Patarroyo and his colleagues at the Universidad Nacional de Colombia (Bogota), consists of three merozoite-derived epitopes linked by two copies of the circumsporozoite protein repeat.

Since a transmission-blocking vaccine would not provide protection to the immunized individual, it would not be used alone, but rather in combination with vaccines against the other parasite stages in a "cocktail." In this regard, recent results obtained by Roy Anderson and his colleagues at Oxford University (Oxford) using mathematical-modeling approaches suggest that, with a "universal" asexual-blood-stage vaccine used by itself, coverage of 85 percent of the susceptible population may be sufficient to have an impact on transmission. The addition of transmission-blocking epitopes to such a vaccine would presumably augment its impact on malaria transmission.

Furthermore, the fermentation protocol and purification method described by Kaslow was designed for vaccine production by the ultimate end users, as it is easily transferred to newly industrialized, malaria-endemic countries. This objective is commendable, since any sustainable effort to control malaria (and other tropical diseases) will only succeed by strengthening the control programs and biological-production facilities of these countries. Ultimately, though, appropriate disease management will remain a fundamental element of malaria control, as will such preventative actions as vaccine use, vector control, and personal-protection measures.

—Howard Engers

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PRODUCT UPDATE

Company	Product	Development
AutoImmune	Myloral	A phase III trial of Myloral—an oral formulation of bovine myelin—has begun in the U.S. and Canada. It will follow about 500 multiple sclerosis (MS) patients for two years to test Myloral's efficacy in reducing the number of attacks experienced by relapsing-remitting MS patients. A one-year, placebo-controlled pilot trial of Myloral in 30 MS patients showed a 50 percent reduction in attacks among treated patients, with no toxicity observed.
Biogen	Hirulog	Biogen announced results of the TIMI 7 trial, which compared the activity of four doses of Hirulog—a direct thrombin inhibitor—and aspirin in 410 patients with unstable angina. Reduction of death and myocardial infarction in patients treated with the three higher doses of Hirulog—which was administered as a constant infusion for 72 hours—was seen both at time of discharge and at six weeks. A second, larger study—named TIMI 8—will compare Hirulog to heparin in the management of unstable angina.
British Bio-technology	Batimastat	Results of a 15-patient, phase I/II trial of batimastat indicate that it may retard the progression of malignant ascites, a late-stage complication of ovarian and other abdominal cancers. Batimastat is a specific inhibitor of matrix metalloproteinases, enzymes secreted by cancer cells that destroy connective material between cells and allow cancer to grow and metastasize.
Centocor	CentoRx	The Food and Drug Administration (FDA) has accepted for agency review Centocor's product license application (PLA) and establishment license application (ELA) for CentoRx, a monoclonal antibody that inhibits platelet aggregation in the blood during and after high-risk coronary angioplasty.
Connaught Laboratories	Lyme disease vaccine	Connaught has initiated a phase III trial of its vaccine to prevent Lyme disease in about 8,000 volunteers. The study will compare the rate of infection among vaccinated individuals with that of a control group that has received a placebo. The recombinant vaccine consists of the outer surface protein A of *Borrelia burgdorferi*, the spirochete that causes Lyme disease.
CytRx	RheothRx	A 114-patient, phase II study showed that heart attack patients who received RheothRx, plus either streptokinase or tissue plasminogen activator, had an infarct size 38 percent smaller than patients who received either of the thrombolytics with a placebo. Also, the group treated with a thrombolytic plus RheothRx had a significantly lower risk of repeat heart attack during their hospitalization than patients in the thrombolytic plus placebo group and had significantly better heart function after the heart attack. RheothRx is a nonionic, copolymer surfactant that has antithrombotic, rheologic, and cytoprotective actions. A 9,000-patient, phase III trial of RheothRx used alone, or in combination with thrombolytic agents, to treat suspected heart attack will begin soon. Burroughs Wellcome owns worldwide rights to the compound.
Genzyme	Ceredase	The European Union's Committee for Proprietary Medicinal Products has given a recommendation for approval of Ceredase enzyme-replacement therapy for patients with Type I Gaucher disease, a genetic disorder caused by a deficiency of glucocerebrosidase. Ceredase is already approved in Australia, Israel, and the U.S.

Company	Product	Development
ImmuLogic Pharmaceutical	Allervax cat	ImmuLogic reported results of a phase II study of 91 patients who received either placebo or one of three subcutaneously administered doses of its Allervax cat therapeutic given weekly for four weeks. The results of patient symptom scores at six weeks after completion of dosing demonstrated a statistically significant decrease in symptoms from baseline when comparing patients receiving the two highest doses of Allervax cat to patients receiving placebo. Overall, ImmuLogic expects phase I/II trials of Allervax cat to involve over 350 patients.
Liposome Technology Inc.	Amphocil	The U.K.'s Medicines Control Agency (MCA) has confirmed that revisions to Liposome Technology Inc.'s (LTI) clinical package for Amphocil do not affect its earlier approval in the U.K. Amphocil is an intravenous formulation of amphotericin B for treating opportunistic systemic fungal infections that afflict immunocompromised patients. Thus, LTI and Zeneca Pharmaceuticals, which will market Amphocil in Europe, will recommence commercialization activities in the U.K. for Amphocil. Last December, LTI delayed commercialization to review the data in the original Amphocil submission to the U.K. MCA to ensure consistency of all data in the Amphocil clinical package.
Magainin Pharmaceutical	MSI-78	Results of a pivotal phase IIb/III trial of MSI-78 for impetigo—a serious skin infection that usually occurs in children—indicate that MSI-78 did not demonstrate a statistically significant advantage over the control vehicle. The study, involving approximately 290 evaluable patients, compared the efficacy of three concentrations of MSI-78 versus a control vehicle when administered topically three times a day for up to 12 days. An initial review of the data indicates that clinical and bacteriological responses in the range of 75 percent were achieved by both the control vehicle and each of the concentrations of MSI-78. A planned, second pivotal trial of MSI-78 in impetigo has been deferred pending further analysis of these results.
MGI Pharma	Salagen	Salagen tablets—the first oral form of pilocarpine hydrochloride—have been cleared for marketing by the FDA for treatment of radiation-induced dry mouth in head and neck cancer patients. Radiation treatment can damage patient salivary glands, leading to difficulty in eating, talking, and sleeping. Salagen stimulates residual functioning tissue in the damaged salivary glands to increase saliva production. MGI has licensed Salagen's European marketing rights to EuroCetus.
NeoRx	OncoTrac	NeoRx's partner, Boehringer Ingelheim (BI), has filed a PLA and BI's wholly owned subsidiary, Dr. Karl Thomae, has filed an ELA with the FDA for NeoRx's OncoTrac Small Cell Lung Cancer Imaging Kit. BI owns exclusive worldwide manufacturing rights to the product and rights to market it outside of North America. NeoRx claims that OncoTrac is virtually as accurate as a battery of four standard tests combined for determining the extent of small cell lung cancer in a patient.
Oxigene	Sensamide	Oxigene reported results of an interim analysis of a trial involving its chemo/radiation sensitizer, Sensamide, which is a unique dose formulation of metoclopramide. In the trial, 14 lung cancer patients received radiation therapy combined with Sensamide, while 11 lung cancer patients received radiation therapy only. The average survival was 395 days in the Sensamide group versus 210 days in the radiation-only group. Survival, as well as tumor response, are the endpoints in Sensamide's ongoing phase II/III trial.
Regeneron	CNTF	Regeneron plans to modify and extend its ongoing phase III study, involving 720 patients, of ciliary neurotrophic factor (CNTF) for amyotrophic lateral sclerosis (ALS) to provide statistically significant information about the efficacy of CNTF in ALS, as a review of interim study data has shown that patient side effects have largely scuttled the study. CNTF side effects early in the study, such as weight loss and cough, were associated with poorer performance on muscle-strength tests, the primary outcome measure of the study. Once the side effects eased, patients receiving CNTF performed better than those receiving placebo, as measured by the rate of decline of muscle strength. CNTF patients who experienced less severe side effects had objectively less weakening of muscles than did placebo patients.
Ribi ImmunoChem Research	Melacine & Intron-A	The combined use of Ribi's Melacine melanoma theraccine and ScheringPlough's Intron-A interferon alpha-2b extends survival and enhances tumor regression in late-stage melanoma patients in comparison to individual use of the two agents. Median survival has not been reached and has exceeded 32 months in 8 of 18 patients given the combination therapy. The specific mechanism of activity of the combination therapy is undetermined, however. Melacine—which incorporates Detox adjuvant with human-melanoma tumor-cell lysate as the antigen—is inphase III trials in late-stage melanoma patients versus a four-drug chemotherapy regimen.

Company	Product	Development
Schering Plough	Intron-A	The Japanese Ministry of Health announced biennial pharmaceutical price reductions, including a 17.3 percent price cut for Intron-A alpha interferon to treat chronic, active hepatitis C. Worldwide sales of Intron-A totaled $572 million in 1993, with Japan representing approximately $300 million of those sales.
Somatogen	rHb1.1	Somatogen has presented data from four phase I studies of rHb1.1, recombinant human hemoglobin. The studies involved 93 subjects, including 76 subjects infused with rHb1.1 doses of up to 25 grams, and established the initial safety profile of rHb1.1, which is currently undergoing studies in surgical patients.

—Mike Ginsberg

ALLIANCE UPDATE

Companies	Agreement
Amgen & Amcell	Amgen and Amcell will commercialize products based on Amcell's cell-separation and characterization technology to treat cancer, AIDS, and other life-threatening diseases. Amgen, which has made an equity investment in Amcell, gets exclusive, worldwide rights to commercialize certain cell-separation products, while Amcell will manufacture and supply these products. Amcell's technology was actually developed by Germany's Miltenyi Biotec.
Applied Microbiology & Astra/Merck Group	Applied Microbiology (AM) and the Astra/Merck Group will jointly develop pharmaceutical products to eliminate *Helicobacter pylori*, a common bacterium implicated in the development of most peptic ulcers. AM will provide Astra/Merck with exclusive licenses in the U.S. for the use of AM's antimicrobial peptides in *H. pylori* products. AM will also assure Astra/Merck of an ongoing source of antimicrobials for the products being developed.
Athena Neurosciences & NeuroSearch	Athena and NeuroSearch have terminated the research portion of their October 1992 agreement in the field of neuron-specific calcium-channel blockers. Athena, however, will evaluate a compound derived through the collaboration. Athena gets exclusive rights to commercialize the compound in North America, while NeuroSearch gets exclusive commercialization rights in Scandinavia. The two will share commerical rights to other markets.
Cortecs International & Boehringer Mannheim Diagnostics	Boehringer will test Helisal, Cortecs' laboratory-based ELISA immunoassay to detect antibodies to *H. pylori*—the bacterium implicated peptic-ulcer development—in blood serum. Boehringer will test Helisal in about 4,000 patients in Japan and elsewhere. Helisal has already been launched in the U.K. by Cortecs and by its licensee in Canada.
CytoTherapeutics & Genentech	The two will develop central-nervous-system therapeutics based on the encapsulation and implantation of cells within the body to produce neurotrophic factors to treat neurodegenerative diseases. The first application will be the use of nerve growth factor (NGF) to treat Alzheimer's disease, using CytoTherapeutics' encapsulated cell implants for the site-specific, continuous delivery of NGF. CytoTherapeutics will retain worldwide manufacturing rights and North American copromotion rights, while Genentech gets exclusive marketing rights outside of North America. The potential $15.3 million deal involves Genentech purchasing $3.5 million of CytoTherapeutics' common stock. It also includes four additional growth factors.
CytoTherapeutics & NeuroSpheres	CytoTherapeutics has obtained an exclusive, worldwide license from Canada's NeuroSpheres to develop neural stem cells for transplantation to treat human diseases. Neural stem cells can divide virtually indefinitely *in vitro* in the presence of certain growth factors. CytoTherapeutics plans to encapsulate these stem cells to treat neurodegenerative disorders and to explore the use of the cells as a vehicle for gene-therapy applications. The agreement finalizes an evaluation agreement entered into in July 1992.
Medarex & E. Merck	The two will develop Bispecific antibodies to treat certain cancers. Initially, they will focus on developing a Bispecific antibody to treat tumors overexpressing the epidermal-growth-factor receptor (EGF-R), a product composed of Merck's humanized EGF-R targeting antibody linked to Medarex's humanized Trigger antibody. Merck will provide Medarex with up to $29 million in funding. Medarex gets exclusive commercialization rights in the U.S. to any products developed, while Merck gets exclusive rights in Europe. The two will jointly hold commercialization rights for the rest of the world.
Millennium & Hoffmann-La Roche	The two will develop therapeutics based on Millennium's genomics technologies. The agreement—which covers two disease targets, obesity and Type II diabetes, and is valued at over $70 million—involves Roche taking an equity position in Millennium and providing substantial research funding. Roche gets exclusive, worldwide rights to small-molecule therapeutics for obesity and diabetes outside North America. Also, Roche gets exclusive rights to antisense, protein, and gene-therapy therapeutics, though Millennium can copromote these therapeutics in North America. Roche, moreover, gets a worldwide option on all diagnostic applications.
Novo Nordisk & Karo Bio	The two have teamed to in a three-year program to develop drugs for osteoporosis. Novo will fund the program and get first right of refusal to worldwide commercialization of product candidates. Both firms will assign an equal number of researchers to focus on computer-aided drug design to identify compounds acting on the estrogen receptors.