

Curriculum Vitae



Ellen M. Areman
eareman@bcg-usa.com
Senior Consultant
Biologics Consulting Group, Inc.
Glen Burnie, MD
P (410) 207-0531

EXPERIENCE

Biologics Consulting Group, Inc., Senior Consultant
Glen Burnie, MD (Dec. 2005 to present)

Office of Cellular, Tissue and Gene Therapies, Center for Biologics Evaluation, U.S. Food and Drug Administration, Expert Biologist/Product Reviewer (July 2005 to Nov. 2005)
Rockville, MD.

Office of Cellular, Tissue and Gene Therapies, Center for Biologics Evaluation, U.S. Food and Drug Administration, Biologist/Product Reviewer, Cell Therapy Branch
(Oct. 2002 – July 2005) Rockville, MD.

Office of Therapeutics Research and Review, Center for Biologics Evaluation and Research, U.S. Food and Drug Administration, Biologist/Product Reviewer, Div. of Cell and Gene Therapy (Dec. 2001 – Oct. 2002), Rockville, MD

- FDA expert on the characterization, manufacture, and control of novel biological products in the area of hematopoietic stem cells, umbilical cord/placental blood, cancer immunotherapy, and other cell-based therapies.
- Primary reviewer of over 50 active cell therapy IND, IDE, DMF files in such areas as treatments for cardiac disease, therapy for autoimmune diseases, hematopoietic stem cell transplantation, cord blood banking, and cancer immunotherapy.
- Provided consultation services to other centers for review of submissions of combination products containing cellular elements.
- Served as agency spokesperson to regulated industry and academia on issues related to hematopoietic progenitor cell products.
- Participated in planning and presentation of Advisory Committee meetings.
- Co-chaired the Cord Blood Standards subgroup of CBER Hematopoietic Stem Cell Task Group whose purpose is to develop regulatory policy for cord blood stem cells.
- Co-chaired FDA-CBER/NIH-NHLBI Cell Therapy Working Group for interagency discussions of regulatory and other issues regarding cell-based therapies for heart, lung and blood diseases.



- FDA Liaison to DHHS Interagency Working Group for Cellular Therapies
- Member of CBER Rapid Microbiological Methods Working Group charged with developing policy and guidance for implementation of new methods for assessing sterility of biologic products
- Branch representative to CBER/CDRH Cardiovascular Product Cross-Center Team whose mission is to identify and prioritize key issues for the cardiovascular cellular product area.
- Member of FDA Xenotransplantation IND Reviewer Focus Group, FDA Tumor Vaccine Working Group and OCTGT Comparability Working Group.
- FDA liaison to AABB Cellular Therapies Standards Program Unit and Cellular Therapy Certificate Program Development Subcommittee for development of standards for somatic cell therapy and cord blood products.
- Interacted with sponsors early in product development to facilitate the progression of clinical trials by identifying problematic areas in product safety, characterization and manufacturing.
- Interacted with industry, other federal and international agencies, and with other FDA reviewers to provide time-critical guidance on scientific and regulatory issues involving novel cellular therapies
- Developed and facilitated implementation of a tiered, risk-based approach to endotoxin release testing requirements for cellular products. Currently working on this approach for other cell therapy release testing.

Department of Transfusion Medicine (DTM), National Institutes of Health, *Clinical Services Coordinator- Cell Processing Section*, Nov. 1999 – Dec. 2001
Bethesda, MD

- Chief liaison between the Cell Processing Section and patient care personnel for coordination and management of cell processing services for stem cell transplantation
 - Developed and implemented processes and procedures for meeting the diverse requirements of more than 30 active investigational protocols, including donor/patient testing, cell collection, cell processing and cell administration.
 - Chair of the Inter-institute Cell Transplant Coordination Committee formed to facilitate communication, education and resource sharing among the various NIH transplantation and cellular therapy programs. Designed and implemented education and training materials and programs for Department and Institute patient care staff.
 - Consultant to investigators and patient care staff on Cell Processing Section policies and procedures, professional standards, and regulatory requirements
 - Primary liaison for data management between Cell Processing Section and Institutes.
 - Designed, tested and implemented organizational tools that supported and maximized efficient and appropriate use of departmental resources for clinical trials.
 - Participated in development, review and implementation of clinical research protocols and in planning of laboratory services to support those protocols.
- Project manager for selected research and development projects performed in collaboration with Institute investigators and/or biotechnology companies. Some examples are:
 - Umbilical cord blood banking for siblings of sickle cell patients
 - Evaluation of new automated cell selection systems
 - Culture, expansion and manipulation of hematopoietic and other human cells
 - Evaluation of novel assays for quality assessment of cellular therapy products



- Actively participated in design of investigational studies.
- Designed and supervised laboratory experiments and validation studies to support clinical trials.

Pediatric Cancer and Stem Cell Research Program & Children's Cancer Group (CCG) Central Hematopoiesis Laboratory, Georgetown University Medical Center, *Laboratory Manager*, (March 1999 – Nov. 1999) Washington, DC

- Directed overall operation of the Pediatric Cancer and Stem Cell Research Program and CCG Central Hematopoiesis Laboratory (housed at Georgetown University).
 - Participated in grant preparation and research and translational protocol development. Reviewed proposed protocols for accuracy and feasibility.
 - Developed personnel, supply and equipment budgets for research protocols.
 - Developed and implemented databases and spreadsheets for tracking and evaluating research data.
 - Provided technical and regulatory guidance to laboratory investigators.
 - Supervised flow cytometry and progenitor cell analysis, analyzed data and prepared laboratory and administrative reports for the CCG Central Hematopoiesis Laboratory.

Georgetown University/NHLBI (COBLT) Cord Blood Bank, Georgetown University Medical Center, *Laboratory Manager*, (April 1998 – Nov. 1999) Washington, DC

- Technical expert on steering committee responsible for designing, developing and implementing the NHLBI-funded Georgetown University Medical Center Cord Blood Bank.
- Responsible for development of laboratory budget, design of laboratory space, selection of equipment, hiring and training cord blood bank laboratory staff and writing the laboratory standard operating procedures.
- Responsible for oversight of preparation, testing, cryopreservation, storage and shipping of cord blood units.
- Developed and implemented quality assurance program, including computer database that facilitated monitoring of collection and processing of cord blood units, proficiency and competency evaluation of laboratory staff and validation of laboratory processes.
- Responsible for supply purchases and budget management.
- Responsible for personnel management, including interviewing, hiring, scheduling, coaching, counseling, evaluating and terminating employees.
- Responsible for final review of cord blood records and release of units from quarantine.
- Coordinated proficiency workshops for laboratories performing COBLT flow cytometry testing.

Cellular Engineering/Molecular and Cellular Hematotherapy Laboratory, Georgetown University Medical Center, *Supervisor/Technical Specialist*, Jan. 1987 – March 1997; *Technical Director*, March 1997 – March 1999 Washington, DC

- Developed a laboratory support system providing cell processing services for autologous and allogeneic patients receiving bone marrow, peripheral blood stem cell and cord blood transplants.
- Provided oversight and coordination all Cell Processing activities including processing,



- culture, expansion, cryopreservation, testing and graft evaluation of bone marrow, peripheral blood stem cells and cord blood for large inpatient and outpatient transplant program.
- Coordinated bone marrow harvests and shipments with the donor coordinators of the National Marrow Donor Program. Georgetown University Medical Center was the largest bone marrow collection center for the NMDP.
 - Collaborated with internal and external investigators on laboratory and clinical research protocols, including submission of Investigational New Drug applications to the FDA.
 - Designed and implemented databases for management of clinical and research data.
 - Developed, validated and implemented new laboratory techniques for ex vivo cellular therapy and for graft evaluation.
 - Responsible for writing Standard Operating Procedures for the and Molecular and Cellular Hematotherapy (formerly Cellular Engineering) Laboratory and the Georgetown University Hospital Apheresis Center.
 - Designed and managed research and development projects involving cell therapy and graft engineering.
 - Collaborated with clinical and laboratory scientists as well as biotechnology companies to develop new techniques for cellular processing, hematotherapy and immunotherapy
 - Provided translational laboratory support and assisted researchers in scaling up bench top experiments
 - Developed and supervised program for external investigators and technologists to receive hands-on training in basic cell processing techniques
 - Designed and implemented numerous innovative processes now in common use, including:
 - Automated procedure for concentration and purification of bone marrow mononuclear cells
 - Procedure for large-scale ex vivo activation of frozen/thawed bone marrow and peripheral blood stem cells with interleukin-2
 - System for predicting hematopoietic progenitor cell content of peripheral blood stem cell collections based on circulating peripheral blood CD34+ cells.
 - Real-time flow cytometric analysis of PBSC collections to optimize progenitor cell yield and minimize number and length of collections
 - Use of synthetic plasma substitutes to replace tissue culture media for bone marrow collection
 - Responsible for directed donor cord blood banking program.
 - Successfully prepared the Laboratory for inspections by the AABB, College of American Pathologists, FDA and FAHCT (now FACT).
 - Supervised the quality assurance and preventive maintenance programs.

EDUCATION

M.S., Pathology, Georgetown University; Washington, D.C. (1993)

Specialist in Blood Banking, National Institutes of Health; Bethesda, Maryland (1986)

B.S., University of the State of New York; Albany, N.Y. (1984)

HONORS AND AWARDS

2005	CBER Policy Development Award. For identifying and acting on an emerging policy issue to facilitate review and regulation of a novel combination
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2005	FDA Individual Reward and Recognition Award. For contribution to the public health mission by presenting a regulatory presentation at the International Society for Cell Therapy Annual Meeting.
2004	CBER Reward & Recognition Award. For participation as co-chairman of the working group responsible for organizing the March 18-19, 2004, BRMAC meeting to discuss Cellular Products for the Treatment of Cardiac Disease.
2004	FDA Individual Reward and Recognition Award. For presenting a regulatory presentation and participating on an expert panel on the topic of regulation of Umbilical Cord Blood at the International Society for Cell Therapy annual Somatic Cell Therapy Symposium.
2003	CBER Reward & Recognition Award For outreach efforts in preparing a presentation on CBER's Rapid Lot Release Testing for Cell Therapy Products at RAPS conference in Baltimore, MD.
2003	CBER Reward & Recognition Award. For developing a checklist to be used by all reviewers of cell therapy INDs when reviewing responses to the Somatic Cell Therapy letter.
2003	CBER Reward & Recognition Award. For participation in the Hematopoietic Stem Cell Standards Working Group and providing key input in planning the February 27, 2003 BRMAC meeting on cord blood.
2003	FDA Individual Reward and Recognition Award. For outreach efforts in preparing a presentation on CBER's Perspective on Rapid Microbiology Systems for Cell therapy Products in April 2003.
2000	NIH Clinical Center Special Service Award
1987	NIH Clinical Center Special Service Award
1987	AABB Scholarship Award

PROFESSIONAL SOCIETIES

American Association of Blood Banks
 American Society of Clinical Pathologists
 International Society for Cell Therapy

PUBLIC SERVICE

- Editorial Board – Cytotherapy
- Reviewer: Transfusion, Bone Marrow Transplantation
- Abstract Reviewer: AABB Annual Meeting (2003-2005)
- Independent Reviewer: Institute of Medicine Study Report: “From Discord to Accord: Establishing a National Cord Blood Stem Cell Bank Program” (2005)
- Board of Directors: International Society for Hematotherapy and Graft Engineering (ISHAGE) (1992-1995)
- NIH NHLBI Special Emphasis Panel: Therapy Groups to Study T Cell Depletion in Unrelated Donor Marrow Transplantation (1993)



ADDITIONAL TRAINING

- Inspection Training for Product Specialists (10/04)
- CDER Pre-Market Review for CDRH and CBER Reviewers (10/04)
- CDRH Standards Liaison Training (8/04)
- CBER/CDRH Reviewer Best Practices (6/04)
- FDA-DIA Workshop (5/04)
- Ethical and Regulatory Aspects of Human Subjects Research (12/03)
- Security Awareness (11/03)
- CBER/CDER Joint PDUFA III Training (10/03)
- Endotoxin - Biology, Testing and Device Issues (9/03)
- FDA Ethics Training (9/03)
- CBER Medical Device Training (7/03)
- Economic Espionage Awareness (6/03)
- Introduction to Nanotechnology (5/03)
- Basic Food and Drug Law Course (5/03)
- Combination Products Training Course (4/03)
- MDUFMA Performance Goals (12/02)
- CBER Case Study Seminar Series: Specifications, Stability and Statistics (11/02)
- Reviewer Training Program (4/02)
- Common Technical Document Overview Training (1/02)
- CBER Education Forum: Assay Validation Case Study (11/01)

BIBLIOGRAPHY

SELECTED PRESENTATIONS

5/05	ISCT Annual Meeting - “Release Testing of Cellular Therapy Products”
10/04	ISCT Somatic Cell Therapy Symposium – “Quality Assessment of Umbilical Cord Blood (UCB) Products”
10/03	FDA CBER Grand Rounds – “Cellular Therapies for Cardiac Disease”
10/03	RAPS 2003 Conference – “Release Testing for Cell Therapy Products”
4/03	Rapid Microbiology Users Group Conference – “CBER Perspective on Rapid Microbiology Systems for Cell Therapy Products”
12/02	NIH FAES Immunohematology Course – “Production, Processing and Preparation of Cells for Therapy”
10/01	American Association of Blood Banks Annual Meeting – Workshop Director – “Technical Issues in Cell Manipulation”
6/00	ISHAGE Annual Meeting – “Breakfast with the Experts: Setting up a Stem Cell Laboratory”
1/99	American Association of Blood Banks Audioconference – “Cryopreservation, Storage and Shipping of Hematopoietic Progenitor Cells”
10/98	College of American Pathologists Annual Meeting – Washington, DC – “Processing and Storage of Peripheral Blood Stem Cells”
5/98	Karen Tiegerman Memorial Lecture – Massachusetts Association of Blood Banks – Woburn, MA – “New Challenges in Stem Cell Processing”

5/97	Peripheral Blood Stem Cell Workshop - Tempe, AZ – “Autologous Peripheral Blood Stem Cell Processing, CD34 Selection and Tumor Purging”
3/97	American Society for Apheresis (ASFA) Annual Meeting – Washington, DC – “Cryopreservation, Storage and Shipment of Mononuclear Cell Products

BOOKS

Areman EM, Sacher RA, Deeg HJ (eds). Bone Marrow and Stem Cell processing: a Manual of Current Techniques. F.A. Davis, Philadelphia PA, 1992

JOURNAL ARTICLES

1. Meehan KR, Slack R, Gehan E, Herscowitz HB, Areman EM et al. Mobilization of peripheral blood stem cells with paclitaxel and rhG-CSF in high-risk breast cancer patients. *J Hematother Stem Cell Res.* 11(2):415-21, 2002.
2. Kang EM, Areman EM, David-Ocampo V, et al. Mobilization, collection, and processing of peripheral blood stem cells in individuals with sickle cell trait. *Blood* 99(3):850-5, 2002.
3. Goldman SC, Bracho F, Davenport V, Slack R, Areman E, et al. Feasibility study of IL-11 and granulocyte colony-stimulating factor after myelosuppressive chemotherapy to mobilize peripheral blood stem cells from heavily pretreated patients. *J Pediatr Hematol Oncol.* 23(5):300-5, 2001.
4. Meehan KR, Areman EM, Ericson S et al. Mobilization, collection and processing of autologous peripheral blood stem cells: development of a clinical process with associated costs. *J Hematother Stem Cell Res,* 10:767-71, 2000.
5. Areman EM, Rhodes PL, Mazumder A, Verma UN, Meehan KR. Differential effects of interleukin-2 incubation on hematopoietic potential of autologous bone marrow and mobilized peripheral blood stem cells from patients with hematological malignancies. *J Hematotherapy,* 8:39-44, 1999.
6. Meehan KR, Arun B...Areman EA, et al. Immunotherapy with Interleukin-2 and alpha-interferon following Il-2 activated hematopoietic stem cell transplantation for breast cancer. *Bone Marrow Transplant,* 23:667-73, 1999.
7. Areman EM, Meehan KR, Sacher RA. Pre-apheresis levels of peripheral blood (PB) CD34+cells correlate with CD34+ peripheral blood stem cells (PBSC) in autologous patients. *Transfusion,* 37:1217, 1997 (Letter).
8. Areman E. ISHAGE: the next step. *J Hematotherapy,* 6:437-438, 1997.
9. Meehan KR, Badros A, Frankel S, Cahill R, Areman E, Jenson M, Sacher R, Mazumder A: A pilot study evaluating interleukin-2-activated hematopoietic stem cell transplantation for hematologic malignancies. *J Hematotherapy* 6:457-462, 1997.
10. Meehan KR, Verma UN, Cahill R, Frankel S, Areman EM, Sacher RA, Foelber R, Rajagopal C, Gehan EA, Lippman ME, Mazumder A: Interleukin-2-activated hematopoietic stem cell transplantation for breast cancer: investigation of dose level with clinical correlates. *Bone Marrow Transplantation,* 20:643-651, 1997.
11. Areman EM, Mazumder A, Kotula PL, et al. Hematopoietic potential of IL2-cultured peripheral blood stem cells from breast cancer patients. *Bone Marrow Transplantation,* 18:521-525, 1996.

12. Verma UN, Areman EM, Dickerson SA, et al. Interleukin-2 activation of chemotherapy and growth factor-mobilized peripheral blood stem cells for generation of cytotoxic effectors. *Bone Marrow Transplantation*, 15:199-206, 1995.
13. Verma UN, Areman EM, Sacher RA, Mazumder A. In vitro activation of peripheral blood stem cells with interleukin-2. *Prog Clin Biol Res*, 389:245-55, 1994.
14. Spitzer TR, Areman EM, Cirenza E, Yu M, Dickerson SA, Kotula PL, Sacher RA, Cottler-Fox M. The impact of harvest center on quality of marrows collected from unrelated donors. *Journal of Hematotherapy*, 3:65-70, 1994.
15. Areman EM, Dickerson SA, Kotula PL, Spitzer TR, Sacher RA. Use of a licensed electrolyte solution as an alternative to tissue culture medium for bone marrow collection. *Transfusion*, 33:562-566, 1993.
16. Charak BS, Areman EM, Dickerson SA, et al. A novel approach to immunomodulation of frozen human bone marrow with interleukin-2 for clinical application. *Bone Marrow Transplantation*, 11:147-154, 1993
17. Areman EM & Cottler-Fox M. Processing and storage of human bone marrow: do we know enough to set guidelines, standards and regulations? *Journal of Hematotherapy*, 1:103-114, 1992.
18. Areman EM, Cullis H, Bazar L, Spitzer T, Sacher RA. Automated treatment of human bone marrow can result in a population of mononuclear cells capable of achieving engraftment following transplantation. *Transfusion*, 31:724-730, 1991.
19. Areman EM and Sacher RA. Bone marrow processing for transplantation. *Transfusion Medicine Reviews*, 5:214-227, 1991.
20. Areman EM, Sacher RA, Deeg HJ. Processing and storage of human bone marrow: a survey of current practices in North America. *Bone Marrow Transplantation*, 6:203-209, 1990.
21. Areman EM, Sacher RA, Deeg HJ. Bone marrow storage and processing: is it time to set standards? *Transfusion*, 30:574, 1990. (Letter)
22. Areman EM, Simonis T, Carter C, Read EJ, Klein HG. Bulk cryopreservation of lymphocytes in glycerol. *Transfusion*, 28:151-156, 1988.

BOOK CHAPTERS

1. Areman EM, Benton K, McFarland R. Regulatory considerations in manufacturing, product testing and preclinical development of cellular products for cardiac repair. In: *Stem Cell Therapy and Tissue Engineering for Cardiovascular Repair: From Basic Research to Clinical Applications*. Dib N, Taylor DA, Diethrich EB (eds). Springer, New York, NY. In press (tentative release date: Sept. 2005).
2. Areman EM. Storage and preservation of products for cellular therapy. In: *Current Perspectives in Cellular Therapy 2002*. Szczepiorkowski ZM, Snyder EL (eds). American Association of Blood Banks, Bethesda, MD, pp13-15, 2001.
3. Areman EM. Processing of products for cellular therapy. In: *Current Perspectives in Cellular Therapy 2002*. Szczepiorkowski ZM, Snyder EL (eds). American Association of Blood Banks, Bethesda, MD, pp10-12, 2001.
4. Kotula PL, Areman EM, Sacher RA. Hematopoietic stem cell processing and transplantation. In: *Red Cell Transfusion, a Practical Guide*. Reid MW and Nance SJ. Humana Press Inc., Totowa, NJ, pp121-137, 1998.

5. Areman EM, Rajagopal C, Mazumder A. Purging of bone marrow and peripheral blood stem cells. In: *On Call in Bone Marrow Transplantation*. Burt RK, Deeg HJ, Lothian GW and Santos G (eds). R. G. Landes Co., Austin TX, 1996.
6. Areman EM, Sacher RA. The processing and preservation of hematopoietic progenitor cells. In: *Principles of Transfusion Medicine-2*. Rossi EC, Simon TL, Moss GS and Gould SA (eds). Williams & Wilkins: Baltimore MD, pp 465-473, 1996.
7. Areman EM, Dickerson SA, Bender JG, Cullis H, Sacher RA. Use of licensed electrolyte solutions and anticoagulant citrate dextrose for bone marrow collection. In: *Progress in Clinical & Biological Research: Advances in Bone Marrow Processing and Purging*. Gross SR, Gee AP & Worthington-White DA (eds). Wiley-Liss: New York, NY, pp 353-359, 1992.
8. Areman EM. Mononuclear cell concentration and processing techniques. In: *Bone Marrow Transplantation: Practical and Technical Aspects of Stem Cell Reconstitution*. Sacher RA & Aubuchon J (eds). American Association of Blood Banks: Bethesda MD, 1992.
9. Cullis HM, Areman EM, Carter CS. Nucleated cell separation using the CS3000. In: *Bone Marrow Processing and Purging: a Practical Guide*. Gee A (ed). CRC Press: Boca Raton FL, pp 53-71, 1991.
10. Areman EM, Sacher RA, Deeg HJ. Cryopreservation and storage of human bone marrow: a survey of current practices. In: *Bone Marrow Purging and Processing. Proceedings of the Second International Symposium on Bone Marrow Purging and Processing*. Gross SR, Gee A (eds). Alan R. Liss: New York, 523-529, 1990.
11. Areman EM, Cullis H, Sacher RA, Cottler-Fox M, Deeg HJ. Automated isolation of mononuclear cells using the Fenwal CS3000 Blood Cell Separator. In: *Bone Marrow Purging and Processing. Proceedings of the Second International Symposium on Bone Marrow Purging and Processing*. Gross SR, Gee A (eds). Alan R. Liss: New York, 379-385, 1990.
12. Areman EM. Bone marrow transplantation: nuances of transfusion support implications for the blood bank. In: *Processing of Bone Marrow for Transplantation*. Sacher RA, McCarthy LJ, Smit Sibinga CT (eds). American Association of Blood Banks: Arlington VA, 63-81, 1990.

ABSTRACTS, POSTERS AND ORAL PRESENTATIONS

1. Areman EM, David-Ocampo V, Carter CS, et al. Viable cell populations can be recovered from cryopreserved apheresis products for at least 2 hours after thawing. Poster. ISHAGE 2001 Annual Meeting, Quebec, Canada, June, 2001.
2. Areman EM, David-Ocampo V, Kang EM, et al. Ammonium chloride lysis for red blood cell (RBC) depletion of peripheral blood stem cell (PBSC) products. *Blood* 96:325b, 2000.
3. Kang EM, Areman E, Read EJ, Leitman S, Link B, David-Ocampo V, Rodgers GP, Tisdale J. [46] Mobilization and apheresis of sickle cell trait (sct) donors is safe and feasible. Poster. *Blood* 96: 14a, 2000.
4. Areman EM, David-Ocampo V, Carter C, Read EJ. Post-thaw losses of progenitor and T cells from peripheral blood stem cells (PBSC) cryopreserved in a pentastarch solution do not increase for up to 2 hours after thawing. Oral presentation. *Blood* 96:520a, 2000.
5. Bachman BJ, David-Ocampo V, Guevarra C, Areman EM. Refreezing peripheral progenitor cells (PBPC): a pilot study. Oral presentation. *Transfusion* 40 (Suppl):44S, 2000.

6. Meehan K, Matias C, Areman E, et al. Paclitaxel with rhG-CSF is an effective regimen for stem cell mobilization in breast cancer patients. Amer Soc Clin Onc abstract #174, 1999.
7. Meehan KR, Matias CO, Schulman K, Areman E, Seifeldin R. Costs associated with cytokine mobilization of PBSC. Blood 92 (Suppl 1):4305, 1999.
8. Areman EM, Rhodes PL, Meehan KR, et al. Analysis of 461 unrelated NMDP donors over the last 3 years from a single collection center: significant differences between male and female donors. Exp Hematology 25:781, 1998.
9. Meehan KR, Miao Y, Wu AG, Areman EM, Herscowitz HB. Isolation of cytotoxic effector cells from IL-2-activated hematopoietic stem cell populations. J Hematotherapy 7:277 (P-44), 1998.
10. Areman EM, Rhodes PL, Meehan KR, Badros A, Sacher RA, Spitzer G. Real-time analysis of CD34-positive progenitor cells for optimization of peripheral blood stem cell (PBSC) collection. J Hematotherapy 7:280 (P-55), 1998.
11. Meehan KR, Ebadi-Tehrani, Areman EM, et al. Priming with high dose paclitaxel and rhG-CSF for breast cancer patients. Blood 90 (Suppl 1):331b, 1997.
12. Areman EM, Rhodes PL, Meehan KR, Sacher RA. Costs of autologous peripheral blood stem cell (PBSC) transplantation can be reduced by PB CD34 screening before apheresis. Blood 90 (Suppl 1):322b, 1997.
13. Areman EM, Garcia A, Sandler SG, Sacher RA. Comparative evaluation of two cell separators for collection of peripheral blood stem cells. J Hematotherapy 6:4, 405, 1997.
14. Rhodes PL, Areman EM, Sacher. Increased cell recovery in bone marrow processing using the CS3000 Plus. J Hematotherapy 6:4, 417, 1997.
15. Matronics B, Areman EM, Rhodes PL, Sacher RA. Validation of blood culture bottles for sterility testing of peripheral blood stem cells. J Hematotherapy 6:4, 400, 1997.
16. Areman EM, Meehan KR, Sacher RA. Peripheral blood (PB) CD34 as a predictor of hematopoietic progenitor cells (HPC) in peripheral blood stem cell (PBSC) collections. Blood 90 (Suppl 1):214a, 1997.
17. Areman EM, Kotula-Rhodes P, Rajagopal C, et al. Effect of 24-hour culture with interleukin 2 (IL2) on progenitor cells in autologous bone marrow (ABM) and peripheral blood stem cells (PBSC) from patients with hematological malignancies. Blood 88:437-I, 1996.
18. Cahill RA, Herbst J, Meehan KR, Rajagopal C, Areman E, Mazumder A, Hartzman R. Bone marrow volume and the use of autologous blood transfusions (ABT) in unrelated donors. Blood 88:3841a, 1996.
19. Areman EM, Meehan KM, Kotula PL, Rajagopal C, Hancock S, Guevarra C, Djahanmir M, Verma U, Mazumder A, Sacher RA. Hematopoietic potential of interleukin 2 (IL2) cultured peripheral blood stem cells (PBSC) from breast cancer patients. Blood 86:234a, 1995.
20. Meehan KR, Rajagopal C, Verma UN, Frankel SR, Cahill R, Areman EA, Foelber R, Lippman, ME. Biologic and clinical correlates of interleukin-2 (IL-2) administration in peripheral blood stem cell (PBSC) transplantation for breast cancer. Blood 86:389a, 1995.
21. Rajagopal C, Areman EM, Verma U, Meehan K, Cahill R, Frankel SR, Kotula P, Hancock S, Sacher R, Mazumder A. Paclitaxel as a single agent is superior to cyclophosphamide for mobilizing CD34+ cells for stem cell transplantation. Blood 86:390a, 1995.

22. Badros A, Areman E, Rajagopal C, Cahill R, Frankel SR, Mazumder A, Meehan KR. G-CSF mobilized peripheral blood progenitor cells for allogeneic transplantation: kinetics and composition of the graft. *Blood* 86:979a, 1995.
23. Rajagopal C, Verma U, Meehan KR, Areman E, Bagg A, Cahill R, Mazumder A. IL-2 activated peripheral blood stem cells transplantation in breast cancer patients: Patients with metastatic disease generate less cytotoxic effectors. *Proc Amer Soc Clin Onc.* 14:104a, 1995
24. Downs MP, Areman E, Johnson AH, Sacher RA. The use of peripheral blood stem cells for serological typing. *Proc Amer Soc for Histocompatibility and Immunogenetics.* 7.1,182, 1995.
25. Kotula P, Areman E, Hancock S, Sacher R. An alternative to bedside thawing of peripheral blood stem cells. *J Hematotherapy* 4:3, 101, 1995.
26. Areman E, Kotula P, Sacher R, Dinan D, Pope I. A computer program for cell processing data and inventory management. *J Hematotherapy* 4:3, 112, 1995.
27. Rajagopal C, Verma U, Meehan K, Areman E, Bagg A, Cahill R, Mazumder A. Activated peripheral blood stem cell transplantation in breast cancer patients: patients with metastatic disease generate less potent cytotoxic effectors. *Proc Amer Soc Clin Onc.* 14:104a, 1995.
28. Areman EM, Dickerson SA, Kotula PL et al. Comparison of peripheral blood progenitor cell (PBPC) yield following 2 and 3 blood volume leukapheresis. American Association of Blood Banks annual meeting, November 1994. S17
29. Areman EM, Dickerson SA, Kotula PL and Sacher RA. A micro technique for progenitor cell assays. American Association of Blood Banks annual meeting, November 1994. S228
30. Rajagopal C, Verma U, Areman E, Cahill R, Mazumder A. Induction of autologous graft vs. host disease (GVHD) with IL-2 activated peripheral stem cell transplantation. *Blood* 84;10 (Suppl 1) Abstract #1318, November 1994
31. Cahill R, Verma U, Areman E, Rajagopal C, Hodgson, Mazumder A. IL-2 activated bone marrow transplantation in patients with advanced hematological malignancies. *Blood* 84; 10 (Suppl 1) November 1994.
32. Mazumder A, Verma U, Areman E, Rajagopal C, Cahill R, Swain S. Peripheral blood stem cell (PBSC) transplantation with interleukin-2 (IL-2) activated PBSC leads to visceral graft vs. host disease (GVHD). ASCO Annual Meeting, Dallas, TX, May, 1994
33. Verma U, Areman EM, Sacher RA, Mazumder A. In vitro activation of peripheral blood progenitor cells with interleukin-2. Fourth International Symposium on Bone Marrow Purging and Processing. Orlando, FL, September 16, 1993.
34. Areman EM, Dickerson SA, Bender J, Sacher RA. Bone marrow collection using synthetic plasma substitutes and acid citrate dextrose. Third International Symposium on Bone Marrow Purging and Processing. San Diego, CA, October 1991.
35. Areman EM, Spitzer T, Sacher RA. Blood product usage in bone marrow transplant patients receiving continuous infusion intravenous immune globulin (IVIg). American Society for Hematology Annual Meeting. 1991.
36. Areman EM, Cullis H, Bazar L, Spitzer T, Sacher RA. Automated isolation of bone marrow mononuclear cells with the Fenwal CS3000 blood cell separator. *Experimental Hematology* 1990; 18:678.

37. Areman EM, Cullis H, Bazar L, Spitzer T, Sacher RA. Automated purification of mononuclear cells from bone marrow with the Fenwal CS3000 results in recovery of progenitor cells and engraftment following transplantation. Book of abstracts 1990; American Association of Blood Banks S713.
38. Areman EM, Simonis T, Carter C, Read EJ, Klein HG. Bulk cryopreservation of lymphocytes in glycerol. Poster presentation. 1987 Annual Meeting. Mid Atlantic Association of Blood Banks.
39. Areman EM, Simonis T, Carter C, Read EJ, Klein HG. Bulk cryopreservation of lymphocytes in glycerol. Poster presentation. 1987 Annual Meeting. American Association of Blood Banks.