2528	08-06-90	563,758
Gelfand, Watson, Holland, Saiki		Homogeneous Assay System
2528.1	08-6-91	91/05571
2529	04-10-90	507,309
Scharf, Erlich		Enzymatic Amplification of the VNTR of the Retinoblastoma Gene
2532	12-22-89	455,611
2532.1	09-20-90	585,471
Gelfand		Reverse Transcription with Thermostable DNA Polymerases -- High Temperature Reverse Transcription
2532.2	12-20-90	PCT 90/07641
2532.3	08-15-91	746,121
2533	12-22-89	455,967
Gelfand, Lawyer, Stoffel		Recombinant Expression Vectors and Purification Methods for Thermus thermophilus DNA Polymerase
PCT	91/09950	07-11-91
2536	03-07-90	489,676
2536.1	03-07-91	PCT 91/01574
White, Dodge		Method for Diagnosis of Lyme Disease
2537	02-07-90	477,260 Aband 12-17-91
2537A	12-5-91	
Lyons, McCormick		Detection of Point Mutations in ras and G-Protein Genes
2537.1	02-07-91	PCT91/00858
2549	07-24-90	557,517
2549.1	11-02-90	609,157
Sninsky, Gelfand		The Prevention of Carryover Contamination During in vitro Nucleic Acid Replication Using Modified Nucleic Acid Bases
89-130; Disclosed 89-113, Clevbl primers, 90-019, Cloning UNG, 90-079, Stabilized UNG,		
2549.2	07-23-91	91/05210
Kwok, Sninsky, Gelfand		The Reduction of Non-Specific Amplification During In Vitro Nucleic Acid Amplification Using Modified Nucleic Acid Bases
2559	12-06-90	623,098
Erlich, Scharf, Begovich, Bugawan, Griffith		Methods and Reagents for HLA DRbeta DNA Typing
2559.1	12-06-91	PCT
Apple, Erlich, Scharf, Begovich, Bugawan, Griffith		
2570	08-13-90	567,244
2570.1	08-13-91	91/05753
Gelfand, Stoffel, Lawyer		Purified Thermostable Nucleic Acid Polymerase Enzyme from Thermotoga maritima
2572	06-29-90	546,389
Higuchi		Preparation of Single-Stranded PCR Product DNA with Lambda Exonuclease

2574 08-06-90 563,407
Gelfand Recombinant Lambda Exonuclease

2576 12-21-90 632,180
Erlich, Bugawan HLA DObeta DNA Typing
PCT _____

2577 08-27-91 751,305
90-025, Varble Regn Primrs, Kwok and Sninsky, rcd 3-14-90, r3 4-90, rated 2 6-6-90, advised Roche, ltr 6-20; r3 10-3-90
Primers and Probes for Hepatitis C Detection

2580 09-30-91 PCT/US91/07035
5' to 3' Exonuclease Mutations of Thermostable DNA Polymerases
90-045, rcd 5-22, 5'-3' Exo mutants, Abramson, rated 3 6-6-90, PCR-D mgt r2 on review see 89-117; filed in 2581 to 2583, review 6 mos. after those filing dates said Com on 10-3-90

2581 09-28-90 590,213
Abramson, Gelfand, Greenfield
Purified Thermostable Nucleic Acid Polymerase Enzyme from Thermus Species sps17
Combined with 2582, 2583, and foreign filed as 2580

2582 09-28-90 590,466
Abramson, Gelfand, Greenfield
Purified Thermostable Nucleic Acid Polymerase Enzyme from Thermus Species Z05
Combined with 2581, 2583, and foreign filed as 2580

2583 09-28-90 590,490
Abramson, Gelfand, Greenfield, Lawyer
Purified Thermostable Nucleic Acid Polymerase Enzyme fromThermocypho africanus
2583.1 09-26-91 PCT/US91/07076

2598 05-07-91 696,793
Nasarabadi, Saiki Methods and Reagents for G-gamma Globin Typing
Pub App 90-091, rcd 11-2, r1 12-12-90

2599 05-02-91 695,201
Higuchi Homogeneous Methods for Nucleic Acid Amplification and Detection
90-066, rcd 7-27, r3 10-3-90, r2 12-12-90

2602 04-03-91 679,736
Bloch
Improvements in the Precision and Accuracy of Anion-Exchange Separation of Nucleic Acids

---

2603 04-30-91
Kawasaki, Levenson, Wilt, Zhang Membrane Bound Probes
90-046

2607 06-20-91 718,576
Erlich, Higuchi Improved Methods for Nucleic Acid Amplification
89-117, 2558, 2580, 90-045

2612	08-15-91	746,704		
Young	Mycobacterium Primers and Probes			
90-060				
2613	06-26-91	720,061		
Sobol, Green, Kawasaki	Detection of Carcinoma Metastases by Nucleic Acid Amplification			
See PCT 89/08717				
2614	07-23-91	733,419		
Nuovo, Bloch	Improvements in the In Situ PCR			
Nuovo manuscript, 91-026 (SUNY)				
2624	11-05-91	788,113		
Erlich, Bugawan	Methods and Reagents for HLA Class I DNA Typing			
2099	01-21-83	459,973	Aband	05-01-83
2099.1	05-05-83	489,866	Issued	10-23-84 as U.S. 4,478,094rx
EP 114,686 08-01-84				
Salomaa, Merrill, Leath, Wennberg, Widunas	Liquid Sample Handling System			
2118	10-14-83	542,114	Issued	11-26-85 as U.S. 4,554,839
EP 140,247 05-08-85				
Hewett, Atwood, Wennberg	Multiple Trough Vessel For Automated Liquid Handling Apparatus			
2120	10-14-83	542,113	Issued	12-03-85 as U.S. 4,555,957rx
EP 138,205 04-24-85				
Frankel, Johnson, Wennberg	Bi-directional Liquid Sample Handling System			83-013
2121	10-26-83	545,757	Issued	11-04-86 as
U.S. **D286,570**				
Williams	Pipette Tip Design			
2151	10-01-84	656,234	Issued	07-21-87 as U.S. 4,681,742
2151A	07-24-86	889,797	Aband	12-28-87
2151B	12-28-87	140,888	Issued	08-28-90 as U.S. 4,952,518
WO 86/02168		06-27-86	EP 198,872 10-29-86	
Johnson, Coates, Loor	Automated Assay Machine And Assay Tray			
2180	06-12-85	743,798	Issued	03-10-87 as U.S. 4,648,529
Blakemore, Hanamoto, Williams				
Dispensing Apparatus for Storing Draining, and Dispensing Beads				84-038

2186 10-23-84 663,882 Issued 05-06-86 as U.S. 4,586,546.
Mezei, Reeves, Leath, Widunas Improved Liquid Handling Device And Method

2244 10-18-85 788,998 Aband 06-23-87
2244.1 09-11-86 906,101 Issued 10-10-89 as U.S. 4,873,633
User Controlled Off-Center Light Absorbance Reading Adjuster in a Liquid Handling and Reaction System
2244.1A 03-10-89 321,757 Aband 10-10-89
EP 219,805 04-29-87 SR 05-10-89
Mezei, Albom, Coppock, Moehle, Noorda, Widunas, Zeitlin
Computer Directed Liquid Handling And Reaction Characterization System

2264 02-25-86 833,368 Aband 12-11-89
2264A 12-11-89 449,136
Johnson, Leath, Wennberg, Mezei Apparatus and Method for Performing Automated Amplification of Nucleic Acid Sequences and Assays Using Heating and Cooling Steps
86-049, 85-114.
2264.1 08-22-86 899,061 Methods
2264.1A 03-14-90 494,174 Apparatus
EP 236,069 09-09-87 SR 9-25-89 and 7-13-90
Johnson, Widunas

2291 04-16-86 852,910 Issued 08-02-88 as
U.S. 4,297,054
Williams Pipette Tip

2304 06-20-86 877,026 Issued 04-25-89 as
U.S. 4,824,641
Williams Carousel And Tip

PECI The following PCR Intellectual Property is being prosecuted by Seller in the name of PECI and enures to the benefit of Purchaser as the assignee of Seller's interest in PECI

2591 12-20-90 630,899
McCallum, Piccone, Zoccoli PCR Primers for Detection of Legionella Species

---

2606 01-19-90 467,813
Bej, Mahbubani, Miller, Atlas, Steffan Process for Detection of Water-Borne Microbial Pathogens and Indicators of Human Fecal Contamination in Water Samples and Kits Therefor
from U. Louisville **[Note: Louisville license listed on subsection (4) of Schedule 2.1(d)]**

2507 11-29-90 620,606
Mossa, Goven, Atwood, Williams, Woudenberg, Margulies, Ragusa, Leath
Thermal Cycler for Automatic Peformance of the Polymerase Chain Reaction with Close Temperature Control
2507.1 03-14-91 670,545
Atwood Thermal Cycler for Automated Performance of the Polymerase Chain Reaction with Close Temperature Control with Large Disposable Reaction Tube

---

2569 10-23-90 601,840
Cunico, Dollinger, Kunitani An HPLC Light Scattering Detector for Biopolymers

---

2605 06-06-91 712,904
Bej, Mahbubani, Atlas An Improved Process for Detecting Giardia and Other Water-Borne Pathogens

90-095
Assigned to PECI

2606 01-19-90 467,813
EP 438,115 07-24-91
Bej, Mahbubani, Miller, Atlas, Steffan Process for Detection of Water-Borne Microbial Pathogens and Indicators of Human Fecal Contamination in Water Samples and Kits Therefor
from UL to PE, but should be PECI

FOREIGN FILING

	AU	CA	DK	EPO	FI	GR	EI	IR	J	NZ	N	PCT	ZA	K	ES	US	
2007.1	I	I	A	I				I	P				L		L	IP3	
2144.1	L	A	A	AP2				L	P				L		L	I6	
2148.1	I	I	A	L				L	P				L		L	I	
2177.1	P	I	P	P			P	I	P	I			I	I	I	I	
2177.2	P	P	P	G			P	P	P	I			I	P	I2	I2P1	
2240.1	I	I	A	P	A				P							I	
2258	L	P		A					P							I	
2261.2	G	I	P	P			P	A	P	I			I	P	P	IP2	
2262.1	I	I		P					P2							A	
2264.1	P2	P	A	P		P	P	I	P	I				P	P	P3	
2303.1	A	P4	P	P	A	P	P	P	P4	I	P		A	P	P	I	
2303.2	A1	P2		I			P	P	P	A		NP	I	A	*	P3	
2313		P														A	
2313.1		P		I					P			NP				P	
2321		P		P		P			P						P	P	THAI, INDO
2322		P										NP				P	
2335A		P													*	P	
2425.2	P	P		I			P	P	P			NP			*	P	
2439.1	P	P		I			P	P	P			NP				P	
2454	P	P		I					P			NP				P	
2472.2	P	P		I								NP				P4	
2499		P							*			P				P	
2508.1	*	*		*					*			P				P	
2527.1	*	*		*					*			P				P2	
2532.2	*	*		*					*			P				P3	
2533	*	*		*					*			P				P	
2536.1	*	*		*					*			P				P2	
2537.1	*	*		*					*			P				P2	
2606	P	P		P	P				P	P					P	P	TAIWP

A-Abandoned, AU-Australia, BR-Brazil, CA-Canada, CN-China, DK-Denmark, EI-Ireland, EPC-Austria, Belgium, England, France, Germany, The Netherlands, Italy, Luxembourg (LU), Liechtenstein (FL), Sweden, and Switzerland. ES-Spain, FI-Finland, G-Granted, GR-Greece, HX-Hong Kong, HU-Hungary, I-Issued, IN-India, IR-Israel, J-Japan, K-South Korea, N-Norway, NZ-New Zealand, P-Pending, PCT-Patent Cooperation Treaty, RS-Singapore, US-United States, ZA-South Africa, *-Designated Country,

	EPO	AU	CA	DK	FI	GR	HX	EI	IR	J	K	FL	LU	NZ	N	RS	ES	US	
2099.1	I	I	I	A	A					P	A			I	I			I[RXD]	
2118	A	L	I	A	A					A				A	A			I	ABD
2119	A	L	A	A	A					P				A	A			A	ABD
2120	A	L	I	A	A					A				I	A			I	ABD
**2121	I	I	I	I	I					P	I			I	I			I	
2151	A	L	I	A	A					A	A				A			I[11]	ABD
2186			I															I	I
2235			I															A	
2264.1	P	P	P	A		*	P	P	I	P		*	*	I			*	P[1]	
2291			I															I	

A-Abandoned, AU-Australia, BR-Brazil, CA-Canada, CN-China, DK-Denmark, EI-Ireland, EPC-Austria, Belgium, England, France, Germany, The Netherlands, Italy, Luxembourg (LU), Liechtenstein (FL), Sweden, and Switzerland, ES-Spain, FI-Finland, G-Granted, GR-Greece, HX-Hong Kong, HU-Hungary, I-Issued, IN-India, IR-Israel, J-Japan, K-South Korea, N-Norway, NZ-New Zealand, P-Pending, PCT-Patent Cooperation Treaty, RS-Singapore, US-United States, ZA-South Africa, *-Designated Country,

** Expired in Austria

(2) Invention Disclosures [Note: Seller generally seeks patent protection for invention disclosures rated 1, 2 or 3. As patent applications are filed, these disclosures shall be deemed to be listed under subsection (1)]

Seller

Rated 1

2528.1 91-001, rcd1-91, Modified TaqMan Probes, Sninsky, and 91-008, rcd 2-91, Holland, and combined 3-13-91

2532.3 91-010 and 91-011, rcd 3-91, RT-PCR with UNG and in one step, Myers, r1 3-91

2580 90-045, rcd 5-22, 5'-3' Exo mutants, Abramson, rated 3 6-6-90, PCR-D mgt r2 on review; see 89-117; r1 8-1-90; on 10-3-90 said review again in 6 mos., see 2581-3

2598 Pub App? 90-091 rcd 11-2, G-gamma globin poly, Nasarabadi, r1 12-12-90, [filed 5/7/91]

2604 90-094, rcd 12-90, Allelic ladder, McClure, r1 3-13-91, r5 6-12-91, sent memo 6-18-91

2620 91-037 rcd 8-13, Amp RNA not DNA, Kwokrated 1 10-9-91

2621 91-042 rcd 10-9-91 R Renyolds DNA Quality Indicator note talk in May 1991

2623 91-040 Gelfand conserved motifs in polymaerase 5-3 exo domasiuns of thermostable DNA polymertases r 1 10-9-91

90-078 rcd 9-27-90, AmpliWax Scale Up Procedures, Phillips, r3 10-3-90, rated 1c 12-12-90, but did not include in 2527.1

Rated 2

2599 90-066, rcd 7-27, Homogeneous Methods for Nucleic Acid Amplification and Detection, Higuchi, r3 10-3-90, r2 12-12-90, (filed 5/2/91)

2607 89-117, Improvements in Polymerase Chain Reaction, Erlich rcd 10-9 (see 2558 and 2580, 90-045), r3 12-1-89, 6-6-90, 8-1-90, 10-3-90, 12-12-90, mgt r2, r2 3-13-91

2611 91-019, rcd 4-91, Gender Test for Zinc Finger Polymorphism, Reynolds, r2 6-12-91, memo 6-19 memo to T White 10-20-91

2622 91-028 rcd 7-9, Pyrodictium abyssum polymerase gene cloning, Gelfand rated 3 10-9-91

90-079 rcd 10-4, Stablzd UNG, Zoccoli and Akers, included in 2549.1, memo 12-12-90

Rated 3

2577 90-025, Varble Regn Primrs, Kwok and Sninsky, rcd 3-14-90, advised Roche, ltr 6-20; 90-048, rcd 5-30, flavivirus (HepC), consensus primers, Young; see Chiron patent EP 318,216; Combined 025 and 048 and r2 8-1-90; rerated 3 on 10-3-90; 90-088, rcd 11-14, HCV Detection, Young, include in 2577 12-12-90, r3 3-13-91

90-028 rcd 4-3, Beta-globin Size Markers, Scharf, rated 3 6-6-90, see 2529, rev 12-90, but forgot, reviewed 3-91, see if in 2529

91-006 rcd 2-91, Residual Small Cell Lung Cancer Detection, Kawasaki, r3 3-13-91 See PCT 89/08717 in Specific PCR Detection Methods

91-013 rcd 3-91, Taggant System, Phillips, r3 3-13-91

91-014 rcd 3-91, Triple Helices Detection, Kawasaki, r3 3-13-91

91-016 rcd 3-91, Primers as Taggants, Greenfield

91-029 d 7-9, SSB to amplify polymorphic sequences, Chou 10-9-19r3

91-030 rcd 7-9, Taq SSB, Chou 10-9-19r3

91-031 rcd 7-9 SSB to improve PCR Chou r 3 10-9-91

91-032 rcd 7-9, SSB conc. in PCR, Chou 10-9-19r3

91-036 rcd 8-13, HPV Probes, Bauer, r 3 10-9-91, ck kit

91-038 rcd 8-15, Genomic DNA Quant. Probes, Walsh, r 3 10-9-91 ED to follow up

New Disclosures

91-043 rcd 10-10, Detection of Degenerate Sequences Using Blender Degenerate Probes, Picone, McCallum

91-045 rcd 10-11, 5' Untranslated Region (5UTR) and First 269 nucleotides of the capsid gene of Novel Hepatitis C Virus Variants

PECI [please refer to headnote in subsection (1) above regarding PECI interests]

Rated 1

2592 Rapid small-scale T.C. letter from Seyfried of 10-2-90 with disclosure from Haff dated 8-9-90, to Ron Fish 10-90 with disclosures 89-013 and 90-044, which had been rated 5, and disclosures: 88-072, r3, and 88-092, Rated 1, 12-12-90 and 3-13-91

2605 90-095, rcd 11-90, PCR Giardia, Atlas, r3 12-12-90, memo PECI, r1 by Zoccoli 2-91 and confirmed 3-13-91, to kaw 4-91

2606.1 90-096, rcd 11-90, Coliform Probes, and combined with 90-097, rcd 11-90, Concentrating Cells, Atlas, r3 12-12-90, memo PECI, r1 and told to file as CIP of Bej et al. on 3-13-91, to kaw 4-91

Rated 3

91-004 rcd 2-91, Improved Light Scattering Detector (see 2569), Dollinger, r3 3-13-91

New Disclosures

91-021 rcd 4-91, Fast LC Gradient Maker, Atwood

Seller does not generally pursue patent protection for invention disclosures rated 4 or 5 but such disclosures may contain proprietary, useful knowhow.

Rated 4

Seller
Case #

2373 86-105, Diff of DNA from spliced mRNA in PCR (see 2423)
2462 88-006, Amp Antibody Sig PCR, Kawasaki, Rated 4 in 10/88 (tfer, see 89-131)
2476 88-081, Assay apparatus. Chang
2530 89-064, PCR detection: optical localizn of fluorescent detection zone,
83-019 CIC, Method for Detmng Ab subclass, Ring
86-105 2373, Diff of DNA from spliced mRNA in PCR (see 2423)
86-143 Cleavable biotinylated psoralens--**Check** status
88-006 2462, Amp Antibody Sig PCR, Kawasaki, Rated 4 in 10/88 (tfer, see 89-131)
88-055 Thermostable ligase in Ligase-mediated amplification
88-081 2476, Assay apparatus. Chang
88-094 Rapid Detection of Bacteria in Mammalian Serum
89-012 Scanner for Quantitating Electrophoretic Gels, Bloch, r4 2-90
89-031 Use of Assym PCR for Quantitative PCR, Bloch, Cip of 2444, R4 8-89
89-035 Tracking Cancer, PCR, Groves, R4 8-89 memo?, called instead -- usual way of dtn
89-039 In Situ PCR, Wang
89-059 Two new spectroscopic methods for the detection of amplification, Dollinger
89-062 PCR optimizer kit, McKinney
89-090 Peroxidatic Storage Stable Detection Reagent, Bloch, r3 9-25, rated 4 6-6-90
89-116 Det'n of xsome X DNA, Erlich 10-9, r4 12-1-89
90-033 rcd 4-18, Meth for Assay Mult Probe Strips, VP, r3 6-6-90; r4 8-1-90
90-061 rcd 6-6, Thermally activated primers, Sninsky, r3 8-1-90, r4 10-3-90

Rated 5

1050 Solid Phase RCB Typing, Erlich
1056 Thiophosphase Nucleic Acids, Nunberg
1060 Juvenile Onset Diabetes, McDevitt
1153 Rapid Enz. Detn. of Nucleic Acids, Sheldon, Goodson
1192 Oncogenes for Diag/Ther, Mark, Loor
1203 Electrophoresis Device, Sheldon
1222 Mult. Immob. Seq. for Simult. Detmn. of Targets, Paau
1233 Laser-induced Fluorescence Assays, Platt
84-014 **2388**, Bio-chem. Bridge Crane, Johnson, R4 by 103 on 5-30-88, ck 87-099
84-017 CIC, 8 channel Head, Ely
84-034 **2202**, Software for Stepper Motor, Johnson, 6/85
85-002 Level Sensor, pressure, Leath, but see 2209
85-011 **2208**, Watson, DNA probe, no ID, before me ck to see if 84-011
85-030 CMC, Thio-nucleotide probes, Paau
86-004 Sanger Seq. System, Innis
86-006 Clone Picker, Atwood
86-008 Assay for Pathogens via PCR with nested primers, Sheldon
86-015 **2386**, Histo Slide Clip, Atwood, R4 by 103 on 5-20-88

86-023 2320, Immunoassay for Gonorrhea, Laird
86-056 Photo Emission Detection System, Goodson
86-070 Degenerate Primers, Sninsky, Mack
86-084 CMC, Smooth-faced Cap, Bowman
86-085 CMC, Pipet Stand, Bowman
86-086 CMC, Magnet Cap for Pipet, Bowman
86-091 2278, 2323, An Imp Process for Mnf of Covalent Conj of Streptav, Bloch, 10-88
86-101 CMC, Pipet Dispenser, Bowman
86-144 2356, 2177.4 duplicate WATSON R4?
87-018 2455, DNA Assay by Enzyme Modulation, Sheridan, r3 8-89, r5 12-1-89
87-099 2388, Bio-chemical Bridge Crane, Johnson R4?, ck 84-014
87-101 Vector specific primers, 3/27
87-181 2531, rcd 12-87, Novel Taqs, r1 8-89, r2 4-90+ 6-6-90, r5 8-1-90, inc w 2570
88-015 2475, Dot-blot apparatus. PCR Mgt rated 5a 5/89
88-018 2448 PCR VNTR , Erlich, Horn
88-023 2449, Sample-swab extrn chamber. PCR Mgt rated 5a 5/89
88-083 Viral DNA amplification, 3/27
88-089 Homogeneous assay for PCR products, 8-89
88-090 2477 Prostate Cancer and HPV, Fox and Manos, see 2472.1
88-095 2497, Method for encryption/decryption, White
88-110 FHV MCP gene by PCR, R5 or transfer to 106, 5/89
88-112 2558, HRI--Anneal/Denat T for PCR, Cimino, 2-90, r1 6-6-90, mgt r5 8-1-90
88-114 QuantPCR/BlockOligo (see IL-7948), Groves, r3 6-6-90, r5 8-1-90
88-125 2501, PCR in insect cells (104), r1 (from r2) 12-89, r2 2-90, r5 4-4-90
89-007 (101) Improved Chemistry for Scintillation Proximity Beads, 3/27
89-011 Bar-code Design for Diagnostic Test Strips, Bloch, r5 2-90
89-013 Device for Preparative Scale PCR, Bloch, r5a, after PE input, 8-1-90 (see 90-044)
89-019 Integrated PCR and DNA Detection, Higuchi, 8-89
89-023 Primers for PCR Sequencing (101), McCabe, r5 2-90
89-029 PCR Machine and Process (Konrad), 8-89
89-030 Malleable Primer-Polymers, Chang, 8-89
89-036 Blood Samples, PCR, Bloch, rated 3 6-6-90, review 12-90, but forgot, r5 3-91
89-038 Quant PCR-HPLC, Bloch, note ad by Waters, rated 5 4-4-90, ClinChem36(6)900
89-040 CMC Pipet Tip (105), r5a 12-90
89-069 UNTITLED, Raymond, 8-89
89-091 Solid Sup Meth, Bloch, r3 9-25-89, 6-6-90, 8-1-90, see 90-046, r5 no int 10-3-90
89-092 Psoralen Based Detectn Method, Bloch, r3 9-25, rated 5 6-6-90
89-095 Improved meth/comp for strlzn of PCR, Bloch, r3 9-25, rated 5 6-6-90
89-097 Forensic Kit tray, Lemke, r5 9-25
89-100 2538, PCR rabies, Kawasaki, r2 9-25, 6-6-90, mgt r5, Roche advised 6-20
89-104 Cl- buffers for PCR, Griffith r3 9-25, r5 12-1-89, but see 2529
89-113 Cleavable primers, Zoccoli, 10-6, r3 12-1-89, see 2549, r5 4-4-90
89-120 2552, HIV Integration Assay, Kriegler, rcd from 101 in 10-90, r5 ts 10-3-90
89-123 PCR Diag Follicular lymphoma, Kawasaki, r5a and sent to Roche 5-90, conf. 8-90
89-118 PCR-cystic fibrosis, Kawasaki 10-9, r3 12-1-89, r5, 2-90
89-126 Improved length PCR, Mezei + Picone, r3 12-1-89, r5 2-90
89-131 Multiple DNA Tagged Antibodies, Ring, r3 12-1-89, r5 or tfred to 101 4-4-90, 6-6
90-003 Quant of HIV DNA, Konrad rcd/r3, 2-90, rated 5 4-4-90
90-008 2560, HSV, Manos. rcd/r2 2-90, r2 6-6-90, mgt r5, Roche 6-20; r5 8-1-90
90-009 Solvents in PCR, Manos, rcd/r3, 2-90, rated 5 4-4-90
90-010 2561, CMV, Manos, rcd/r2 2-90, r2 6-6-90, mgt r5, Roche 6-20; r5 8-1-90

90-026 Mock HIV fragment, Konrad, rcd 3-22-90, r3 4-4-90, rated 5 6-6-90, see 88-114
90-034 rcd 4-19, DNA Hyb Buffer, VP, rated 5 6-6-90
90-035 rcd 4-19, Imm. Prbe Mem Mnfr, VP, r3 6-6-90, r5b by PCR-D mgt on review
90-036 rcd 4-19, Inst for Automated Probe/Memb Mnfr, VP, r3 6-6-90, r5b by mgt 8-3-90
90-037 rcd 4-19, Redn Membrane Waste, VP, rated 3 6-6-90, r5b by review PCR-D mgt
90-043 rcd 5-21, Aggregate Assay, VP, r3 6-6-90, r5a 8-1-90
90-044 rcd 5-21, large volume PCR, VP, r3 6-6-90, rqstd PE info ltr of 7-3-90, r5a 8-1-90
90-050 rcd 6-1, DNA w modfd linkage, Greenfield, r3 6/90, 8/90 (2499), r5pub 10-3-90
90-059 rcd 6-19, DNA Computers, Dollinger, r3 8-1-90, did not review 12-90, r5 3-91
90-060 rcd 6-19, Mycobacteria, Young, r3 8-1-90, Roche 8-14 ltr, r5 pub 10-3-90
90-063 rcd 7-24, Oligo-plus, DNA-free polymerase, Bloch r3 8-1-90, r5 no int 10-3-90
90-064' rcd 7-24, Mol Wt std ladders, Bloch, r5a 8-1-90
90-065 rcd 7-26, Retrograde electrostaining, Bloch, r5 pub 10-3-90
90-093 rcd 12-90, Gel box, McClure, r5b 12-12-90
91-027 rcd 7-2, Development of PCR Primers and Probes for the Analysis of Mutations at the Human P450IID6 (CYP2D6) Locus, Phipp, Kawasaki
2460 LL IL-7859, UC 87-205-1, Det'n of Chrom. Rearrangements, Joe Gray, R5 8-89
2461 LL IL-8093, 7859, UC 88-187-1, Fluor. Primers - Quant. PCR, J. Gray, R5 8-89
2478 Steinman, T Cell Receptor Gene and MS/MG. Pub App 88-153
2479 HLA and NPC, Simons, 3/27
2584 Pyrococcus furiosis, PCR-D athzd filing 6-29-90, to D.Highet 7-2-90; r5 3-13-91
2585 Pyrodicteum occultum, PCR-D athzd 6-29-90, to D.Highet 7-2-90; r5 3-13-91

(3) Abandoned Cases [Note: Abandoned cases are listed because such cases may contain useful, proprietary knowhow.]

Seller Case #		
2005.1A	USA	Abandoned 8-23-88
2006.A	USA	f07-19-82, SN 399,528, Aband
2006.B	USA	f02-22-84, SN 582,361, abd 4-90, adv. Bd, (APH ltr 4-24)
2007	DEN	102 of 10-90 said don't pay fees, abd ltr mld 12-90
2007.2A	USA	f8-88, IDS, PA filed 6-90, amd d12-17-90, abd
2099.1	DEN	Amd due 2-25-90, abd 10-90
	KOR	told not to pay ann 8-90, goes abd 11-30-90
	NOR	Amd fxd 12-1,3-9,4-5, grant 5-10, fees 8-29, new rjn so abdn 9-89
2118	DEN	told not to pay ann 8-90
	EPC	Amd m1-89, ack 51(4) m8-24-89, grtd 3-90, did not pay fees 10-90
	FIN	Amd due 4-12-90, abd 2-26-90
	JAP	abd 8-90
	NOR	Amd due 10-6-90, abd by fax of 8-10-90
2119	DEN	abd ltr sent 9-90
	EPO	Enter Ntl phase, B2 pub 8-9-89, did not pay fees 10-90
	FIN	Amd due 4-12-90, abd 3-5-90
	NOR	Amd due 7-89, abd 6-89
	USA	10-13-83; 541,678; abd 06-11-85; EP 148,333, 07-17-85
2119.1	USA	01-15-85; 692,015; abd 08-25-86
2119.1A	USA	08-15-86; 900,240; abd 03-08-88
2119.1B	USA	03-03-88; 164,073; abd 9-27-90
2120	DEN	abd ltr sent 9-90

	EPC	pub for opposition 12-27-89, did not pay fees 10-90
	FIN	Amd due 4-12-90, abd 2-26-90
	JAP	Amd due 9-19-90, abd 8-6-90
	NOR	amd due 9-25-90, abd 8-6-90
2144.1	CAN	Amd m11-14, Amd d9-90/m9-6, abd 11-90
	DEN	sent abd ltr 10-4-90
	EPO	memo 5-90, ext 9-26, abd ltr 10-5-90
2144.1A	EPC	Rqstd Exmn 3-89, conform txt d12-90, abd ltr sent 10-5-90
2146	ALA	Amd mld 12-1, allwd 5-89, amd 1-90, abd 3-90
	DEN	did not pay tax 1-90?, abd 3-90
	EPC	Al filed Amd, amd due 7-89, fxd 7-28, abd 3-90
2148	DEN	did not pay tax 1-90? abd 2-90
2151	ALA	DIV, Rqst Exmn, memo 1-11, athzd ABD 5-90, but went 3-90
	DEN	abdnd 7-10-90
	EPO	Amd 10-89, apprvd 2-8-90, abdnd 7-10-90
	FIN	abdnd 7-10-90
	JAP	to be abdnd, abd ltr sent 10-4-90
	NOR	to be abdnd, abd ltr sent 10-4-90
	SKO	Rqst Exmn, told KJ to abdn 4-20, mld 4-23
2167	USA	Filed R62 (2167C) in 8/88
2177	NIGE	Confirm Abdnd
	OAPI	Confirm Abdnd
	ZAIR	Confirm Abdnd
	ZIMB	Confirm Abdnd
2177.2B1	USA	R62 f8-9-89, IDS 11-8-89; PrAm,IDS,pwr 6-90, amd d12-90, abd
2177.3	USA	Amd, Abandon, 3/27
2182.1	DEN	Abd 6-27-90
	AUS	Abd 6-27-90
2194	CAN	09-28-90, Amd, abd 7-25-90
	DEN	abd ltr sent 9-90
	FIN	abd ltr sent 9-90
	EPO	Iss fees due, auth to abd 4-90, fxd abd ltr 5-18-90
	JAP	abd ltr sent 10-4-90 but no fees due
	KOR	confirmed decision to abdn on 6-22-90
	NOR	Amd due 10-22-89, abdn 8-31-89
	USA	12-18-84; 683,264; abd 01-23-87; EP 185,330, 06-25-86, ff 2198
2194A	USA	01-14-87; 003,073; abd 01-19-88
2198	USA	12-18-84; 683,066; abd 11-07-85
2209	USA	07-05-85; 752,449; abd 04-20-88
2225	USA	05-29-85; 738,847; abd 02-07-87
2225.1	USA	01-07-87; 000,921; abd
2228	ALA	Abd 10-89 -- all foreigns abandoned
	CAN	09-24-90, Amd, abd 7-10-90
	EPC	Abd 1-89
	JAP	Abd 10-89
	USA	3-19-86, 841,155, r62 12-22-88, 289,508, abd 10-10-89, EP 238,332, 9-23-87, Goodson, Sheridan, ID 85-012.

2232.1	ALA	Amd due 6-20 (Acc. date), abd 6-89
	CAN	Amd due 12-15, faxed 11-16, abd 6-89
	DEN	no pay fees 5-7-90, abd ltr sent 7-90
	EPO	Amd d12-89/ext,m2-89, no pay fees 5-7-90
	FIN	no pay fees 5-7-90, abd ltr sent 7-90
	JAP	abd ltr sent 10-4-90 but no fees due
	KOR	abd ltr sent 10-4-90 but no fees due
	NOR	no pay fees 5-7-90, abd ltr sent 7-90
	NZL	Accptnce date 4-12, Abd 4-89
	USA	RR d6-9-90/memo to PECI 6-90, ID 84-108 abdnd 11-9-90
2232	USA	07-08-85; 753,005; abd 02-21-87
2232.1	USA	10-18-85; 789,945; abd 09-21-87; EP 210,014, 01-28-87
2232.2	USA	09-21-87; 099,391; abd 11-09-90
2235	USA	07-29-85; 760,273; abd 09-23-86
2235A	USA	09-17-86; 910,282; abd 11-4-90
2238A	USA	Abd 1-89
2240.1	DEN	fees pd to 10-91, abd after that
	FIN	fees pd to 10-91, abd after that
2244.1	AUS	Amd due 12-89, abd 9-89
	CAN	Amd, abdn, memo 3-28, abd fax 4-19, confirmd 4-20, -24
	DEN	abd ltr sent 9-90
	EPO	Rqd Exmn 9-89 abd ltr sent 9-90
	FIN	abd ltr sent 9-90
	JAP	abd ltr sent 10-4-90 but no fees due
	KOR	abd ltr sent 10-4-90 but no fees due
	NOR	abd ltr sent 9-90
	NZL	Granted case abd 4-89
2244.1A	USA	amd d7-10-90, abdn 10-10-90
2244.1B	NZL	Div filed 11/88, abd 4-89
2256	USA	f10-25-85, SN 791,323, abd 10-19-87 (see 2144.2), Levenson, Sheldon III, Rapoport, Watson; Labeling Reagent for Nucleic Acids
2258	EPO	SR 8-89, rqstd exmn 9-89, sent abd ltr 1-91
2261	ISR	10-30-90, Amd, abd fax 8-6-90
	USA	Abandoned 10-28-88
2262	USA	Amd due 10-15, Mailed Power 6/20 and then abdn for 2262.1
2262.2	USA	abd 2-14-91
2264.1	DEN	102 Com said not to pay fees 10-3-90, abd ltr mld 12-90
2273	USA	Fin Rej d5-90, athzd to abdn 5-90, abdnd 9-6-90
2290	ALA	Abdn 8-89
	CAN	Abdn 8-89
	EPC	Abd 1-89
2290A	USA	Amd d11-2/R62f2-89; athzd abdn 4-90, amd d7-23-90/abd10-23-90

2303	AUS	No. 77298/87, Rqex11-88, pat add+ .2, abd 10-90; see 2303.2A
	BRA	Abd 6-27
	CHI	Rqst Exmn 8-22, abdn 8-7
	FIN	Sent clarity letter on 6/14, sent art on 3/26-89, abd ltr m9-90
	HUN	Amd d10-26-90, abd ltr m11-90, abd 1-26-91
	IND	Amd due 7-89, abd 7-89
	SAF	Abd 6-27
	USA	Amd due 10-18, abd for cip
2303.2	ALA	No. 30629/89, NtlPh/pat addn m12-19, goes abd 1-91 for .2a
	SOK	ntl due 9-12-89, decided not to enter ntl phase, 7-89
	USA	exp abd for .2C 8-16-90
2313	USA	Amd (cite PCT/EP art rcd 5-89), abd 12-29 for cip
2321	CHI	Rqst Exmn 11-26-89. sent letter to SUNY 9-89, abd fxd 11-20-89
2354	USA	07-12-90, RR, Amd, abd memo and Lanny ltr mld 3-90, ABDND
2355	PCT	f8-16-88, SN88/02807, PCT 90/02202, 03-08-90, SR 3-1-89
		Bloch, Birch, Reduction of Peroxidatic and Catalatic Interference with Assays of Peroxidatic Activity, 86-135, 87-100, no NtlPh
2374A	USA	Abd 1-05-91, Amd d10-5-90, IDS d3-20-90, abd
2381	USA	Amd m2-90, FR m7-90, FRwd, amd m10-90, FR d2-91, abd5-91
2404.1	USA	f11-89, ids m7-90, PCRmgt said abdn 8-90, Amd d12-27-90, abd
2387	CAN	abdn ltr sent 10-5-90
	IRE	abd ltr sent 10-5-90
	PCT	08-08-90, Ntl Ph Ala/Dn/Jp/No/EPC, auth to abdn 4-90, ABD ALL
	USA	07-22-90, Amd, memos 1-30 and 3-30, auth to abdn 4-90, ABDND
2404	USA	f4-6-88, SN178,202, amd d8-89, cip f11-89, petrev 11-89
2404.1	USA	f11-1-89, SN430,329, Higuchi, NA Prep Sols, 87-138, abd3-91
2425	USA	mDOE, IDS m6-90, amd d11-27-90, new dec m11/90, abd 2-27-91
2425.1	USA	f10-88, IDS m6-90, amd d9-6-90, went abd 12-6-90
2445	USA	f8-5-88, abd 2-14-91, SN229,128, PCR on Single Sperm
2456	USA	f6/6/88, SN203,000, amd d6-90, abd 9-26-90
2459	USA	f6/6/88, SN203,228, athzd to abdn 5-90, amd d12-18-90, abd
2464	USA	08-08-90, Amd, abdn memo to Upjohn, PCRD 3-90, ABDN
2473	USA	f10-88, amd m4-90, FR m8-90+10-90, ApBr d2-91, abd
2508	USA	Filed 8-21-89, IDS m2-90 (Dec,Ass,DOE all mld), abd 3-14-90

(4) All PCR Technology in subsections (1), (2) and (3) above, that is contained in the following documents to the extent of Seller's interests:

(1) PCR Quality Assurance documents listed on Attachment A to this Schedule 2.1(c), and

(2) all files, book and records and laboratory notebooks of the PCR Business, including such documents of the employees of Seller's PCR Division listed on Schedule 4.14(a).

(5) Seller's rights to intellectual property under agreements set forth in Schedule 2.1(d).

(6) Seller's rights to trademarks and trademark applications to the following (as listed on Attachment B to this Schedule 2.1(c)):

AMPLITAQ
AMPLITYPE
AMPLIWAX
GENEAMP
GENEAMPLIMER
MICROAMP
PCR
PCR(service mark)
PRO/PETTE
PRO/PETTE EXPRESS
PRO/PETTER OVERDRIVE

SCHEDULE 2.1(d)

Transferred Contracts

(1) Seller Technology Agreements:

PCR Agreements between Seller and Purchaser and Seller and F. Hoffmann-La Roche Ltd., dated as of February 5, 1989.

Agreement between Seller and Eastman Kodak Company, dated February 4, 1986.

Other Seller Technology Agreements by field of use:

Research in Agriculture and Veterinary Medicine

Grace ASC Corp. - Stamford, CT dated 1/2/90

Human Diagnostics

Baylor University - Houston, TX dated 7/10/89

The Blood Center of S.E. Wisconsin - Milwaukee, WI dated 8/9/89

Collaborative Research, Inc. - Bedford, MA dated 1/29/90

Genescreen - Dallas, TX dated 4/21/89

George Washington University - Washington, DC dated 7/29/89

IG Laboratories - Framingham, MA dated 5/26/89
(assigned to successor entity by amendment dated 3/15/90)

Johns Hopkins Hospital - Baltimore, MD dated 7/1/90

Johns Hopkins University - Baltimore, MD dated 2/26/90

London Health Association - Ontario, Canada dated 10/26/89

Michigan State University - East Lansing, MI dated 3/19/90

Nichols Institute - San Juan Capistrano, CA dated 4/17/89
(addition of tissue typing to Field by letter agreement dated 7/19/89)

The Pathology Institute - Berkeley, CA dated 7/1/88

Scripps Clinic and Research Foundation - San Diego, CA dated 5/12/89

Simons GeneType Diagnostics, Inc. - Burlingame, CA dated 8/1/90

Specialty Laboratories, Inc. - Santa Monica, CA HIV: dated 6/3/88
Other: dated 3/13/89

University of California, Davis - Davis, CA dated 7/1/89

University of California, San Diego - La Jolla, CA dated 7/26/89

University of California, San Francisco - San Francisco, CA dated 3/16/89

University of Florida - Gainesville, FL dated 2/26/90

University of Southern California - Los Angeles, CA dated 2/21/89
(Ltr dated 5/91 clarifying infectious disease indications)

University of Virginia - Charlottesville, VA dated 2/26/90

Forensic Services

The Blood Center of S.E. Wisconsin - Milwaukee, WI dated 8/9/89

GeneScreen - Dallas, TX dated 4/21/89

Integrated Genetics dated 11/6/89

Simons GeneType Diagnostics, Inc. - Burlingame, CA dated 8/1/90

Federal Bureau of Investigation (FBI)-Washington, D.C. dated June 22, 1989

Genetic Design [redacted]

Human Identity (*Licenses for specific government contracts, 1-2 years.*)

Cellmark - Germantown, MD dated 2/91

Genmark - Salt Lake City, UT dated 2/91

Hoffmann-La Roche - Nutley, NJ dated 2/91

Production of Oligonucleotides

Oncor, Inc. - Gaithersburg, MD dated 9/1/90

Veterinary Services

Genmark, Inc. - Salt Lake City, UT dated 2/1/91

Granada Biosciences, Inc. - Houston, TX dated 1/1/90

Simons Genetype Diagnostics, Inc. - Burlingame, CA dated 8/1/90

University of California, Davis - Davis, CA dated 4/1/91

Veterinary Products

Idexx - Portland, ME dated 9/6/89
(an exclusive license for certain indications is under discussion)

A.B. Technology - Albury, Australia dated 11/1/90

Forensic Products

[redacted]

(2) Other Seller's Licenses relating to the PCR Business

HLA Probe

Oncor, Inc. - Gaithersburg, MD dated 11/17/88

Pharmacia Diagnostics AB dated 6/29/90

Native *Taq* DNA Polymerase

Boehringer Mannheim Biochemicals - Indianapolis, IN dated 9/1/90

Life Technologies, Inc. - Gaithersburg, MD dated 6/12/90

Pharmacia P-L Biochemicals, Inc. - Milwaukee, WI dated 7/1/90

Promega Corporation - Madison, WI dated 7/1/90

Stratagene, Inc. - La Jolla, CA dated 7/1/90

United States Biochemicals, Inc. - Cleveland, OH dated 4/23/90

(3) Sellers 49% undivided interest in PECI sublicenses of PCR Technology

Instrument

Applied Biosystems, Inc. - Foster City, CA dated 12/31/89

Kit

Applied Biosystems, Inc. - Foster City, CA dated 12/31/89

Clontech Laboratories, Inc. - Palo Alto, CA dated 11/1/88

Takara Shuzo Co., Ltd. - Kyoto, Japan dated 6/11/90

Primer/Probe with Protocol

Oncogene Science, Inc. - Manhasset, NY dated 8/20/90

Research Genetics - Huntsville, AL dated 7/1/90

Clontech - dated 10/1/90

Cambridge Research Biochemicals - Cambridge, UK dated 3/1/91

Genemed Biotechnologies, Inc. - San Francisco, CA dated 10/8/91

[redacted]

Primer/Probe

Integrated DNA Technologies, Inc - Coralville, IA dated 2/21/91

Pel-Freez, Inc. for Novagen, Inc. - Madison, WI dated 3/15/91

QA/QC Collaboration Agreements

Microbiological Associates, Inc.	October 1990
Tektagen	October 1990
Quality Biologics	October 1990