Curriculum Vitae

Robert A. Levine, MD

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Place of Birth: Brooklyn, New York

Personal Statement:

I am a physician, teacher, and scientist/inventor who loves both the science and the practice of medicine—both internal medicine and laboratory medicine. I am constantly looking for ways to improve the practice and delivery of medical care, especially in the field of point of care diagnostics.

I have been blessed by picking the right schools, Brooklyn College (CUNY) and Upstate Medical University, and having the right mentors, Dr. Herman Zieger and Dr. George Gibson at Brooklyn College, David H. P. Streeten at Upstate Medical College, Dr. Solomon Berson and Dr. Rosalyn Yalow at Icahn School of Medicine at Mount Sinai School of Medicine and Dr. David Seligson at the Yale School of Medicine. I picked the right spouse, Elana, the love of my life and wife of over 50 years, and I chose the right partner in business and science, Dr. Stephen C. Wardlaw at Yale, and chose a career that I love. I have also been extremely fortunate in being born to wonderful parents, who nurtured me and, thankfully, lived long enough to witness my success and share my happiness.

Together with my colleague, Steve Wardlaw, I have discovered and developed novel ways to meet important needs encountered in the course of our medical careers, and we have successfully patented and licensed those solutions so that they may enter the health care system. My particular expertise is in the field of diagnostic devices, with special emphasis on medical point-of-care testing, primarily in the hematology field and more recently the detection and quantitation of circulating cancer cells in the blood for purposes of diagnosis and therapeutic monitoring. I have also developed and continue to work on point of care hematoparasite detection methods for the technology deprived world as well as the developed world.

Patent covered products that I have invented and licensed have generated over one billion dollars in sales, which allowed my partner and me to fund our own research through royalties that we received, most of which was done in the unfinished basement of my medical office and some in Wardlaw's kitchen. Products based on our inventions have been or are being sold by Becton Dickinson and Company, Inc, IDEXX Laboratories, Inc., Tyco Corporation Inc., Medical Technology Inc., Access Medical, QBC Diagnostics, Inc., and Applied Precision/RareCyte, Inc. In 1999 we formed a new company, QDx, Inc., to commercialize some of our newer technology in the hematology field. The intellectual property of that company in the field of hematology diagnostics was sold to Abbott Laboratories, Inc., which is developing it with our active participation until 2017.

I continue to actively teach at the Yale School of Medicine while pursuing the development of a new hematology diagnostic platform with my scientists and engineers at QDx and Abbott Laboratories. My current interests, in addition to the above, include the development of a point of care test for the diagnosis of malaria. Additionally, together with my son Joshua, I'm working on development of a new means of

increasing the efficacy of certain pharmaceutical agents by harnessing the power of the placebo and developing a new treatment for the prevention of nausea and vomiting during pregnancy as well as for other neuro-olfactory triggered illnesses, such as migraines, panic disorder and possibly obesity/metabolic syndrome by reversibly decreasing olfactory stimulation.

It is a great deal of fun defining a problem, applying basic science, enlisting the aid of talented engineers, writing a patent and then selling it to large corporations to manufacture and distribute the product. It's even more rewarding to see the effects of the new inventions in patients around the world and even in close friends and family. For all of above I am grateful.

In summary, I love what I have studied and continue to study that which I love.

Education:

1961	Fellowship at Antibioticos, S.A. Leon, Spain. IASTE sponsored
1963	B.S. Cum Laude, Brooklyn College (City University of New York), Brooklyn, NY
1966	M.D. Cum Laude, State University of New York, Upstate Medical Center, Syracuse, NY

Postdoctoral Training:

Residencies and Fellowships

1966-68	Intern and Resident in Medicine, Mount Sinai School of Medicine, New York, NY
1968-70	Metabolism Fellow (Endocrinology and Nephrology), Yale University School of Medicine, New Haven, CT
1969-70	Research Fellow (Radio-immunoassay), Drs. Rosalyn Yalow and Solomon Berson, Mount Sinai School of Medicine and Bronx Veterans Hospital, Bronx, NY

Licensure and Certification:

State of Connecticut (current)

American Board of Internal Medicine

Academic Appointments:

1970-1988	Instructor, Assistant Professor, Associate Clinical Professor of Laboratory Medicine, Yale University School of Medicine, New Haven, CT
1970-1976	Director of Radio-Immunoassay Laboratory, Yale New Haven Hospital, Yale School of Medicine, New Haven, CT

1988-Present Clinical Professor of Laboratory Medicine, Yale University School of Medicine, New Haven, CT

Hospital Appointments:

1986-Present Attending Physician, Department of Internal Medicine (endocrinology), Yale New Haven Hospital, New Haven, CT

Professional, Administrative and Leadership Positions:

1970-2006 Private practice of primary care internal medicine and endocrinology, Branford and Guilford, CT

1976-Present Independent Inventor, Guilford, CT

1987-2005 Consultant, Becton Dickinson Corporation, NJ

1999-Present Founder and Medical Director, QDx Inc, Branford, CT

2005-2015 Chief Medical Officer, QBC Diagnostics, Inc., Guilford, CT

2008-2017 Consultant, Abbott Laboratories Inc., Point of Care, Princeton, NJ

2010-Present Founder and CEO, Callix Research Inc., Guilford, CT

Honors and Prizes:

1962 Avalon Scholar (four year merit based full tuition scholarship) to SUNY Upstate Medical University, Syracuse, NY

1965 Alpha Omega Alpha Medical Honor Society. SUNY Upstate Medical University, Syracuse, NY

1966 Stuart I. Gurman Award. Given at graduation to the student "who best exemplifies that living and learning go together" SUNY Upstate Medical University, Syracuse, NY

1984 I R-100 Award for Quantitative Buffy Coat Analysis. Presented to the inventors and companies for the 100 most significant technological achievements of that year. The technology enables a rapid simple performance of a complete blood count at the point of care for humans and animals. Chicago, IL

1991 R&D-100 Award for QBC Malaria Test. Presented for the 100 most significant technological achievements of that year. The technology enables the rapid detection of many additional hematoparasitic diseases such as babesiosis, filariasis, trypanosomiasis (congenital and AIDS associated Chagas Disease and sleeping sickness), and louse-born borreliosis (relapsing fever), at the point of care. Chicago, IL

1996 Eli Whitney Award, presented "to an outstanding individual in recognition of significant contribution to law or science" by the Connecticut Patent Law Association. New Haven, CT

2004 R&D-100 Award for Rare Cell Detection (circulating carcinoma cells). Presented for the 100 most significant technologic achievements of that year. Chicago, IL

2013 AACC international conference award for best abstract "Potential Utility of a Novel Image Based Hematology Analyzer for the Diagnosis of Malaria as Part of a Routine CBC." Houston TX

2016 Distinguished Alumnus Award, Upstate Medical (SUNY) Alumni Association, Syracuse, NY. "This award recognizes the extraordinary achievements and outstanding service of individual alumni who graduated more than twenty years ago. Candidates have been chosen for academic achievement, research initiatives, humanitarian efforts, outstanding service to their community, dedicated work for the Association/Foundation, distinguished teaching and/or outstanding work in industry and private practice."

Teaching and Mentoring:

1972-2016 Lecture entire Yale medical school class on urinalysis performance and interpretation as well as past lectures on point of care testing, renal function tests, fluid and electrolyte disorders.

2005-2014 Mentored and tutored medical students, from freshman year for two years, in the art and science of physical diagnosis and physician patient interaction at Yale School of Medicine.

2005-2016 Approximately 2-5 students expressed an interest, each year after my lectures, in learning about inventing as a career path, complimentary to the practice of medicine. Mentor many of these students long-term.

2010-2011 Supervised a laboratory medicine fellow in my laboratory for one year as his third year of fellowship. Co-authored/invented a patent in the field of hematology diagnostics.

2011-2013 Supervised a Masters' student from UCONN in my office and served as his thesis advisor for project on malaria diagnosis. Co-authored with Michael Jorgensen and Wardlaw an award winning AACC manuscript on malaria diagnosis performed as part of a routine CBC.

2015-present Mentoring past fellows, students, and colleagues from Yale on business development of medical diagnostic products.

Current Research

2008-Present Inventor and Development of a new hematology technology involving digital imaging and analysis of undiluted blood. This technology that I co-invented with Wardlaw has been sold to Abbott Laboratories. Research continues post Abbott at my laboratory in Branford, Connecticut where I continue to work developing

new applications for the technology and improving the performance of existing applications. Current topics are: point of care, chemical analyte detection utilizing optodes, development of means of preventing nuero-olfactory triggered illnesses and conditions.

2009-2014 Consultant in Scientific Affairs to RareCyte, Inc. a division of Applied Precision, Inc., concerning the development of the detection of circulation cancer cells. This technology, recently acquired from us by Rarecyte Inc./Applied Precision, Inc., involves the application of technology/patents that I developed jointly with Wardlaw, Dr. Paul Fiedler and Dr. David Rimm, all Yale associated. Product is now used for research purposes for "liquid biopsies."

2010-2017 Invention and development of a novel means for handheld malaria diagnostic involving the detection of hemozoin in unstained, whole blood.

2010-2017 Currently developing a means for hematologic analysis for birds and reptiles and several mammalian species. This work was done at my laboratory in Branford, Connecticut and was funded by Abbott Laboratories, New Jersey.

2011-Present Development of a treatment for nausea and vomiting of pregnancy as well as other neuro-olfactory triggered illnesses and conditions. A patent has issued in Europe and in the United States.

Selected Invited Lectures (non-corporate):

1972 West Point Military Hospital, US Army, West Point, NY. Grand Rounds for the Medical Staff, *Radioimmunoassay, A Description of the Technology*

1982 Upstate Medical Center, State University of New York, Syracuse, NY. *Medical Grand Rounds, Radioimmunoassay, A Review of the Technology*

1989 Hiram College, Hiram OH. *Quantitative Buffy Coat Analysis for Avian Hematology and Successful Inventing Using Biology as a Metaphor*

1995 – 2016 Yale School of Medicine, New Haven, CT to selected students interested in inventing. Multiple lectures on creativity and commercialization of inventions

1998 MIT Media Laboratory, MA. *Improving World Health and Alleviating Human Suffering*

1998 Columbia University School of Business, New York, NY. *Successful Inventing Using Biology as a Metaphor*

1999 circa Upstate Medical Center, State University of New York, Syracuse, NY. *Medical Grand Rounds, Quantitative Buffy Coat Analysis, a New Technology for Point of Care Hematology, A Review of the Technology*

2000	Battelle Memorial Institute, Columbus, OH. *Rules for Successful Inventing Using Sex as a Metaphor* (Invited by Douglas Olesen, President and CEO)
2002	Medtech Insight Conference, Boston, MA. Keynote Lecture, *Rules for Successful Inventing Using Biology as a Metaphor*
2005	Worcester Polytechnic Institute & Clark University, Worcester, MA, *Rules to Follow to Become a Successful Inventor/Entrepreneur Using Biology/Sex as a Metaphor*
2006	Various Medical Schools & hospitals, India. Five lectures delivered *Diagnosing Hematoparasite Infections Using the QBC Technology*
2007	Central Military Hospital, Bejing, China. *History of QBC Technology*
2008	American Association of Clinical Chemists, Washington, DC. *Diagnosing Malaria and Tuberculosis using QBC Technology and the Paralens*
2008	The Howard Spiro Geezers Organization (Retired Yale Professors and Deans) New Haven, CT. *A Review of the Invention and Development of Quantitative Buffy Coat Analysis and Image Based Digital Hematology Analysis*
2009	SEAK, Chicago, IL. *Non-Clinical Careers for Physicians*
2009	Wheelock College, Cambridge, MA. *The Importance of Basic Science Education in Developing New Medical Technologies*
2010	Wildlife Conservation Society, Bronx Zoo, Bronx, NY. *A New Method for Performing Hematology in Zoo Animals*
2010	Brooklyn College (City University of New York), Pre-Medical Society Career Conference, Brooklyn, New York. *Inventing and Creativity.*
2011	United States Military, Fort Detrick, MD, *A New Robust Compact Non-Fluidic Technology for Haematological Analysis and Malaria Diagnosis*
2013	Penn State University, State College, PA. *Diagnosing Malaria, the Disease, Rather than Malaria, the Infection. The Role of Hematology Results in Improving Patient Care*. Presented to the Nigerian National Malaria Control Program and students and faculty of Penn State and the Penn State Hershey College of Medicine
2013	Yale School of Medicine, New Haven, CT. *An Image-Based CBC Solution for Near-Patient Care*
2013	Loma Linda University, Loma Linda, CA. *An Image-Based CBC Solution for Near-Patient Care*

2014	The Howard Spiro Geezers Organization (Retired Yale, UCONN and Quinnipiac Frank Netter School of Medicine's Professors and Deans) North Haven, CT. *A Review of the Invention and Development of Quantitative Buffy Coat Analysis and Digital Hematology*
2015	NASA Johnson Space Center, Houston, TX. *A New Method of Performing a Complete Blood Count that Functions in Zero Gravity Environments*
2016	Distinguished Alumni Award Acceptance Lecture, Upstate Medical University (SUNY), Syracuse, NY.
2016	Lecture to students and faculty, Upstate Medical University (SUNY), Syracuse, NY, "*Rules for Successful Inventing for Physicians and Scientists Using Sex as a Metaphor.*"

Selected Commercial Applications of Invented Patented Technology:

QBC	Manual hematology analyzer used by point of care physicians in offices. The QBC stands for Quantitative Buffy Coat. It expands the buffy coat in a centrifuged capillary tube containing a precise inserted float that comes to rest on top of the packed red cells. The expansion allows the measurement of the packed layers of buffy coat. A novel densimetric hemoglobinometery method was developed to obtain a very accurate hemoglobin concentration as well as the hematocrit thereby allowing the calculation accurate red cell indices, as described by Wintrobe.
QBC-V	Manual Hematology analyzer used by veterinarians physicians in offices
AUTOREAD	Automated hematology analyzers used as above plus used by United States Military in Operation Desert Storm as well as in many United States Embassies
QBC+	Also known as Expert System, the QBC+ is a hematology analyzer that contains a powerful expert system that analyzes the hematology results of hematocrit, hemoglobin, WBC, absolute and percent granulocytes as well as absolute and percent lymphocytes plus monocytes as well as the platelet count and lists all physiological conditions and pathophysiological conditions and diseases that fit within the domain of the results. The results are listed in abbreviated form or detailed text book like form and in most recent form divided by gender and age including twelve different age groups in the neonatal and paediatric range. This work was done over a several year collaboration with Professor Maxwell Wintrobe of University of Utah Medical School and Professor Howard Pearson of Yale school of Medicine
STAR QBC	An automated hematology analyzer that combines centrifugation and reading. It is used in physicians' offices, since 2013 employed by United States Navy on all nuclear submarines and large ships and is widely used on commercial cruise ships.

HEMAWIPE A device for collecting and analyzing fecal samples by wiping after defecation used for checking for occult gastrointestinal bleeding

DIGIWIPE A device for collecting and analysing fecal samples after a digital rectal exam used for checking for occult gastrointestinal bleeding

QBC Malaria A system comprising a QBC Tube, A ParaViewer for holding the tube, and a Paralens, a device that converts a regular microscope to a UV Epi-illuminating microscope. This technology is used worldwide for the point of care diagnosis of many serious hematoparasitic diseases described above. India as well as Southern Asia and Africa are primary markets.

QBC RareCell RareCyte, Inc., Seattle, WA. Licences rights to this invention. The company has developed and is commercializing for the purpose of using it in their products (AccuCyte and CyteFinder) to detect, isolate and characterize tumor cells so that the potential response to chemotherapy may be monitored.

Interesting Future Applications of Invented Patented and Patent Pending Technology:

UFB This technology using digital imaging and a disposable hemocytometer chamber, described in patent permits the full CBC with about 28 parameters to be performed on a half drop of venous or capillary blood. It provides the full CBC and images of all cells. Publications are limited to patents to four posters that are in the public domain and available upon written request to my email (r.levine@yale.edu). I together with my partner, Steve Wardlaw, have been working on this for the past twenty years. It was sold to Abbott Laboratories, Inc. in 2008. It is now a fully developed product awaiting FDA clearance.

UFB Malaria This technology using digital imaging allows the detection of malaria and Babessia as part of the CBC. A description is available as above.

Anosmia/Nosmia Sensory Cue Enhanced Pharmacologic Efficacy and the Treatment and Prevention of Neuro-olfactory Triggered Illness and Conditions, such as nausea and vomiting of pregnancy, are both ongoing projects. Descriptions are available as above.

Publications:

Levine, Robert A., Doisy, Richard J., Streeten H.P.: The Effect of Trivalent Chromium on Glucose tolerance in Elderly Human Subjects. Diabetes 15:539-40, 1966.

Zieger, Herman, E., Levine, Robert A., Lasky, Edward M.: The Synthesis and Acid Dissociation Constants of Isomeric 1-Napthyl Naphoic Acids. Annalen der Chemie 705:1967 (German).

Levine, Robert A., Streeten, David H.P. Doisy, Richard J.: The Effect of Trivalent Chromium on Glucose Tolerance in Elderly Human Subjects. Metabolism 17:114-125, 1968.

Levine, Robert A.: Reversal of Polymyxin B- Induced Apnea by Calcium Chloride Journal of the Mount Sinai Hospital, Vol. XXXVI, o. 5, Sept.-Oct. 380-387, 1969.

Felig, P., Brown, W.V., Levine, R.A., Klatskin, G.: Glucose Homeostasis in Viral Hepatitis. New England Journal of Medicine: 283:1436-1440 (Dec. 24), 1970.

Sobrinho, L.G., Levine, R.A., DeConti, R.C.: Amenorrhea in Patients with Hodgkin's Disease Treated with Antineoplastic Agents. American Journal of Obstetrics and Gynecology 109: D No. 1, 135-139, 971.

Levine, R.A., Donabedian, R. K., Sobrinho, L.G.: A Simplified Radio-immunoassay for Human Pituitary Luteinizing Hormone in Serum. American Journal of Obstetrics and Gynecology 109: No. 1, 135-139, 1971.

Levine, R. A.: The Consumer's Point of View of the Role of the Clinical Chemist in the Practice of Medicine. Clinical Chemistry 10, No. 6:639, 1973.

McDonald, J., Levine, R.A.: Pattern Recognition in Laboratory Medicine. 4th Annual New England Bioengineering Conference. Yale University Press, May 7-8, 1976.

Wardlaw, S. C. and Levine, R. A.: Quantitative Buffy Coat Analysis - A New Laboratory Tool Functioning as a Screening Complete Blood Cell Count. The Journal of the American Medical Association 249: 617-620, 1983.

Wardlaw, S. C., and Levine, R. A., Spiro, H. M. and Johnson, C.: A New Sample Collecting and Testing system for the Detection of Occult Blood in Feces. Connecticut Medicine. Volume: March 1985.

Wardlaw, SC, Levine, RA: Quantitative Buffy Coat Analysis, A New Research and Clinical Tool Proceedings of the Second International Symposium on Advances in Hematology, Banff, Alberta, Canada 1985.

Levine, RA, Hart, AH, Wardlaw, SC: Quantitative Buffy Coat Analysis of Blood Collected from Dogs, Cats and Horses , JAVMA 189,#6:670-673, 1986.

Patton, CL, Spielman, A, Perrone, JB, Teklehamanon, A, Philppe, E, Zhang, Y, Levine, RA, Wardlaw, SC: Diagnosis of Malaria Using Quantitative Buffy Coat Tubes Proceedings of the 3rd International Conference on Malaria and Babesiosis Avency, France September, 1987.

Spielman, A, Perrone, JB, Teklehaimanot, FB, Balcha, A, Wardlaw, SC, Levine, RA: Malaria Diagnosis by Direct Observation of Centrifuged Samples of Blood Am J Trop Med Hyg 39,#4:337-342 October 1988.

Levine, RA, Wardlaw, SC: A New Technique For Examining Blood: Am Scientist 76:592-8 Nov- Dec 1988.

Levine, RA, Wardlaw, SC, Patton, CL: Detection of Hematoparasites Using Quantitative Buffy Coat Analysis Tubes Parasitology Today 5, #4:132-4 1989.

Levine, RA, Wardlaw, SC QBC malaria diagnosis. Lancet. 1992 May 30; 339(8805):1354.

Chesanow N, Levine RA Who wants to be a millionaire inventor? Med Econ. 2001 Apr 9;78(7):145-6, 149, 152.

Cobey. FC, Goldbarg SH, Levine RA, Patton CL: Short report: Detection of Borrelia (relapsing fever) in rural Ethiopia by means of the quantitative buffy coat technique. Am J Trop Med Hyg. 2001 Aug; 65(2):164-5.

Levine RA and others: Platform for Low Cost Quantitation of Rare Cells in Blood. Published as abstract by Battelle, Yale University School of Medicine and (2008) Viewable by link to www//mdinventons.com under "available for licensing" (Licensed to APi/RareCyte, Inc).

Levine, R.A. Dry hematology: its development, function, and role in point of care testing. Medical Laboratory Observer. 2013 February.

Jorgensen, M.B, Levine, R.A. et al. Potential Utility of a Novel Automated Point of Care Image Based Hematology Analyzer for the Diagnosis of Malaria as Part of a Routine CBC. AACC Houston, Texas, July 2013.

Wardlaw, S. C., Levine, R.A. et al. Measurement of RBC Indices in an Image-Based Whole Blood Analyzer. AACC Houston, Texas, July 2013.

Ports, B., Levine, R.A. et al. Disposable Analysis Chamber For A Novel Imaging-Based Hematology Instrument. AACC Houston, Texas, July 2013.

Other Publications:

Levine, R.A.: Digoxin (Lanoxin) Chapter Gradwohl's Clinical Laboratory Methods and Diagnosis, Volume One, 1980.

Wintrobe, Maxwell. M., Levine, R.A, Wardlaw S.: Buffy Coat Analysis, a Pictorial Review (Privately published by Becton Dickinson) 1983.

Hunt, Kevin J., Levine, R.A.: Book A Practical Guide to Allergy for the Primary-Care Physician. Access Primary Allergy Care System. Access Medical Systems, Inc., 1985

United States Issued Patents:

1 9,873,118 Biologic fluid analysis cartridge with sample handling portion and analysis chamber portion

2 9,733,233 Method and apparatus for analyzing individual cells or particulates using fluorescent quenching and/or bleaching

3 9,629,868 Method of treating and preventing neuro-olfactory triggered or

			aggravated illnesses or related conditions
4	9,395,365	T	Detection of infectious disease in a human or animal by measuring specific phagocytosis in a thin film sample of their anticoagulated blood
5	9,291,617	T	Method and apparatus for analyzing individual cells or particulates using fluorescent quenching and/or bleaching
6	9,274,094	T	Self-calibrating gradient dilution in a constitutent assay and gradient dilution apparatus performed in a thin film sample
7	9,046,473	T	Method and apparatus for detecting the presence of intraerythrocytic parasites
8	8,994,930	T	Method and apparatus for analyzing individual cells or particulates using fluorescent quenching and/or bleaching
9	8,885,154	T	Method and apparatus for identifying reticulocytes within a blood sample
10	8,842,264	T	Virtual separation of bound and free label in a ligand assay for performing immunoassays of biological fluids, including whole blood
11	8,781,203	T	Method and apparatus for determining at least one hemoglobin related parameter of a whole blood sample
12	8,778,687	T	Method and apparatus for determining the hematocrit of a blood sample utilizing the intrinsic pigmentation of hemoglobin contained within the red blood cells
13	8,774,487	T	Method and apparatus for remotely performing hematologic analysis utilizing a transmitted image of a centrifuged analysis tube
14	8,638,427	T	Method and apparatus for detecting and counting platelets individually and in aggregate clumps
15	8,569,076	T	Method for serologic agglutination and other immunoassays performed in a thin film fluid sample

16 8,502,963 T Method and apparatus for analyzing individual cells or particulates using fluorescent quenching and/or bleaching

17 8,481,282 T Method for detecting the presence of anisotropic crystals in undiluted whole blood

18 8,472,693 T Method for determining at least one hemoglobin related parameter of a whole blood sample

19 8,383,419 T Harvesting target materials from centrifuged suspensions

20 8,361,799 T Method and apparatus for determining the hematocrit of a blood sample utilizing the intrinsic pigmentation of hemoglobin contained within the red blood cells

21 8,319,954 T Virtual separation of bound and free label in a ligand assay for performing immunoassays of biological fluids, including whole blood

22 8,310,659 T Method and apparatus for detecting and counting platelets individually and in aggregate clumps

23 8,310,658 T Method and apparatus for identifying reticulocytes within a blood sample

24 8,284,384 T Method and apparatus for analyzing individual cells or particulates using fluorescent quenching and/or bleaching

25 8,269,954 T Method and apparatus for analyzing individual cells or particulates using fluorescent quenching and/or bleaching

26 8,221,985 T Self-calibrating gradient dilution in a constituent assay and gradient dilution apparatus performed in a thin film sample

27 8,133,738 T Method and apparatus for determining the hematocrit of a blood sample utilizing the intrinsic pigmentation of hemoglobin contained within the red blood cells

28 8,081,303 T Method and apparatus for analyzing individual cells or particulates using fluorescent quenching and/or bleaching

29 8,077,296 T Method and apparatus for detecting and counting platelets individually and in aggregate clumps

30 7,995,194 T Virtual separation of bound and free label in a ligand assay for performing immunoassays of biological fluids, including whole blood

31 7,951,599 T Method and apparatus for determining the hematocrit of a blood sample utilizing the intrinsic pigmentation of hemoglobin contained within the red blood cells

32 7,929,122 T Method and apparatus for determining red blood cell indices of a blood sample utilizing the intrinsic pigmentation of hemoglobin contained within the red blood cells

33 7,929,121 T Method and apparatus for detecting and counting platelets individually and in aggregate clumps

34 7,903,241 T Method and apparatus for determining red blood cell indices of a blood sample utilizing the intrinsic pigmentation of hemoglobin contained within the red blood cells

35 7,129,056 T Method for the detection, identification, enumeration and confirmation of virally infected cells and other epitopically defined cells in whole blood

36 6,911,315 T Method for the detection, identification, enumeration and confirmation of virally infected cells and other epitopically defined cells in whole blood

37 6,762,017 T Control for complete blood count analysis system

38 6,748,337 T Method and apparatus for providing quality control in an instrument for medical analysis

39 6,670,197 T Method for assaying whole blood for the presence or absence of circulating cancer or other target cell fragments

40 6,472,166 T Method for determining the effects of a growth-altering agent on a microbial colony

41 6,448,088 T Method and apparatus for detecting insoluable constituents in a quiescent urine sample

42 6,444,436 T Evacuated container assembly for analysis of a blood sample for the presence or absence of rare events

43 6,365,104 T Assembly for analyzing blood samples

44 6,350,613 T Determination of white blood cell differential and reticulocyte counts

45 6,197,523 T Method for the detection, identification, enumeration and confirmation of circulating cancer and/or hematologic progenitor cells in whole blood

46 6,007,990 T Detection and quantification of one or more nucleotide sequence target analytes in a sample using spatially localized target analyte replication

47 6,004,821 T Method and apparatus for performing chemical, qualitative, quantitative, and semi-quantitative analyses of a urine sample

48 5,834,217 T Assay of blood or other biologic samples for target analytes

49 5,830,639 T Method for analyzing blood samples

50 5,776,710 T Assay of blood or other biologic samples for target analytes

51 5,759,794 T Assay of blood or other biologic samples for target analytes

52 5,723,285 T Assembly for detecting blood-borne parasites and measuring blood sample parameters in a centrifuged sample of blood

53 5,707,876 T Method and apparatus for harvesting constituent layers from a centrifuged material mixture

54 5,705,739 T Detecting specific medical conditions from erythrocyte density distrubition in a centrifuged anticoagulated whole blood sample

55 5,635,362 T Assay of blood or other biologic samples for target analytes

56 5,593,848 T Target component assay utilizing specific gravity-altering liposomes

57 5,506,145 T Determination of an individual's inflammation index from whole blood fibrinogen and hematocrit or hemoglobin measurements

58 5,496,704 T Method for in vitro detection of formed elements in biological samples

59 5,480,778 T Determination of lymphocyte reactivity to specific antigens in blood

60 5,460,979 T Indirect fluorescent assay of blood samples

61 5,460,969 T Method for differentiating the source of occult gastrointestinal bleeding

62 5,403,714 T Method for in vitro detection of formed elements in biological samples

63 5,393,674 T Constitutent layer harvesting from a centrifuged sample in a tube

64 5,360,719 T Determination of lymphocyte reactivity to specific

65 5,342,790 T Apparatus for indirect fluorescent assay of blood samples

66 5,331,973 T Method for obtaining stool samples for gastrointestinal cancer testing

67 5,321,975 T Differential erythrocyte counts

68 5,252,460 T In vitro detection of ova, parasites, and other formed elements in stool

69 5,251,474 T Centrifuged material layer measurement in an evacuated tube

70 5,171,528 T Device for differentiating the source of occult gastro-intestinal bleeding

71 5,137,832 T Quantification of fibrinogen in whole blood samples contained in a tube using a float to separate materials

72 5,132,087 T Apparatus for measuring blood constituent counts

73 5,086,784 T Centrifuged material layer measurements taken in an evacuated tube

74 5,064,766 T Method for differentiating the source of occult gastrointestinal bleeding

75 5,023,785 T Hematology - diagnosis apparatus employing expert system technology

76 4,953,975 T Correction of material layer volume measurements

77 4,952,054 T Correction of blood count tube readings

78 4,940,668 T Method for increasing agglutination of groups of cells to produce improved cell layer interface in centrifuged blood sample

79 4,875,364 T Method for measuring hemoglobin

80 4,843,869 T Method for measuring hemoglobin

81 4,823,624 T Material layer volume determination with correction band

82 4,808,379 T Device for obtaining stool samples and detecting occult blood

83 4,804,518 T Device for occult blood testing

84 4,779,976 T Multiparameter hematology measurement for veterinarians

85 4,774,965 T Material layer volume determination with correction band

86 4,746,238 T Stick swab with augured head

87 4,700,715 T Device for detecting nocturnal penile erections

88 4,695,553 T Method for increasing agglutination of groups of cells to produce improved cell layer interface in centrifuged blood sample using antibodies

89 4,594,165 T Method of enhancing separation of abnormally light red cells from granulocytes in a centrifuged blood sample

90 4,567,754 T Measurement of small heavy constituent layer in stratified mixture

91 4,559,949 T Stool sampling device

92 4,420,353 T Method of making a stool sampling device

93 4,367,750 T Device for obtaining stool samples

94 4,273,741 T Device for obtaining stool samples

95 4,259,964 T Device for obtaining stool samples

96 4,209,226 T Optical viewing instrument including capillary tube and holder

97 4,204,015 T Insulating window structure and method of forming the same

98 D254,444 T Blood sampling needle

99 4,190,328 T Process for detection of blood-borne parasites

100 4,181,609 T Blood constituents testing method

101 4,170,995 T Catheter clamp

102 4,159,896 T Enhancement of separation of cell layers in centrifuged blood sample

103 4,141,654 T Standard for calibrating and/or verifying instrument accuracy

104 4,137,755 T Material layer volume determination

105 4,091,659 T Apparatus for measuring white cell count

106 4,082,085 T Blood constituent testing methods

107 4,077,396 T Material layer volume determination

108 4,027,660 T Material layer volume determination