-random parental HLA-haplotype and preferential segregation of the HLA specificity LB-E12 (MB1, DC1, MT1) was demonstrated in lepromatous leprosy patients from multicase families. In this study 32 lepromatous patients and 32 healthy controls were typed for HLA-A, -B, -C, -DR, and the specificities MB and MT. The frequency of LB-E12 (MB1, DC1, MT1) showed a significant increase in lepromatous leprosy patients ($p = 0.04$). This is the first report concerning HLA and leprosy which confirms in the same endemic area an association observed in families on the population level.—Authors' Abstract

Reddy, B. N. and Bansal, R. D. An epidemiological study of leprosy among children in a rural area. Indian J. Pediat. **50** (1983) 497–501.

Children numbering 2095 residing in 6 leprosy endemic villages of Pondicherry Union Territory were examined for evidence of leprosy by going door to door. The prevalence of leprosy among children was 32.46/1000. Sex specific prevalence rates were 29.40 and 35.58/1000 for boys and girls, respectively. Harijan children showed the highest prevalence rate of 53.73/1000. Only 25.9% gave the history of contact. The type-specific prevalence rates were found to be 7.63/1000 for indeterminate leprosy, 23.38/1000 for tuberculoid leprosy, and 1.43/1000 for borderline leprosy. Single skin lesion was the commonest presenting symptom and was seen in 67.65% of the cases. Leprosy disability rate was 1.47%.—Authors' Abstract

Other Mycobacterial Diseases and Related Entities

Aronson, I. K., Yu, R., West, D. P., Van Den Broek, H. and Antel, J. Thalidomide-induced peripheral neuropathy. Arch. Dermatol. **120** (1984) 1466–1470.

Sensory neuropathies developed in 3 of 4 patients with prurigo nodularis who had been treated with thalidomide. The serum samples of the patients who had neuropathy produced morphologic changes in cultured dorsal root ganglion cells. These observed changes support the postulate that thalidomide induces primary neuronal degeneration.—Authors' Abstract

Berger, T. G. Leprosy and leishmaniasis. J. Assn. Mil. Dermatol. **10** (1984) 44–51.

Leprosy and leishmaniasis are tropical diseases whose clinical manifestations reflect an interaction between the host's cell-mediated immunity and the infectiousness of the parasite. In leprosy, the host immunologic response appears to be the major determinant of disease course. In leishmaniasis, on the other hand, the infecting parasite plays an important role in disease outcome.

The goal of research in these diseases is

to identify the host and parasite characteristics that will define those at risk for clinical leprosy (especially lepromatous leprosy), mucocutaneous leishmaniasis, and disseminated cutaneous leishmaniasis, so that appropriate prophylactic measures can be taken.—Author's Summary

Castets, M., Festou, P., Pineau, P. and Agius, C. An enzyme immunoassay for studying humoral immunity to tuberculosis. Med. Afrique Noire **30** (1983) 21–27.

The long but unrewarding search for a serological test for tuberculosis is briefly referred to. Encouraged by recent promising results obtained with enzyme-linked immunosorbent assay (ELISA), the authors introduced a simple version of the test using whole BCG as the antigen and with the minimum of equipment. Antibodies in the IgG and IgM classes were quantitated in sera from 100 patients with tuberculosis and 47 healthy control subjects. There was a large overlap of antibody concentrations in the IgG class between patients and controls, only 35% of the patients had concentrations above the range found in the controls. The IgM levels were even less discriminatory, with only 10% of patients having elevated concentrations of antibody in this class. [This study well illustrates the problem encountered in all attempts to develop a serodiagnostic test for tuberculosis; namely the presence of antimycobacterial antibodies in healthy subjects, and an unacceptably high number of tuberculous patients with antibody levels within this "normal" range.]—J. M. Grange (*From* Trop. Dis. Bull.)

Collins, F. M. and Auclair, L. K. Effect of *Mycobacterium bovis* (BCG) infection on the kinetics of the mononuclear cell response within the lung. J. Leukocyte Biol. **36** (1984) 321–332.

Specific pathogen-free LBN rats were parabiotically linked and the monocyte donor animal was labeled with multiple pulses of tritiated thymidine (1 μCi/g body weight). The right-hand (recipient) rat lungs were infected with 10^5 viable *Mycobacterium bovis* (BCG) Pasteur by the intravenous, aerogenic, or intratracheal routes. Control animals received heat-killed BCG or saline only, given intratracheally. The BCG infection resulted in a tenfold increase in the number of heavily labeled, blood-derived monocytes recovered 24 hr later in the lung lavage fluid. The percentage of labeled cells peaked on day 3 and then declined slowly. Introduction of heat-killed BCG into the lung produced a smaller mononuclear cell influx but a marked polymorphonuclear phagocyte response that persisted for several days. The labeled monocyte counts for the infected recipient rat lung washouts were 5 to 10 times those for the uninfected donor parabiont, except when the aerogenic infection route was used, when both donor and recipient rats were equally infected and both showed substantial increases in labeled monocytes in the lung washouts.—Authors' Abstract

Dorken, E., Grzybowski, S. and Enarson, D. A. Ten year evaluation of a trial of chemoprophylaxis against tuberculosis in Frobisher Bay, Canada. Tubercle **65** (1984) 93–99.

A trial of chemoprophylaxis to prevent tuberculosis in Canadian Inuit (Eskimos) was carried out in Frobisher Bay, Canada, during 1971–1974. A completely supervised regimen of isoniazid and ethambutol thrice weekly for 18 months was administered. A 10-year evaluation of 370 treated persons and 217 control subjects demonstrates the sustained value of adequate chemoprophylaxis in reducing the risk of developing active tuberculosis in the 3 groups under study—1) those with a previous episode of active tuberculosis, 2) positive tuberculin reactors with normal chest X-ray, and 3) BCG vaccinated individuals with large tuberculin reactions. There were 3 cases of active disease in the treated group, a risk of 0.1% per annum, and 13 cases among the controls, a risk of 1.0% per annum.—Authors' Summary

El-Ansary, E. H. and Grange, J. M. Qualitative differences in tuberculin reactivity in patients with tuberculosis, occupational contacts and non-contacts. Tubercle **65** (1984) 191–194.

Qualitative differences in tuberculin reactivity between patients with pulmonary tuberculosis, occupational contacts and non-

contacts were observed. An erythematous reaction at 6–8 hr was frequently observed in both patients and contacts, but much less frequently in noncontacts. Itching and the presence of superficial bullae occurred principally in the contact group, and the erythematous reactions at 48 hr were largest in this group. Attention needs to be paid therefore to several characteristics, other than size, of the tuberculin reaction.—Authors' Summary

Estrada Parra, S., Velasco Castrejón, O., Rébora, F., Diaz, M. L. and Padierna, J. [Immunotherapy of advanced pulmonary tuberculosis with specific transfer factor (TF).] Salud Publica Mex. **25** (1983) 579–590.

The present paper is mainly an interesting small review on the development of immunotherapy including transfer factor. The authors show their own data from Mexico on the use of specific transfer factor for the therapy of advanced pulmonary tuberculosis in patients resistant to other treatment. The results are quite impressive but suffer due to the small number of patients involved (a total of 14) and the lack of methodological detail. In all patients, with the exception of one, treatment with specific transfer factor produced an improvement in both clinical and immunological parameters. This improvement was not seen in the group treated with placebo.—Vivian Rumjanek (*From* Trop. Dis. Bull.)

Garcia Montelongo, R., Alvarado Montesdeoca, M. L., Vivancos Gallego, G. and Noda Cabrera, A. Tratamiento del lupus eritematoso cronico con clofazimina. [Treatment of chronic lupus erythematosus with clofazimine.] Rev. Fontilles **14** (1984) 345–349. (in Spanish)

A dose of 200 mg daily of clofazimine was used to treat 45 patients with chronic lupus erythematosus; 33 patients were cured and 45% of these patients had no relapses after 1–3 years of follow up. Seven patients who did have relapses were started on treatment again and 5 of them managed to cure their lesions.

The medication failed on 10 patients. This seems to be due at least partially to their irregular intake of treatment, either due to laziness or because of its side effects, such as ichthyosis, hyperpigmentation, and gastrointestinal disturbances. Still, some cases are resistant or very little sensitive.—Authors' English Summary

Golyshevskaya, V. I., Zemskova, Z. S. and Korolev, M. B. Characteristics of the filterable forms of *Mycobacterium tuberculosis* and their pathological importance. Zh. Mikrobiol. Epidemiol. Immunobiol. **6** (1984) 23–27. (in Russian)

The results of the present investigation indicate that antituberculosis therapy for a period of 6 months leads to qualitative changes in *Mycobacterium tuberculosis* population. This is manifested by the appearance of the filterable forms of *M. tuberculosis* in pathological material. At the same time, these forms retain the initial pathogenicity of *M. tuberculosis* and induce not only tuberculous but also nonspecific inflammation. Among the population of these filterable forms, organisms carrying the genetic information of the species and capable of replication processes have been detected.—Authors' English Abstract

Goren, M. B., Grange, J. M., Aber, V. R., Allen, B. W. and Mitchison, D. A. Role of lipid content and hydrogen peroxide susceptibility in determining the guinea-pig virulence of *Mycobacterium tuberculosis*. Br. J. Exp. Pathol. **63** (1982) 693–700.

In a previous study [Abstracts on Hygiene, **54** (1979) abst. 172], certain associations were noted between virulence for the guinea pig and some cultural and biochemical reactions of *Mycobacterium tuberculosis*. However, only 4 phage type B strains were included. The present study has extended the observations to include 17 phage type B strains, 5 phage type I strains, H37Rv and H37Ra.

The results confirm that there is an association between a low level of virulence for the guinea pig and the following: the presence of low levels of strongly acidic (SAL) and sulfatide lipids (SL), a greater susceptibility to hydrogen peroxide, the presence of the attenuation indicator lipid

(AI), sensitivity to thiophene carboxylic acid hydrazide and a phage type I. These characteristics were largely typical of the Indian strains. High virulence for the guinea pig was associated with the opposite of these characters, a phage type B, and were typical of the Western strains.

However, certain discrepancies were noted. There appeared to be a group of Indian strains in which virulence for the guinea pig was attenuated but resistance to hydrogen peroxide remained high. The remaining characteristics were as for the other Indian strains. There were also 2 Western strains virulent for the guinea pig but susceptible to hydrogen peroxide. Finally 5 Western strains were of phage type I, virulent for the guinea pig, resistant to hydrogen peroxide and lacking the AI lipid. It is also noted that the loss of virulence by the H37Rv strain was accompanied by a decrease in the content of SAL and SL but by none of the other characteristics associated with attenuation.

The most favored explanation for these differences is that parallel evolution occurred among organisms which were widely separated geographically. Increased susceptibility to hydrogen peroxide would appear to be the main but not sole reason for attenuated virulence.—P. A. Jenkins (*From* Trop. Dis. Bull.)

Goren, M. B., Swendsen, C. L., Fiscus, J. and Miranti, C. Fluorescent markers for studying phagosome-lysosome fusion. J. Leukocyte Biol. **36** (1984) 273–292.

Lysosomotropic fluorescent aminoacridines such as acridine orange and quinacrine have achieved prominence as markers for studying lysosome-phagosome fusion, especially in macrophages. Experiments described demonstrate that because the aminoacridines traverse biological membranes with facility, they diffuse throughout the system, and ultimately accumulate intra- or extracellularly where they are most efficiently bound. Their presence or absence in phagosomes is therefore not unequivocally indicative of fusion or nonfusion. Alternative fluorescent lysosomal markers are described, and systems defined for which the aminoacridines may probably be used with confidence.—Authors' Abstract

Grange, J. M., Mitchell, D. N., Kemp, M. and Kardjito, T. Serum angiotensin-converting enzyme and delayed hypersensitivity in pulmonary tuberculosis. Tubercle **65** (1984) 117–121.

In contrast to sarcoidosis, there was no difference between serum angiotensin-converting enzyme (ACE) levels in a group of 100 adult Indonesian patients with active pulmonary tuberculosis and in 108 matched healthy control subjects. There was a significant inverse correlation between the diameter of the cutaneous reaction to tuberculin and serum ACE levels. It is postulated that, since both delayed hypersensitivity and ACE synthesis within granulomas appear to be the result of T cell induced secretory activities of macrophages, this inverse relationship results from competition for receptor sites for the relevant signal molecules on the macrophage surface.—AS (*From* Trop. Dis. Bull.)

Gutiérrez-Rodríguez, O. Thalidomide. A promising new treatment for rheumatoid arthritis. Arthritis Rheum. **27** (1984) 1118–1121.

In an open study, oral administration of thalidomide to 7 female patients with classic or definite rheumatoid arthritis, in doses ranging from 6.9 to 15 mg/kg/day, led to clinical improvement within several weeks. In 4 women, remission lasted long after discontinuation of the drug. All patients showed normalization or marked reduction of the erythrocyte sedimentation rate, and several showed a significant decrease in rheumatoid factor titer. Adverse side effects included drowsiness, constipation, and edema of the lower limbs, which disappeared after discontinuation of the drug.—Author's Abstract

Neva, F. A., Petersen, E. A., Corsey, R., Bogaert, D. H. and Martinez, D. Observations on local heat treatment for cutaneous leishmaniasis. Am. J. Trop. Med. Hyg. **33** (1984) 800–804.

Local heat treatment was tested and found effective in three patients with diffuse cutaneous leishmaniasis (DCL), a form of disease poorly responsive to the usual chemo-

therapy. A water bath that circulated water through a pad wrapped around the lesion provided a temperature of 39°C to 41°C for a cumulative time of at least 20 hr, over a period of several days. In the DCL patients beneficial effect of heat treatment was documented by pre- and post-treatment biopsies and cultures. Several other patients with ordinary cutaneous leishmaniasis did not respond to the same form of treatment. It was concluded that different strains and/or species of leishmanial parasites vary in their sensitivity to elevated temperature. While local heat treatment may be curative in certain cases of cutaneous leishmaniasis, such therapy is still experimental and should be monitored by quantitative parasitological studies to document its usefulness.—Authors' Abstract

Nozawa, R. T., Kato, H. and Yokota, T. Intra- and extracellular susceptibility of *Mycobacterium avium-intracellulare* complex to aminoglycoside antibiotics. Antimicrob. Agents Chemother. **26** (1984) 841–844.

We developed a rapid, quantitative culture method to estimate the replication of *Mycobacterium avium-intracellulare* complex (MAIC) in human peripheral blood mononuclear cells. Mononuclear cells were plated in a 96-well tray, infected with clinically isolated strains of MAIC in the presence of autologous plasma, and further cultivated for 1 to 2 weeks in a tissue culture medium. No MAIC cells proliferated extracellularly, since human plasma inhibited extracellular growth of the mycobacteria. The mononuclear cells were lysed through a brief treatment with alkali, and surviving intracellular mycobacteria were diluted and plated with tissue culture medium in a 96-well tray. Mycobacterial colonies were counted under a microscope after a 5-day incubation. The number of viable MAIC cells continuously increased, reaching 10 times the number of inoculated cells in a week. Thus, mononuclear phagocytes were the permissive site for the replication of MAIC. Intra- and extracellular susceptibilities of 7 MAIC strains to 4 aminoglycoside antibiotics were then studied. The mycobacteria were most susceptible *in vitro* to dibekacin (MICs, 3.13 to 12.5 μg/ml). Dibekacin at 12.5 μg/ml was bacteriostatic to 5 of 7 strains in the monocytes. Also, intracellular replication of the other 2 strains was greatly suppressed by that concentration of dibekacin.—Authors' Abstract

Reed, S. G., Baral-Netto, M. and Inverso, J. A. Treatment of experimental visceral leishmaniasis with lymphokine encapsulated in liposomes. J. Immunol. **132** (1984) 3116–3119.

Highly susceptible mice (C57BL/10) were infected with *Leishmania donovani chagasi* and were treated with supernatants, free or encapsulated in liposomes, from concanavalin A-stimulated or unstimulated mouse spleen cell cultures. Treatment consisted of multiple i.v. injections beginning 2 days before to 2 days after infection. Mice treated with lymphokine-rich supernatants encapsulated in liposomes had significantly fewer liver parasites than the control groups, demonstrating *in vivo* activity of lymphokine against an infectious organism.—AS (*From* Trop. Dis. Bull.)

Rullan, P. P., Barr, R. J. and Cole, G. W. Cyclosporine and murine allergic contact dermatitis. Arch. Dermatol. **120** (1984) 1179–1183.

Cyclosporine is a new antilymphocytic, immunosuppressive agent currently being used primarily in experimental and human organ transplantation. The current study evaluated the effect of systemically administered cyclosporine on a cutaneous T cell-mediated disorder by using the murine model of allergic contact dermatitis to dinitrofluorobenzene. Cyclosporine was found to significantly inhibit the ear swelling response, whether the drug was given during the early sensitization period or at the time of antigenic challenge to fully sensitized mice. This suppressive effect was reversible when mice were rechallenged with dinitrofluorobenzene 96 hr after the first challenge. Cyclosporine was not effective if given to sensitized animals as late as 6 hr after challenge. Lastly, the observed inhibition of the ear swelling response to cyclosporine closely paralleled a diminished degree of inflammation seen histopathologically.—Authors' Abstract

Weldon, J. S., Munnell, J. F., Hanson, W. L. and Alving, C. R. Liposomal chemotherapy in visceral leishmaniasis: An ultrastructural study of an intracellular pathway. Z. Parasitenkd. **69** (1983) 415–424.

The intracellular fate of liposomes administered intracardially was examined in the liver (Kupffer cells) and spleen of hamsters experimentally infected with *Leishmania donovani*. Separate groups of animals were treated with liposomes containing either an antileishmanial agent, a colloidal gold marker, or saline. Ultrastructural examinations of lysosomal interactions with the parasitophorous vacuole and with phagocytized liposomes were made. Lysosomes readily fixed with the parasitophorous vacuoles but appeared to have little effect on the parasite, possibly due to the production of enzyme inhibitors. Liposomes rapidly became localized in lysosomes subsequent to endocytosis by macrophages. Morphologic evidence suggested that secondary lysosomes containing liposomal residues then fused with the parasitophorous vacuole.—AS/J. Alexander (*From* Trop. Dis. Bull.)

Winkelmann, R. K., Connolly, S. M., Doyle, J. A. and Padilha-Goncalves, A. Thalidomide treatment of prurigo nodularis. Acta Derm. Venereol. (Stockh.) **64** (1984) 412–417.

Four patients with classic recalcitrant prurigo nodularis had symptomatic and physical responses to thalidomide with remissions. Three of the 4 patients had increased IgE levels that decreased during therapy. In 2 patients, short-term treatment (2 to 3 months) was not sufficient to produce remission, but retreatment was effective. Two patients had long-term remission with more than 6 months of treatment. No significant side effects occurred.—Authors' Abstract