Pharmaceutical Clinical Trials–Phase Three

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COMPANY	PRODUCT	PRODUCT TYPE	INDICATION	STATUS
GENERAL INTEREST—PHASE III				
Circulatory				
Alliance Pharmaceuticals Corp.	LiquiVent	Intrapulmonary agent; oxygen-carrying liquid drug, perflubron	Acute lung injury and acute respiratory distress syndrome	Company completed enrollment in its pivotal Phase II/III study 12/00
Alliance Pharmaceuticals Corp.	Oxygent (perflubron emulsion)	Blood substitute; intravascular oxygen carrier	Reduction in the use of donor blood transfusions in cardiac surgical patients	Reached an agreement with FDA on Phase III trial design 9/99; entered US Phase III 12/99; enrollment completion expected late 2000 or early 2001; completed enrollment in pivotal European Phase III 5/00; preliminary results expected fall 2000; Phase III data showed that patients who lost a certain amount of blood and received Oxygent either completely avoided the need for blood more frequently than the control group or required fewer units of blood 12/00
AnorMED Inc./DuPont Pharmaceutical Co.	DMP-444	Radiopharmaceutical imaging agent	Detection of pulmonary emboli (blood clots in the lung)	Phase III; ND
Biopure Corp.	Hemopure (HBOC-201)	Purified, modified bovine hemoglobin	Alternative to red blood cell transfusions before, during and after surgeries	Phase III; the trial expects to enroll 640 patients; NDA filing expected in 2000; an independent panel reviewed safety data at the trial's halfway point and recommended patient enrollment continue 10/99; positive clinical trial results published 2/00; pivotal Phase III trial enrollment completed in the US, Europe, Canada and South Africa 7/00
Centocor Inc.	ReoPro and Retavase (Retaplase recombinant)	Chimeric monoclonal antibody; recombinant plasminogen activator	Acute myocardial infarction	Phase III; enrolling patients 2H:98; positive results reported 8/99
Centocor Inc.	ReoPro (abciximab)	Chimeric monoclonal antibody fragment GP IIb/IIIa platelet	Unstable angina	Phase III; completed patient enrollment 5/00; the double-blind, randomized and placebo-controlled and conducted at 458 worldwide sites Phase III trial results didn't provide a statistically significant benefit over placebo 8/00
Centocor Inc.	ReoPro (abciximab)	Chimeric monoclonal antibody fragment GP IIb/IIIa platelet receptor	PTCA	Phase III enrollment began 3Q:96 positive preliminary Phase III results reported 3/98; positive 6-month data reported 8/98; positive Phase III data reported 10/98; positive 1-year follow-up reported 11/98
Cerus Corp/Baxter Healthcare Corp.	Intercept (S-59 psoralen compound)	Pathogen inactivation system for platelets based on light-activated psoralen compound, S-59	Transfusions	Began Phase III enrollment 7/99; 600 patients enrolling at 11 US sites; completed enrollment in European Phase III 3/00; an independent Data Safety monitoring Board recommended the trial continue 4/00; announced results of the European Phase III trial, which supports a regulatory submission in Europe 8/00

COMPANY	PRODUCT	PRODUCT TYPE	INDICATION	STATUS
Colateral Therapeutics Inc.	GENERX	Angiogenic gene therapy	Stable exertional angina	Expects to enter Phase II / Stable exertional angina II 4Q:00
COR Therapeutics Inc.	Integrilin (eptifabatide)	Synthetic peptide derived from the venom of Southeastern pygmy rattlesnake		Patients undergoing coronary intervention with stenting
CV Therapeutics Inc. / Innovex Inc.	Ranolazine (piperazine acetamide)	Oral compound that lets the heart burn glucose instead of fat for energy; perzine acetamide		Entered 150-patient, multicenter US Phase III $Q:97; completed enrollment 6/99; positive initial results reported 8/99; positive results presented 3/00; entered 2nd pivotal Phase III 7/99; NDA filing expected in 2001
DRAXIS Health Inc.	Fibrimage	Recombinant polypeptide with high-binding affinity for fibrin, the primary component of deep vein thrombosis; labeled with technetium-99	Deep vein thrombosis	Entered Phase III 2/00
DuPont Merck Pharmaceutical Co.	Definity (DMP115) (perflutren)	Ultrasound contrast agent	Ultrasound contrast agent primary pumping chambers of the heart	Reported positive Phase III results 6/98; NDA submitted 12/98 based on 7 multi-center, randomized Phase III trials involving 610 patients at 52 US centers
Emisphere Technologies Inc./ Elan Corp. plc	Oral form of heparin	Anticoagulant; anti-thrombotic compound	Deep-venous thrombosis	Phase III protocol approved by the FDA 12/99; began enrollment of 2,250 patient Phase III at 80-90 centers in the US, UK and Canada 1/00; study completion and NDA submission expected 2H:01 with launch expected early 2002
Enzon Inc./Green Cross Corp (Japan)	Recombinant human serum albumin (RHSA)	Blood volume expander	Hemorrhagic shock and cirrhosis with ascites	Entered Phase III 3/95; trials complete; submitted approval application in Japan; marketing clearance in Japan expected 2H:00
Epix Medical Inc./Mallinckrodt Inc.	AngioMARK	Intravascular MRI contrast agent	Detection of aortoiliac occlusive disease	Entered Phase III 6/99
GD Searle & Co.	Orbofiban	Oral GP IIb/IIIa inhibitor	Prolonged therapeutic prevention of clot-related events in patients with acute coronary syndrome	Phase III; ND
Genentech Inc./Actelion Ltd.	Tezosentan	Endothelin receptor antagonist	Acute heart failure	Phase III ongoing
Genentech Inc./ Hoffman-La Roche Inc.	Xubix (sibrafiban)	Oral glycoprotein IIb/IIIa antagonist	Acute coronary syndrome	Phase III; ND
Genetics Institute Inc.	rNPA	Recombinant novel plasminogen activator	Heart attack	Phase III; ND
Genzyme Transgenics Corp.	Unnamed	Transgenically produced recombinant human antithrombin III (rhATIII)	To restore sensitivity to the anti-coagulant heparin in elective heart surgery patients	Positive Phase III data reported 1Q:00
Genzyme Transgenics Corp./ Genzyme General	Recombinant human antithrombin III (rhATIII)	Transgenically produced anti-clotting therapeutic	Restoring heparin sensitivity to heparin-resistant patients scheduled for elective cardiac surgery requiring cardiopulmonary bypass	Entered 3 multicenter Phase III studies at over 20 sites in the US and Europe 5/98; positive data reported 1/00; one of two pivotal Phase III trials completed 5/00; filing expected in 2000; primary endpoint of reduction in the use of frozen plasma was statistically significant in a second Phase III trial 9/00
Hemosol Inc.	Hemolink	Human hemoglobin-based blood substitute	Blood transfusion for patients undergoing coronary artery bypass grafting (CABG) surgery	Entering 600-patient US Phase III 6/00; enrolling patients 6/00; treatment should begin 9/00; the trial should last one year; NDA filing expected 2H:01

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Hoescht Marion Roussel Inc.	Refludan	Thrombin inhibitor	Unstable angina	Phase III in US and Europe
Ibex Technologies Inc.	Neutralase	Heparinase-1, a heparin degrading enzyme (bolus injection)	Heparin neutralization patients undergoing 1st time cardiac bypass surgery	Initiated 1st international Phase III trial 4/98
ICOS Corp.	Sitaxsentant	Endothelin-1 antagonist	Pulmonary hypertension	Expects to enter Phase II/III in 2000
Immunex Corp	Enbrel	Tumor necrosis factor receptor	Chronic heart failure	Entered Phase II/III 3/99; the double blind, placebo-controlled study will include 900 patients in Europe and Australia; results expected 1H:01
InterMune Pharmaceuticals Inc.	Actimmune	Interferon gamma-1b injection	Idiopathic pulmonary fibrosis	Company started a Phase III trail in 10/00
The Medicines Co.	Angiomax (formerly Hirulog)	Antithrombotic; anticoagulant (bivalirudin)	Myocardial infarction	Entered international Phase III 12/98; the trial will involve 17,000 patients at 600 sites in 47 countries; completion expected early 2001
The Medicines Co.	Angiomax (formerly Hirulog) (vibivalirudin)	Antithrombotic; anticoagulant	Heparin-induced thrombocytopenia and thrombosis syndrome (HIT/HITTS)	Phase III ongoing 6/00
Myogen Inc.	Enoximone	Positive inotrope (oral)	Advanced heart failure	Completed Phase II; preparing to enter pivotal Phase III; published findings in the *Journal of the American College of Cardiology* from a double-blind, placebo-controlled study show that low doses of enoximine improve exercise ability of patients with heart failure
Northfield Laboratories Inc.	PolyHeme	Chemically modified hemoglobin derived from outdated human donor blood	Blood substitute	Entered multicenter Phase III 9/97; FDA requested the company expand the number of patients in Phase III 8/98
Questcor Pharmaceuticals Inc., (Cypros Pharmaceutical Corp. and RiboGene Inc. merged 11/99)	Cordox (CPC-111)	Metabolic enhancer drug delivered intravenously	To lessen heart damage during coronary artery bypass grafting and to help resume heart function	Expects to enter 400- to 1,000 patient Phase III at 30 US sites; FDA favorably reviewed Phase III study designed 8/99; FDA granted fast-track status 9/99; seeking partnership before starting trial
Sanofi SA	SR 90107	Pentasaccharide; antithrombotic	Thrombosis	Entered Phase III 2Q:98
Sonus Pharmaceuticals Inc.	EchoGen Emulsion	Fluorocarbon-based ultrasound contrast agent	Diagnosis of abnormal and normal blood flow and organ lesions in the liver, kidney, brain, breast and peripheral vasculature	Entered pivotal US Phase III 7/95; completed 253-patient enrollment 11/95; NDA filed 8/96; completed European Phase III 9/96; EMEA filed 12/96; FDA ruled advisory panel review not necessary

Pharmaceutical Clinical Trials—All Phases

Company	Product	Product Type	Indication	Status
Abgenix, SangStat	ABX-CBL	Murine anti-CD147 Mab	Treatment of steroid-resistant graft-versus-host disease	Phase III; 11/3/00 company announced that the FDA granted orphan drug status
Millennium Pharmaceuticals	agCD3	Humanized, engineered non-oclonal antibody	Juvenile onset diabetes	Pre-clinical
SangStat	Azathioprine	Azathioprine, T-cell inhibitor (as an adjunct to Cyclosporine A)	Prevent organ rejections, chronic immunosuppression	Market
Orphan Medical, Inc.	Busulfex	Busulfan	A conditioning regimen prior to allogeneic hematopoietic progenitor cell transplantation for chronic myelogenous leukemia (CML)	Market; 2/99 FDA approval, 7/99 approved in Canada
Schering AG	CCRI	Inducible nitric oxide synthase inhibitor	To treat multiple sclerosis and rejection in organ transplantation	Pre-clinical
Roche Holding	CellCept	Mycophenolate mofetil—inosine monophosphate dehydrogenase inhibitor	To prevent acute renal transplant rejection in children 3 months to 18 years old and to protect against organ rejection in patients receiving allogenic hepatic transplants	Phase III
Nexell Therapeutics	Ceprate SC	Stem cell concentrator	Peripheral blood stem cells for small cell lung cancer, autologous bone marrow transplantation	Market; also for sale in Europe, Canada and some Asian-Pacific and Latin American countries. Originally developed and marketed by CellPro. 9/98 CellPro filed for bankruptcy and purchased by Nexell Therapeutics. Nexell partner Baxter Healthcare corporation, agreed to distribute CEPRATE kits for a limited time to ensure that patients and clinicians would have continued access to cell selection technology while the FDA reviews Nexell's premarket approval application for the Isolex Stem Cell Selection System. Once Isolex is approved, Ceprate will be phased out.
Novartis Pharmaceuticals Corp.	Certican	Growth factor-induced cell proliferation inhibition	To prevent acute or chronic organ rejection in transplantation	Phase III
Bristol-Myers Squibb Pharmaceutical Research	CTLA4-Ig/LEA29y	Monoclonal antibody; antibody fusion proteins with selective immunosuppressive activity; LEA29y is targeted for prevention of solid organ transplant rejection. CTLA41-Ig is targeted for RA and psoriasis.	To prevent organ transplant rejection	Phase II
Roche Holding	Cymeval	Valganciclovir; ganciclvir prodrug	Oral administration for the treatment of cytomegalovirus retinitis in HIV-infected patients and immunocompromised transplant recipients	NDA submitted; approval pending FDA review. Note: Known as Cymeval[a] during trials; however, this trademark has been abandoned, and valganciclovir will be marketed under a different brand name if approved.
MedImmune	Cytogam	Cytomegalovirus Immune Globulin Intravenous (CMV-IGIV)—immunoglobulin IV (IgG) containing a standardized amount of antibody to Cytomegalovirus (CMV)	Prophylaxis against CMV disease associated with transplantation of kidney, lung, liver, pancreas, and heart	Market; originally prevention of cytomegalovirus (CMV) in kidney transplant patients was the only indication. 12/98—additional organ indications approved. 11/99—MedImmune completes acquisition of US Bioscience.

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Chimeric Therapies	Engineered bone marrow graft	Process unrelated bone marrow	Leukemia, transplants—acute or chronic graft-versus-host disease	Phase II/III
GlaxoSmithKline, Biochem Pharma Inc.	Epivir	Lamivudine	To prevent liver graft rejection by hepatitis B virus	Phase III
Novartis Pharmaceuticals Corp.	ERL 080	Inosine monophosphate dehydrogenase inhibitor	To prevent organ transplant rejection	Phase III
Novartis pHarmaceuticals Corp.	FTY720	Immunosuppressant	To prevent renal allograft rejection	Phase II
LSR Biotechnology Inc.	HK-Cardiosol	Organ preservation	Heart preservation solution during heart transplantation	Phase III
Baxter Healthcare Corp.	HSV-tk	Herpes simplex virus-thymidine kinase; cell therapy	To treat graft-versus-host disease in donor leukocyte infusions	Phase II
Nexell Therapeutics	Isolex 300 Magnetic Cell selection System		Processing autologous peripheral blood progenitor cell (PBPC) products to obtain $CD34^+$ cell enriched population for hematopoietic reconstitution after myeloablative therapy	Market; 3/99 Receive FDA approvable letter. 7/99—FDA gives marketing clearance
Cangene Corp (partners—CANJI, Schering-Plough Corporation, Apotex Inc.)	Leucotropin	Recombinant human GM-CSF for myeloid reconstitution	Bone marrow transplant	Phase III; Entered Phase III in Canada mid-1997; study ongoing
Immunex Corp. (partners—American Home Products)	Leukine	Granculocyte macrophage colony-stimulating factor (GM-CSF) (sargramostim)	Myeloid recover in Auto and AlloBMTs, BMT engraftment or delay, and PBPC mobilization and post-transplant support	Market
Immunex Corp. (partners—Wyeth-Ayerst Laboratories, American Home Products)	Leukine Liquid	Yeast-derived granulocyte macrophage colony-stimulating factor (GM-CSF) (sargramostim); ready to use formulation multidose vial	Neutropenia (blood disorders), transplants (cancer, immune disorders)	Market; 11/96, supplement PLA approved for ready to use formulation multidose vial Liquid Leukien
Cell Therapeutics (partners—OrthoBiotech, Johnson & Johnson, BioChem Pharma Inc.	Lisofylline	Lisogylline inhibitor of phosphatidic acid (LSF)	Graft-versus-host disease/neutropenia-related serious infections in ablative therapy due to treatment of BMT transplant	Terminated; 1999—company will not pursue this drug any further
Incara Pharmaceuticals Corp.	Liver Precursor Cell Program	Hepatocyte precursor	Treatment for children with life-threatening inherited genetic diseases and adults with chronic liver failure	Pre-Clinical
Bio Transplant, MedImmune	MEDI-507	Monoclonal antibody murine anti-human T-cell receptor antibody (T10B9)	Steroid resistant GvHD, GvHD in renal transplants	Phase II—FDA orphan drug
Boehringer Ingelheim GmbH	Murine monoclonal antibody-based drug	Immunoglobulin G2a, mouse Mab (murine monoclonal antibody-based drug—BIRR1)	GvHD in renal transplant patients	Phase III
NABI	Nabi-HB	Hyperimmune globulin for hepatitis B (or polyclone antibody to HBV); IV	Prevention of hepatitis B re-infection in liver transplants	Market; 10/99 filed for approval in Canada
Protein Design Labs	Nuvion	SMART anti-CD3; HuM291 (humanized anti-CD3 monoclonal antibody)	GvHD in patients with steroid-refractory graft versus host disease in patients who receive allogeneic stem cell transplants	Phase I/II; 12/02/00—Company announces encouraging preliminary results from Phase I trial; expects to initiate a Phase II/III trial next year.
Immunex Corporation (partners—American Home Products)	PIXY321	GM-CSF/IL-3 fusion protein	Bone marrow transplant engraftment	Phase III
Fujisawa Healthcare Inc.	Prograf (tacrolimus)	Immunosuppressive agent known as FK-506	Prevention of graft-vs-host disease	Completed enrollment in 180-patient US Phase III at 12 sites 9/96; NDA filed 7/98; and FDA advisory panel did not recommend approval 1/99
Novartis Pharmaceuticals Corp.	Protovir	Sevirumab; cytomegalovirus DNA inhibitor	To prevent cytomegalovirus infections in allogenic bone-marrow transplantation	Phase II
Novartis Pharmaceuticals Corp.	RAD 001	Inhibition of growth factor-induced cell proliferation	Transplants (cancer, immune disorders)	Phase III

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Wyeth-Ayerst Pharmaceuticals, American Home Products	Rapamune	Sirolimus, an immunosuppressive to be given in combination with cyclosporine (oral solution; liquid; tablets)	Prevention of kidney transplant rejection	Market; 12/99—FDA accepts NDA for Rapamune in tablet formulation. The oral solution was approved for marketing in 9/99. 08/29/00—Wyeth-Ayerst announces FDA approval
American Home Products Genetics Institute (partners—Novartis Pharmaceuticals Corp.)	rhIL-6	Recombinant human interleukin-6 (IL-6)	Transplants (cancer, immune disorders)	Phase III
SangStat	Sang-2000	Cyclosporine A oral capsules	Prevent organ rejections, chronic immunosuppression	Phase III; SangStat's Cyclosporine Oral Solution (SangCya) has been FDA approved. Sang-2000 is a capsule dosage form based on a similar cyclosporine formulation technology; the pivotal bioequivalence trial has been completed. 3/99—filed for approval in Europe.
SangStat (partners—Aventis S.A.)	Sang-35	Thymoglobulin; polyclonal antibody—thymoglobulin; polyclonal antibody—Anti-thymocyte globulin (rabbit)	Prophylaxis and treatment of acute graft rejection in renal transplantation	Market; 3/00 approved in Canada. Pasteur Merieux Connaught is now Aventis Pasteur.
SangStat (partners—Abbott Laboratories, Gensia Sicor Pharmaceuticals, Eli Lilly and Co.)	SangCya	Sang 35 Cyclosporine A, oral solution	Prevent organ rejection, chronic immunosuppression	Market; 4/00—approved in Germany
Novartis Pharmaceuticals Corp.	Simulect	Basiliximab; IV or injection	For the prevention of acute rejection episodes in kidney transplant recipients	Market
Novartis Pharmaceuticals Corp.	Simulect	Basiliximab (monoclonal antibody)	To prevent acute organ rejection in patients receiving renal transplantation when used as part of an immunosuppressive regimen that includes cyclosporine and corticosteroids	Phase III
Novartis Pharmaceuticals Corp.	SIT 115	An aid in transplantation procedures	Transplants (cancer, immune disorders)	Phase II
Sparta Pharmaceuticals	Sparaject busulfan	Intravenous delivery of busulfan	Bone marrow ablation prior to transplant	Entered Phase II/III 12/98; completed expected mid-2000
Amgen	Stemgen	Ancestim; stem cell factor to mobilize peripheral blood progenitor cells; given with Neupogen	High-dose chemotherapy	BLA/NDA; 4/97—FDA filing; 7/98—the Biological Response Modifier's Advisory Committee to the FDA voted to recommend the approval of Stemgen. Still under active review by FDA.
Eligix	Tcell-HDM	High-density microparticle technology used to deplete immune T cells that are procedure implicated in GvHD; (donor) leukocyte infusion depleted of $CD8^+$ T cells)	Graft-versus-host disease	Phase III; received clearance to enter Phase III 7/99
Celgene Corp.	Thalomid (thalidomide) (formerly Synovir)	Immunological agent	Graft-versus-host disease	Phase II/III protocol in development
PathoGenesis	TOBI	Aerosilized tobramycin (broad spectrum antibiotic) solution for inhalation	Transplants (cancer, immune disorders)	Phase II; 9/00—PathoGenesis acquired by Chiron Corp.
Roche Holding	Ularitide	Renal peptide	To prevent renal transplant rejection	Phase II
Roche Holding	Valixa	Valganciclovir; ganciclvir prodrug	CMV, HIV, transplant (cancer, immune disorders)	Phase III
Alpha Therapeutic	Venoglobulin-S	Solvent detergent treated immune globulin for prevention	Acute graft-versus-host disease in bone marrow transplant	Phase III
ICN Pharmaceuticals	Virazole	Ribavirin	Respiratory syncytial virus, transplants cancer, immune disorders); RSV in bone marrow transplants	Phase III
Gilead Sciences (partners—Pharmacia Corp.)	VISTIDE	Nucleotide analog (aka GS 504, cidofovir intravenous)	CMV, transplants (cancer, immune disorders); bone marrow transplant patients with CMV pneumonitis	Phase II/III
Protein Design Labs (partners—Hoffman-La Roche)	Zenapax	Daclizumab—humanized monoclonal antibody to IL-2R (SMART Anti-Tac)	Renal disease, transplants (cancer, immune disorders); prevention of acute kidney transplant rejection	Market; Also approved in over 27 countries including most of Europe. Filed for approval in Canada, others. 3/99—EU approval.

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Protein Design Labs (partners—Hoffman-La Roche)	Zenapax	Daclizumab—humanized (Mab to IL-2 TAC receptor)	Transplants (cancer, immune disorders); GvHD	Phase II; Licensed to Hoffman-La Roche for marketing and development. Approved and marketed for prevention of acute kidney transplant rejection
Protein Design Labs	Zenapax	Daclizumab—SMART Anti-Tac antibody	Cardiovascular disorder (misc), transplants (cancer, immune disorders); heart transplantation	Phase III
Roche Holding	Zenapax	Daclizumab (monoclonal antibody and inosine monophosphate dehydrogenase inhibitor)	Transplants (cancer, immune disorders), wound closure/surgical adhesive/tissue grafting; to prevent graft rejection in pediatric renal transplants	Phase III
Roche Holding	Zenapax	Daclizumab (monoclonal antibody)	Transplants (cancer, immune disorders); to prevent graft rejection in pediatric renal transplants	Phase I/II