VRI and University of California, San Francisco **Prepared 2019/03/21**

Curriculum Vitae

Name: **Rachael Peretz Jackman**

Position: Assistant Investigator
Vitalant Research Institute (formerly Blood Systems Research Institute)

Address: 270 Masonic Avenue
San Francisco CA 94118, USA

Voice: (415) 923-5762 Ext. 714
Fax: (415) 775-3895
Email: rjackman@vitalant.org
Web: https://research.vitalant.org/Investigators/Rachael-Jackman

EDUCATION

1995-1999	University of California, Berkeley Emphasis in Immunology Thesis Advisor: Leslie Louie Honors Thesis: *HLA Class I Association with Coccidioidomycosis Disease Severity in California*	B.A.	Molecular and Cell Biology,
2001-2004	Yale University	M.S.	Immunobiology
2001-2004	Yale University	M.Phil	Immunobiology
2001-2007	Yale University Dissertation Advisor: Kim Bottomly Dissertation: *CTLA-4 and the Immunological Synapse in T_H1 and T_H2 cells*	Ph.D.	Immunobiology

LICENSES, CERTIFICATION

Not applicable

PRINCIPAL POSITIONS HELD

1997-1998	University of California, Berkeley	Laboratory Assistant
1998-2001	University of California, Berkeley	Research Assistant
2007-2007	Yale University	Post Doctoral Associate
2008-2012	Blood Systems Research Institute	Post Doctoral Research Fellow
2012-2016	Blood Systems Research Institute	Staff Scientist I
2016-now	Vitalant Research Institute (formerly BSRI)	Assistant Investigator
2018-now	UCSF Department of Laboratory Medicine	Adjunct Assistant Professor

OTHER POSITIONS HELD CONCURRENTLY

2008-2010	UCSF Department of Laboratory Medicine	Postdoctoral Scholar

HONORS AND AWARDS

1995	University of California, Berkeley F. Ahellas Honorary Scholarship
1995-1997	University of California, Berkeley Alumni Scholarship
1995-1999	Dean's Honors List at the University of California, Berkeley
1999	Outstanding Molecular and Cellular Biology Researcher Award at the University of California at Berkeley

1999 Graduation with Honors and Distinction from the Department of Molecular and Cell Biology at the University of California at Berkeley
2011 ASH Abstract Achievement Award

KEYWORDS/AREAS OF INTEREST
Immunology, Alloimmunization, Blood Transfusion, Tolerance, Pathogen Reduction, Traumatic Injury

PROFESSIONAL ACTIVITIES

CLINICAL
Not applicable

PROFESSIONAL ORGANIZATIONS
MEMBERSHIPS
2006-now American Association of Immunologists
2007-2009 New York Academy of Sciences
2009- now American Association of Blood Banks
2011- now American Society of Hematology

SERVICE TO PROFESSIONAL PUBLICATIONS
2011- now Ad hoc referee for Transfusion (5)
2017- now Ad hoc referee for Blood (5)
2018-now Ad hoc referee for Blood Advances (1)
2018-now Ad hoc referee for Haematologica (1)
2018-now Ad hoc referee for Vox Sanguinis (1)

INVITED PRESENTATIONS
INTERNATIONAL
2018 Cerus 13th International Seminar on Blood Safety, Paris, France (invited talk)

NATIONAL
1999 Annual Meeting of the American Society for Histocompatibility and Immunogenetics, New Orleans, LA, abstract # 79 (poster)
1999 Annual Meeting of the Society for Epidemiologic Research, Baltimore, MD, abstract # 306 (poster)
2000 Annual Meeting of the Coccidioidomycosis Study Group, Berkeley, CA, abstract # 13 (oral abstract)
2006 Annual Meeting of the American Association of Immunologists (AAI), Boston, MA, abstract # 264 (poster)
2009 American Association of Blood Banks (AABB) Annual Meeting, New Orleans, LA, abstract # SP266 (poster)
2009 American Association of Blood Banks (AABB) Annual Meeting, New Orleans, LA, abstract # S93-040A (oral abstract)
2010 American Association of Blood Banks (AABB) Annual Meeting, Baltimore, MD, abstract # S12-010B (oral abstract)
2011 Transfusion in Traumatic Hemorrhagic Shock Symposium, San Francisco, CA. (Invited Speaker)
2011 Annual Meeting of the American Association of Immunologists (AAI), San Francisco, CA, abstract # 169.36 (poster)
2011 Annual Meeting of the American Society of Hematology, San Diego, CA, abstract #718 (oral abstract)

2012 American Association of Blood Banks (AABB) Annual Meeting, Boston, MA, abstract #1402115 (oral abstract)
2013 Annual Meeting of the American Association of Immunologists (AAI), Honolulu, HI, abstract #69.10 (poster)
2014 Annual Meeting of the American Society of Hematology, San Francisco, CA, abstract #1562 (poster)
2015 American Association of Blood Banks (AABB) Annual Meeting, Anaheim, CA, abstract # S10-010B (oral abstract)
2017 American Association of Blood Banks (AABB) Annual Meeting, San Diego, CA, abstract # B12-A03B (oral abstract)
2018 American Association of Blood Banks (AABB) Annual Meeting, Boston, MA, abstract # CBIB20 (poster)
2018 Yale University Dermatology Department, Tomayko Lab Meeting (invited talk)

REGIONAL AND OTHER PRESENTATIONS

2008 Blood Systems Research Institute Lab Meeting
2009 Children's Hospital Oakland, Hematology/Oncology Conference
UCSF Department of Experimental Medicine Inter-Lab Meeting
Blood Systems Research Institute Lab Meeting
2010 UCSF Department of Experimental Medicine Inter-Lab Meeting
Blood Systems Research Institute Lab Meeting
UCSF Transplantation Research Lab Meeting
2011 Blood Systems Research Institute Lab Meeting
2012 UCSF Department of Experimental Medicine Inter-Lab Meeting
Blood Systems Research Institute Lab Meeting
2013 Blood Systems, Transfusion Medicine Academic and Policy Meeting Teleconference
Blood Systems Research Institute Lab Meeting
2014 Blood Systems Research Institute Lab Meeting
2015 Blood Systems Research Institute Lab Meeting
2016 Blood Systems Research Institute Lab Meeting
2017 Blood Systems Research Institute Lab Meeting
2018 Vitalant Research Institute Lab Meeting

CME COURSES ATTENDED

Not applicable

GOVERNMENT and OTHER PROFESSIONAL SERVICE

2006- 2007	Yale University, Provost's Office Worklife Child Care Sub-Committee	Committee Member
2017	National Institutes of Health, NHLBI	Special Emphasis Panel Member
2018	National Institutes of Health, NHLBI	Special Emphasis Panel Member

UNIVERSITY AND PUBLIC SERVICE

UNIVERSITY SERVICE

UCSF CAMPUS-WIDE

2017 Reviewer for UCSF Resource Allocation Program
2018 Reviewer for UCSF Resource Allocation Program

TEACHING and MENTORING

FORMAL SCHEDULED CLASSES FOR UCSF STUDENTS

Not applicable

PREDOCTORAL STUDENTS SUPERVISED OR MENTORED:

Dates	Name	Program or School	Role	Student's Current Position
2011	Christine Kyauk	UCB undergraduate	Summer intern	Masters Student, UCB School of Public Health
2016	Sabrina Media	UCB undergraduate	Summer intern	Undergraduate student, UCB

POSTDOCTORAL FELLOWS AND RESIDENTS DIRECTLY SUPERVISED OR MENTORED

Dates	Name	Fellow	Faculty Role	Current Position
2017-now	Johnson Q. Tran, PhD	Post-Doc	Research supervisor	Postdoctoral fellow, VRI

Other Completed Teaching and Mentoring Activities

2002 Yale University, Teaching Assistant: *Biology of the Immune System.* A graduate level course in immunology. Led a discussion section for a group of approximately 20 graduate students, assisted in restructuring of course, as well as writing and grading of problem sets and exams.

2003 Yale University, Teaching Assistant: *An Issues Approach to Biology:* Led and developed new curriculum for a discussion section covering a wide range of topics in biology for non-science majors. Included instruction in scientific principles and ethics, facilitation of discussion, generation and evaluation of projects, and grading exams.

INFORMAL TEACHING AND MENTORING

2008-now Directly trained and mentored 8 undergraduate and recent graduates over 6 summers as part of Vitalant Research Institute Summer Intern program. Included instruction in laboratory techniques and immunology. Participated as a lecturer teaching introductory immunology in an institute-wide weekly seminar series for interns.

2008-now Participated in weekly institute wide and smaller group meetings proving feedback to students and postdocs.

RESEARCH AND CREATIVE ACTIVITIES

RESEARCH AWARDS AND GRANTS

CURRENT

1R01HL133024-01 (Jackman) 07/01/16 – 04/30/19

NIH/NHLBI

Mechanisms regulating alloimmunization and tolerance with pathogen reduction and transfusion of allogeneic platelets

The goal of this study is to establish a reductionist murine model in order to identify the mechanisms regulating the alloresponse to pathogen reduction technology treated platelets.
Role: Principal Investigator

R01 HL134653 (Kanias) 01/01/18 – 12/31/22
NIH/NHLBI
Effect of blood donor sex and testosterone on predisposition to hemolysis in stored red blood cells
The goal of this study is to use innovative human and mouse studies to evaluate the impact of donor sex and testosterone on transfusion outcomes and to map out down-stream p38 MAPK signaling pathways that modulate RBC structure, function and integrity during storage and transfusion.
Role: Co-Investigator

11516 (Jackman) 01/01/19 – 12/31/19
Blood Systems Inc.
Jackman Research Program
Primary aims are to examine the rates and severity of alloimmunization in different patient cohorts, looking at causes, prevention, and health outcomes, and to evaluate mechanisms regulating these responses with animal models.
Role: Principal Investigator

COMPLETED RESEARCH SUPPORT
R56HL120970 (Lanteri) 09/01/14 – 08/31/16
NIH/NHLBI
Persistence of WNV RNA in blood and the risk of transfusion transmission
The goal of this study is to characterize WNV blood and organ compartmentalization in WNV infected mice, to perform transfusion experiments with blood harvested from WNV infected mice at different times pre- and post-seroconversion into immunocompetent and immunocompromised mice, and to identify the blood compartments and tissues most likely to transmit the virus to immunocompromised mice.
Role: Co-Investigator

11146 (Jackman) 03/15/13 – 10/31/15
TerumoBCT
Tolerance and Prevention of Alloimmunization with Mirasol-Treated Platelet Rich Plasma
The purpose of this project is to determine the impact of Mirasol treatment on the immune response to repeated transfusions with allogeneic platelets, to see if either tolerance is induced, or if exposed mice become alloimmunized.
Role: Principal Investigator

R01 HL-083388 (Busch) 09/01/06 – 07/31/12
NIH / NHLBI
Mechanisms and Clinical Effects of Microchimerism in Transfused Trauma Patients
Investigate frequency of persistence of donor leukocytes in patients transfused following severe injury.
Role: Post-doctoral Fellow

W81XWH-09-2-0100 (Goodrich) 03/01/10 – 08/31/12
DoD
A Transportable Pathogen Reduction System for Treatment of Whole Blood
The aims of this project were to measure immune modulation in subjects receiving Mirasol treated RBC units.
Role: Post-doctoral Fellow

10376 (Norris) 12/06/07 – 12/31/08
Gambro BCT
Evaluation of pathogen reduction and platelet refractoriness
Role: Post-doctoral Fellow

PEER-REVIEWED PUBLICATIONS

1. Louie, L.G., Hartogensis, W.E., Jackman, R.P., Schultz, K.A., Zijenah, L.S., Yiu, C.H., Nguyen, V.D., Sohsman, M.Y., Katzenstein, D.K., and Mason, P.R. (2004). "Mycobacterium tuberculosis/HIV-1 coinfection and disease: role of human leukocyte antigen variation." *Journal of Infectious Disease* **189**(6): 1084-90.

2. Jackman, R. P., Balamuth, F, Bottomly, K. (2007). "CTLA-4 differentially regulates the immunological synapse in CD4 T cell subsets." *Journal of Immunology*. **178**(9): 5543-51.

3. Jackman R.P., Heitman J.W., Marschner S., Goodrich R.P., Norris P.J. (2009). "Understanding loss of donor white blood cell immunogenicity after pathogen reduction: mechanisms of action in ultraviolet illumination and riboflavin treatment." *Transfusion* **49**(12):2686-99. PMCID: PMC2865145.

4. Jackman, R.P., Utter, G.H., John W Heitman, J.W., Hirschkorn, D.F., Law, J.P., Gefter, N., Busch, M.P., Norris, P.J. (2011). "Effects of Blood Sample Age at Time of Separation on Measured Cytokine Concentrations in Plasma." *Clinical and Vaccine Immunology* **18**(2):318-326.

5. Jackman, R.P., Utter, G.H., Muench, M.O., Heitman, J.H., Munz, M.M., Jackman, R.W., Biswas, H., Rivers, R.M., Tobler, L.H., Busch, M.P., Norris, P.J. (2012). "Distinct roles of trauma and transfusion in induction of immune dysregulation post-injury." *Transfusion* **52**(12): 2533-50. PMC3392528.

6. Jackman, R.P., Muench, M.O., Heitman, J.H., Law, J.P., Inglis, H., Marschner S., Goodrich R.P., Norris P.J. (2013). "Immune Modulation and Lack of Alloimmunization Following Transfusion with Pathogen Reduced Platelets in Mice." *Transfusion* **53**(11):2697-2709

7. Jackman, R.P., Deng, X., Bolgiano, D., Lebedeva, M., Heitman, J.W., Busch, M.P., Slichter, S., Norris P.J. (2013). "Low-level HLA antibodies do not predict platelet transfusion failure in TRAP study participants." *Blood* **121**(16):3261-3266.

8. Danesh, A., Inglis, H.C., Jackman, R.P., Wu, S., Deng, X., Muench, M.O., Heitman, J.W., Norris, P.J. (2014). "Exosomes from red blood cell units bind to monocytes and induce proinflammatory cytokines, boosting T-cell responses in vitro." *Blood* **123**(5):687-96.

9. Jackman, R.P., Deng, X., Bolgiano, D., Utter, G.H., Schechterly, C., Lebedeva, M., Heitman, J.W., Operskalski, E., Luban, N.L., Alter, H., Busch, M.P., Slichter, S., Norris P.J. (2014). "Leukoreduction and UV treatment reduce both the magnitude and duration of the anti-HLA antibody response." *Transfusion* **54**(3):672-80.

10. Jackman, R.P., Lee, J-H., Pei, R., Bolgiano, D., Lebedeva, M., Slichter, S., Norris P.J. (2016). "C1q-binding anti-HLA antibodies do not predict platelet transfusion failure in TRAP study participants." *Transfusion*, **56**(6):1442-1450.

11. Muench, M.O., Heitman, J.H., Inglis, H., Fomin, M., Marschner S., Goodrich R.P., Norris P.J., Jackman, R.P. (2016) "Reduced alloimmunization in mice following repeated transfusion with

pathogen-reduced platelets." *Transfusion*, **56**(6):1419–1429.

12. Jackman, R.P., Muench, M.O., Inglis, H., Heitman, J.H., Marschner S., Goodrich R.P., Norris P.J. (2017). "Reduced MHC Alloimmunization and Partial Tolerance Protection With Pathogen Reduction Of Whole Blood." *Transfusion*, **57**(2):337–348.

13. Jackman, R.P., Cruz, G.I., Nititham, J., Triulzi, D.J., Barcellos, L.F., Criswell, L.A., Norris, P.J., Busch, M.P. (2018). "Increased Allo and Auto Reactive Anti-Human Leukocyte Antigen Antibodies Associated With Systemic Lupus Erythematosus and Rheumatoid Arthritis." *Lupus Science & Medicine*, 5(1):e000278.

14. Tran, J.Q., Muench, M.O., Heitman, J.W., Jackman, R.P. (2019). "Allogeneic major histocompatibility complex antigens are necessary and sufficient for partial tolerance induced by transfusion of pathogen reduced platelets in mice." *Vox Sanguinis*, In Press.

NON-PEER REVIEWED PUBLICATIONS AND OTHER ACTIVITIES

Review Articles

1. Bloch, E.M., Jackman, R.P., Lee, T-H, and Busch, M.P. (2012). "Transfusion Associated Microchimerism: The Hybrid Within." *Transfusion Medicine Reviews* **27**(1):10-20.

2. Jackman, R.P. (2013). "Immunomodulation in transfused trauma patients." *Current Opinion in Anesthesiology* **26**(2):196-203.

RESEARCH CONTRIBUTION TO SCIENCE

My long-term research goals are to improve our understanding of the wide range of immune consequences to allogeneic exposure and to identify methods to modulate these responses to protect against alloimmunization and rejection. My graduate work looked at how different subsets of T helper cells communicate with antigen presenting cells through differential organization of the immunological synapse, and how this is regulated by expression of costimulatory molecules. This work gave me a great deal of insight into the balance of activating and inhibitory signals involved in interactions between cells of the immune system, and strong training in basic cellular immunology. Over the last decade I have been working at Vitalant Research Institute (VRI, formerly Blood Systems Research Institute) in the field of transfusion immunology. I began my work at VRI studying transfusion immunology in humans, with a particular interest in alloimmunization, tolerance, and immunomodulation caused by traumatic injury and pathogen reduction, and soon began to complement this work with animal models, applying expertise from my graduate training. Over the last ten years I have successfully developed and worked with novel murine models of blood transfusion, pathogen reduction and traumatic blood loss and their impact on immune responsiveness and alloimmunization. I have also continued my work with clinical samples studying the regulation of alloimmunization resulting from transfusion or other exposures such as pregnancy, and how these outcomes are influenced by underlying disease and clinical intervention, which has been an important complement to my work with animal models.

One major area of ongoing research is the effect of pathogen reduction on transfusion-associated alloimmunization. Pathogen reduction technology (PRT) is a new recently FDA approved treatment developed to kill undetected pathogens found in blood products using photo-activators and UV light to permanently damage any DNA present in the blood product. This treatment was also shown to impact

white blood cells in these products, not only killing them, but also making them less immunogenic in a mixed lymphocyte reaction. I was able to demonstrate this loss of immunogenicity includes not only a failure to stimulate proliferation, but also a failure to stimulate any sign of activation in allogeneic T cells due to a down regulation of key adhesion molecules on the surface of treated cells that prevents productive interaction with allogeneic T cells. Utilizing my murine model I have also been able to show that this treatment prevents alloimmunization from occurring *in vivo*, and may even offer some tolerogenic signals protecting recipients from alloresponses to subsequent exposures. Using congenic strains, we have shown that allogeneic MHC is both necessary and sufficient for induction of tolerance with PRT treated platelets. Ongoing work has shown that the protective effect is associated with the quasi-apoptotic state induced in white blood cells by PRT, and that transfusion with PRT treated products alters the composition and activation of APCs in the spleen, blunts T cell responses to subsequent untreated exposures, and induces TGFb production by dendritic cells, macrophages, and T_{regs}. A pending renewal of this R01 would continue our mechanistic work on how PRT alters the alloimmune response, but would also evaluate how PRT interacts with other current transfusion practices as it is increasingly implemented in the clinic.

1. Jackman R.P., Heitman J.W., Marschner S., Goodrich R.P., Norris P.J. (2009). "Understanding loss of donor white blood cell immunogenicity after pathogen reduction: mechanisms of action in ultraviolet illumination and riboflavin treatment." *Transfusion* 49(12):2686-99. PMC2865145.
2. Jackman, R.P., Muench, M.O., Heitman, J.H., Law, J.P., Inglis, H., Marschner S., Goodrich R.P., Norris P.J. (2013). "Immune Modulation and Lack of Alloimmunization Following Transfusion with Pathogen Reduced Platelets in Mice." *Transfusion*. 53(11): 2697-709. PMID: 23451715
3. Muench, M.O., Heitman, J.H., Inglis, H., Fomin, M.E., Marschner S., Goodrich R.P., Norris P.J., Jackman, R.P. (2016). "Reduced Alloimmunization in Mice Following Repeated Transfusion with Pathogen Reduced Platelets." *Transfusion*, 56(6):1419-1429. PMID: 27028210
4. Jackman, R.P., Muench, M.O., Inglis, H., Heitman, J.H., Marschner S., Goodrich R.P., Norris P.J. (2017). "Reduced MHC Alloimmunization and Partial Tolerance Protection With Pathogen Reduction Of Whole Blood." *Transfusion*, **57**(2):337–348.
5. Tran, J.Q., Muench, M.O., Heitman, J.W., Jackman, R.P. (2019). "Allogeneic major histocompatibility complex antigens are necessary and sufficient for partial tolerance induced by transfusion of pathogen reduced platelets in mice." *Vox Sanguinis*, In Press.

I am also interested in evaluation of frequency of alloimmunization along with clinical consequences in different settings. Alloimmunization and subsequent platelet refractoriness is an important problem for many recipients of repeated platelet transfusions. The TRAP study was a key trial designed to address this issue and had shown that many patients become refractory to platelet transfusion in the absence of detected antibodies against HLA, but as the assays used to detect these antibodies were not very sensitive, it was unknown if the observed platelet refractoriness was actually antibody independent, or being driven by low level antibodies that had gone undetected. Utilizing banked samples from this study along with newer more sensitive HLA antibody assays I have been able to demonstrate that while many of these refractory patients do in fact have antibodies against HLA antigens that were previously undetected, that the presence of low level antibodies is not associated increased risk of platelet refractoriness. This work has important clinical implications and the paper was chosen by *Blood* to be used for continuing medical education credit. By combining historic samples from this study and others, I was also able to demonstrate that while leukoreduction and ultraviolet light do not eliminate the HLA antibody response, they both reduce the magnitude and duration of this response, which may be sufficient to offer protection from antibody mediated platelet refractoriness. We have also recently demonstrated that both Lupus and Rheumatoid Arthritis are associated with double the risk of developing anti-HLA antibodies during pregnancy, and that these anti-HLA antibodies can also be found in these patients even in the absence of pregnancy or other alloexposure, and that these antibodies are associated with some negative clinical outcomes.

1. Jackman, R.P., Deng, X., Bolgiano, D., Lebedeva, M., Heitman, J.W., Busch, M.P., Slichter, S., Norris P.J. (2013). "Low-level HLA antibodies do not predict platelet transfusion failure in TRAP study participants." *Blood* 121(16):3261-3266. PMC3630837.
2. Jackman R.P., Deng X., Bolgiano D., Utter G.H., Schechterly C., Lebedeva M., Operskalski E., Luban N.L., Alter H., Busch M.P., Slichter S.J., Norris P.J. (2014) Leukoreduction and ultraviolet treatment reduce both the magnitude and the duration of the HLA antibody response. *Transfusion* 54(3):672-80. PMC3825847.
3. Jackman, R.P., Lee, J-H., Pei, R., Bolgiano, D., Lebedeva, M., Slichter, S., Norris P.J. (2016). "C1q-binding anti-HLA antibodies do not predict platelet transfusion failure in TRAP study participants." *Transfusion*, 56(6):1442-1450. PMID: 27079754
4. Jackman, R.P., Cruz, G.I., Nititham, J., Triulzi, D.J., Barcellos, L.F., Criswell, L.A., Norris, P.J., Busch, M.P. (2018). "Increased Allo and Auto Reactive Anti-Human Leukocyte Antigen Antibodies Associated With Systemic Lupus Erythematosus and Rheumatoid Arthritis." Lupus Science & Medicine, 2018;5:e000278. doi: 10.1136/lupus-2018-000278

Finally, I am interested in the immunomodulation caused by transfusion and how this is altered by the underlying health of the recipient. Both transfusion and traumatic injury have been shown to have strong effects on the immune system. Trauma patients have been shown to be either immunosuppressed or hyperactivated making them vulnerable to serious immune sequelae such as sepsis and multiorgan failure, and it was previously thought that this was the result of initial immune activation followed by a compensating period of suppression. Using samples collected from transfused and non-transfused trauma patients starting with arrival in hospital and tracking for up to a year after injury, I screened for over 40 soluble immune mediators in the circulation and demonstrated that a generally immunosuppressive cytokine milieu develops very early but that this includes some overlapping production of pro-inflammatory cytokines. I was also able to look at the impact of transfusion on this immune deregulation, developing a novel murine model to separate out the effects of traumatic blood loss and transfusion. I have since further adapted this murine model to look at the immunomodulatory impact of transfusion of different blood products in various settings. A pending R01 application ties in some of these ideas with our work in transfusion alloimmunization, evaluating how different forms of immune modulation that are common among transfusion recipients (such as viral or bacterial inflammation, injury, or chemotherapies), influence the alloresponse to foreign MHC.

1. Jackman, R.P., Utter, G.H., Muench, M.O., Heitman, J.H., Munz, M.M., Jackman, R.W., Biswas, H., Rivers, R.M., Tobler, L.H., Busch, M.P., Norris, P.J. (2012). "Distinct roles of trauma and transfusion in induction of immune dysregulation post-injury." *Transfusion* 52(12): 2533-50. PMC3392528.
2. Jackman, R.P., Utter, G.H., John W Heitman, J.W., Hirschkorn, D.F., Law, J.P., Gefter, N., Busch, M.P., Norris, P.J. (2011). "Effects of Blood Sample Age at Time of Separation on Measured Cytokine Concentrations in Plasma." *Clinical and Vaccine Immunology* 18(2):318-326. PMC3067358.
3. Danesh, A., Inglis, H.C., Jackman, R.P., Wu, S., Deng, X., Muench, M.O., Heitman, J.W., Norris, P.J. (2014) Exosomes from RBC units bind to monocytes and induce pro-inflammatory cytokines, boosting T cell responses in vitro. *Blood* 123(5):687-96. PMC3630837.