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## BIOGRAPHICAL SKETCH

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NAME Hildegard T. Greinix	POSITION TITLE Professor of Hematology and Oncology
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EDUCATION/TRAINING			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
Karl-Franzens University, Graz, Austria	M.D.	12/83	Medicine
Karl-Franzens University, Graz, Austria	Residency	84-86	Internal Medicine
Karl-Franzens University, Graz, Austria	Fellowship	86-89	Hematology and Oncology
Fred Hutchinson Cancer Research Center, Seattle, WA	Fellowship	89-91	Bone Marrow Transplantation

### A. Personal Statement

I have a long-standing research interest in allogeneic hematopoietic cell transplantation (HCT) including transplant immunology with acute and chronic graft-versus-host disease (GVHD) and induction of transplant tolerance. I have been actively participating in numerous clinical trials focusing on different areas of hematology and HCT with special emphasis on prevention, diagnosis and treatment of GVHD in adults after HCT. I am a participant in the NIH Consensus Development Project on diagnosis and response evaluation in chronic GVHD and participated within the German/Austrian/Swiss Consensus Group on GVHD in research projects for implementation of these novel criteria and diagnostic tools into clinical practice. I have been the Chair of the GVHD Subcommittee of the Transplant Complications Working Party of the European Society for Blood and Marrow Transplantation (EBMT) until 2018 and have been organizing training courses for physicians and nurses on GVHD during the last years. I successfully established extracorporeal photopheresis (ECP) as salvage treatment for patients with corticosteroid-refractory acute and chronic GVHD and had a leading role in the design and conduct of prospective phase II studies investigating ECP in acute and chronic GVHD.

Translational research projects focused on mechanisms of action of ECP. I extended my research to immune-based soluble and cellular biomarkers with a main focus on B cell subpopulations predictive and diagnostic for chronic GVHD. My research group was among the first to describe a significant distortion of B cell homeostasis in active chronic GVHD including the impact of alloreactivity on humoral immunity and impairment of immune reconstitution after allogeneic HCT. Some of our findings are reminiscent to ones observed in patients with autoimmune disorders.

Another main preclinical and clinical research interest consists of the exploitation of immunotherapeutic strategies in hematologic malignancies including posttransplant cellular therapies and adoptive cellular immunotherapies including CAR-T-Cell therapies.

My research has been funded through European Commission Research grants and national grant support.

I have been member of the Executive Committee of the Worldwide Network for Blood and Marrow Transplantation (WBMT) during the last years and participated in the organization of multiple workshops to foster international cooperation, to support establishment of transplant facilities worldwide and to enable educational and training activities. Furthermore, we worked on standards of care regarding HCT taking economical and regional country differences into consideration.

## **B. Positions and Honors**

### **Positions and Employment**

1984-1989	Fellow, Department of Internal Medicine, LKH Graz, Austria
1989-1991	Research Fellow at the Fred Hutchinson Cancer Research Center, Seattle, WA
1991-1992	Attending Physician at the Department of Hematology of the Medical University of Graz, Austria
1992-1995	Assistant Professor, Department of Internal Medicine I of the Medical University of Vienna, Austria
1995-1997	Associate Professor, Department of Internal Medicine I of the Medical University of Vienna, Austria
1998-2014	Professor, Department of Internal Medicine I of the Medical University of Vienna, Austria
Since 2015	Head of the Division of Hematology of the Medical University of Graz, Austria

### **Functions in Scientific and Governmental Organizations**

Since 1999	Member of the Transplant Committee of the Austrian Ministry of Health
Since 2000	Chair of the Austrian Stem Cell Transplant Working Group of the Austrian Society of Hematology and Oncology
2002-2008	Chair of the Clinical Working Group of the World Marrow Donor Association
2004-2006	President of the Austrian Society of Transplantation, Transfusion and Genetics
Since 2005	Member of the NIH Consensus Development Project on Chronic GVHD
Since 2010	Member of the Executive Board of the Worldwide Network for Blood and Marrow Transplantation
2010-2017	Member of the Commission for Blood Safety of the Austrian Ministry of Health
Since 2011	Chair of the Scientific Board of the German/Austrian/Swiss Consensus Group on Chronic GVHD
2011-2014	Vice-President of the Ethics Committee of the Medical University of Vienna
2012-2016	Member of the Scientific Committee of the European School of Haematology
2012-2018	Chair of the GVHD Subcommittee of the Transplant Complications Working Party of the EBMT
Since 2012	Member of the Commission for Radiation Protection of the Austrian Ministry of Health
2017-2019	Vice-President of the Austrian Society of Hematology and Oncology
2017-2020	Member of the Membership Committee of the European Haematology Association (EHA)
2017-2019	Member of the CIBMTR Advisory Committee
Since 2020	President of the Worldwide Network for Blood and Marrow Transplantation

### **Professional Memberships**

American Society of Hematology  
Austrian Society of Hematology and Oncology  
Austrian Society of Internal Medicine  
Austrian Society of Transplantation, Transfusion and Genetics  
European Group for Blood and Marrow Transplantation  
World Marrow Donor Association  
American Society for Blood and Marrow Transplantation  
European Hematology Association

## **C. Selected Peer-reviewed Publications**

1. Scheidl S, Zinke-Cerwenka W, Flick H, Gaal S, Avian A, **Greinix H**, Olschewski H. Whole body lung function test-derived outcome predictors in allogeneic stem cell transplantation. *Biology of Blood and Marrow Transplantation* 25: 29-36, 2019.
2. Schoemans HM, Goris K, van Durm R, Fieuws S, De Geest S, Pavletic SZ, Im A, Wolff D, Lee SJ, **Greinix H**, Duarte RF, Poire X, Selleslag D, Lewalle P, Kerre T, Graux C, Baron F, Maertens JA, Dobbels F. The eGVHD app has the potential to improve the accuracy of graft versus host disease assessment: a multicentre randomized controlled trial. *Haematologica* 103: 1698-1707, 2018.
3. Schoemans HM, Lee SJ, Ferrara JL, Wolff D, Levine JE, Schultz KR, Shaw BE,

- Flowers ME, Ruutu T, **Greinix H**, Holler E, Basak G, Duarte RF, Pavletic SZ. EBMT – NIH- CIBMTR Task Force position statement on standardized terminology & guidance for graft-versus-host disease assessment. *Bone Marrow Transplantation* 53: 1401-1415, 2018.
4. Worel N, Lehner E, Führer H, Kalhs P, Rabitsch W, Mitterbauer M, Hopfinger G, **Greinix HT**. Extracorporeal photopheresis as second-line therapy for patients with acute graft-versus-host disease: does the number of cells treated matter? *Transfusion* 58: 1045-1053, 2018.
  5. Wolff D, **Greinix H**, Lee SJ, Gooley T, Paczesny S, Pavletic S, Hakim F, Malard F, Jagasia M, Lawitschka A, Hansen JA, Pulanic D, Holler E, Dickinson A, Weissinger E, Edinger M, Sarantopoulos S, Schultz KR. Biomarkers in chronic graft-versus-host disease: quo vadis? *Bone Marrow Transplantation* 53: 832-837, 2018.
  6. Crossland RE, Norden J, Kralj Juric M, Pearce KF, Lendrem C, Bibby LA, Collin M, **Greinix HT**, Dickinson AM. Serum and extracellular vesicle microRNAs miR-423, miR-199, and miR93\* as biomarkers for acute graft-versus-host disease. *Frontiers in Immunology* 2017 Nov 10;8:1446. Doi:10.3389/fimmu.2017.
  7. Crossland RE, Norden J, Juric MK, Green K, Pearce KF, Lendrem C, **Greinix HT**, Dickinson AM. Expression of serum microRNAs is altered during acute graft-versus-host disease. *Frontiers in Immunology* 2017 Mar 24;8:308. doi: 10.3389/fimmu.2017.00308. eCollection 2017.
  8. Gratwohl A, Sureda A, Cornelissen J, Apperley J, Dreger P, Duarte R, **Greinix HT**, McGrath E, Kroeger N, Lanza F, Nagler A, Snowden JA, Niederwieser D, Brand R. Alloreactivity: the janus-face of hematopoietic stem cell transplantation. *Leukemia* 31: 1752-1759, 2017.
  9. Spindelboeck W, Schulz E, Uhl B, Kashofer K, Aigelsreiter A, Zinke-Cerwenka W, Mulabecirovic A, Kump PK, Halwachs B, Gorkiewicz G, Sill H, **Greinix H**, Högenauer C, Neumeister P. Repeated fecal microbiota transplantations attenuate diarrhea and lead to sustained changes in the fecal microbiota in acute, refractory gastrointestinal graft-versus-host disease. *Haematologica* 102: e210-e213, 2017.
  10. Weissinger EM, Human C, Metzger J, Hambach L, Wolf D, **Greinix HT**, Dickinson AM, Mullen W, Jonigk D, Kuzmina Z, Kreipe H, Schweier P, Böhm O, Türüchanow I, Ihlenburg-Schwarz D, Raad J, Durban A, Schiemann M, Könecke C, Diedrich H, Holler E, Beutel G, Krauter J, Ganser A, Stadler M. The proteome pattern cGVHD\_MS14 allows early and accurate prediction of chronic GVHD after allogeneic stem cell transplantation. *Leukemia* 31: 654-662, 2017.
  11. Kralj Juric M, Shevtsov M, Mozes P, Ogonek J, Crossland RE, Dickinson AM, **Greinix HT**, Holler E, Weissinger EM, Multhoff G. B-cell-based and soluble biomarkers in body liquids for predicting acute/chronic graft-versus-host disease after allogeneic hematopoietic stem cell transplantation. *Frontiers in Immunology* 7: 660, 2017. doi: 10.3389/fimmu.2016.00660.
  12. Juric MK, Ghimire S, Ogonek J, Weissinger EM, Holler E, van Rood JJ, Oudshoorn M, Dickinson A, **Greinix HT**. Milestones of hematopoietic stem cell transplantation – from first human studies to current developments. *Frontiers of Immunology* 7: 470, 2016 eCollection 2016 doi: [10.3389/fimmu.2016.00470](https://doi.org/10.3389/fimmu.2016.00470)
  13. Styczynski J, Tridello G, Gil L, Ljungman P, Hoek J, Iacobelli S, Ward KN, Cordonnier C, Einsele H, Socie G, Milpied N, Veelken H, Chevallier P, Yakoub-Agha I, Maertens J, Blaise D, Cornelissen J, Michallet M, Daguindau E, Petersen E, Passweg J, **Greinix H**, Duarte RF, Kröger N, Dreger P, Mohty M, Nagler A, Cesaro S. Impact of donor Epstein-Barr virus serostatus on the incidence of graft-versus-host disease in patients with acute leukemia after hematopoietic stem cell transplantation. *Journal of Clinical Oncology* 34:2212-2220, 2016
  14. **Greinix HT**, Kuzmina Z, Weigl R, Körmoczi U, Rottal A, Wolff D, Kralj M, Kalhs P, Mitterbauer M, Rabitsch W, Edinger M, Holler E, Pickl WF. CD19<sup>+</sup>CD21<sup>low</sup> B cells and CD4<sup>+</sup>CD45RA<sup>+</sup>CD31<sup>+</sup> T cells correlate with first diagnosis of chronic graft-versus-host disease. *Biology of Blood and Marrow Transplantation* 21: 250-258, 2015.
  15. Jagasia MH, **Greinix HT**, Arora M, Williams KM, Wolff D, Cowen EW, Palmer J, Weisdorf D, Treister NS, Cheng G, Kerr H, Stratton P, Duarte RF, McDonald GB, Inamoto Y, Vigorito A, Arai S, Datile MB, Jacobsohn D, Heller T, Kitko CL, Mitchell SA, Martin PJ, Shulman H, Wu RS, Cutler CS, Vogelsang GB, Lee SJ, Pavletic SZ, Flowers ME. National Institutes of Health Consensus Development Project on Criteria for Clinical Trials in Chronic Graft-versus-Host Disease: I. The 2014 Diagnosis and Staging Working Group Report. *Biology of Blood and Marrow Transplantation* 21: 389-401, 2015.

16. Brügggen MC, Klein I, Greinix HT, Bauer W, Kuzmina ZJ, Rabitsch W, Kalhs P, Petzelbauer P, Knobler R, Stingl G, Stary G. Diverse T cell responses characterize the different manifestations of cutaneous graft-versus-host disease. *Blood* 123: 290-299, 2014.
17. Greinix HT, Worel N, Just U, Knobler R. Extracorporeal photopheresis in acute and chronic graft-versus-host disease. *Transfusion and Apheresis Sciences* 2014 April 13. doi:10.1016/j.transci.2014.04.005 (Epub ahead of print).
18. Kuzmina Z, Krenn K, Petkov V, Körmöczi U, Weigl R, Rottal A, Kalhs P, Mitterbauer M, Ponhold L, Dekan G, Greinix HT, Pickl WF. CD19<sup>+</sup>CD21<sup>low</sup> B-cells and patients at risk for NIH-defined chronic graft-versus-host disease with bronchiolitis obliterans syndrome *Blood* 121: 1886-1895, 2013
19. Wolff D, Ayuk F, Elmaagacli A, Bertz H, Lawitschka A, Schleuning M, Meyer RG, Gerbitz A, Hilgendorf I, Hildebrandt GC, Edinger M, Klein S, Halter J, Mousset S, Holler E, Greinix H. Current practice in diagnosis and treatment of acute graft-versus-host disease – results from a survey among German-Austrian-Swiss HSCT centers. *Biology of Blood and Marrow Transplantation* 19: 767-776, 2013
20. Jagasia M, Greinix H, Robin M, Das-Gupta E<sup>\*</sup>, Jacobs R, Savani BN, Engelhardt BG, Kassim A, Worel N, Knobler R, Russell N, Socie G: Extracorporeal photopheresis versus anticytokine therapy as a second-line treatment for steroid refractory acute GVHD: A multicenter comparative analysis *Biology of Blood and Marrow Transplantation* 19: 1124-1135, 2013
21. Weissinger E, Metzger J, Döbelstein C, Wolff D, Schleuning M, Kuzmina Z, Greinix H, Dickinson AM, Mullen W, Kreipe HH, Hamwi I, Morgan MA, Krons A, Tchegotarenko I, Ihlenburg-Schwarz D, Dammann E, Collin M, Ehrlich S, Diedrich H, Stadler M, Eder M, Holler E, Mischak H, Krauter J, Ganser A: Proteomic peptide profiling for preemptive diagnosis of acute graft-versus-host disease after allogeneic stem cell transplantation. *Leukemia* 28: 842-852, 2014
22. Durate RF, Greinix H, Rabin B, Mitchell SA, Basak G, Wolff D, Madrigal A, Pavletic SZ, Lee SJ. Uptake and use of recommendations for the diagnosis, severity scoring and management of chronic graft-versus-host disease: An international survey of the EBMT-NCI Chronic GVHD Task Force. *Bone Marrow Transplantation* 49: 49-54, 2014.
23. Kuzmina Z, Eder S, Böhm A, Pernicka E, Vormittag L, Kalhs P, Petkov V, Stary G, Nepp J, Knobler R, Just U, Krenn K, Worel N, Greinix HT: Significantly worse survival of patients with NIH-defined chronic graft-versus-host disease and thrombocytopenia or progressive onset type: results of a prospective study. *Leukemia* 26: 746-756, 2012.
24. Greinix HT, van Besien K, Elmaagacli AH, Hillen U, Grigg A, Knobler R, Parenti D, Reddy V, Theunissen K, Michallet M, Flowers MED: Progressive improvement in cutaneous and extracutaneous chronic graft-versus-host disease after a 24-week course of extracorporeal photopheresis – results of a cross-over randomized study. *Biology of Blood and Marrow Transplantation* 17: 1775-1782, 2011
25. Kuzmina Z, Greinix HT, Weigl R, Körmöczi U, Rottal A, Frantal S, Eder S, Pickl WF: Significant differences in B-cell subpopulations characterize patients with chronic graft-versus-host disease associated dysgammaglobulinemia. *Blood* 117: 2265 – 2274, 2011
26. Wolff D, Schleuning M, van Harsdorf S, Bacher U, Gerbitz A, Stadler M, Ayuk F, Kiani A, Schwerdtfeger R, Vogelsang GB, Kobbe G, Gramatzki M, Lawitschka A, Mohty M, Pavletic SZ, Greinix H, Holler E: Consensus conference on clinical practice in chronic GVHD: Second line treatment of chronic graft-versus-host disease. *Biology of Blood and Marrow Transplantation* 17: 1-17, 2011
27. Greinix HT, Løddenkemper C, Pavletic SZ, Holler E, Socie G, Lawitschka A, Halter J, Wolff D: Diagnosis and staging of chronic graft-versus-host disease in the clinical practice. *Biology of Blood and Marrow Transplantation* 17: 167-175, 2011.
28. Wolff D, Gerbitz A, Ayuk F, Kiani A, Hildebrandt GC, Vogelsang GB, Elad S, Lawitschka A, Socie G, Pavletic SZ, Holler E, Greinix H: Consensus conference on clinical practice in chronic graft-versus-host disease (GVHD): First-line and topical treatment of chronic GVHD. *Biology of Blood and Marrow Transplantation* 16: 1611-1628, 2010.
29. Kuzmina Z, Greinix HT, Knobler R, Worel N, Kouba M, Weigl R, Körmöczi U, Rottal A, Pohlreich D, Zielinski C, Pickl WF: Proportions of immature CD19<sup>+</sup>CD21<sup>-</sup> B-lymphocytes predict the response to extracorporeal photopheresis in patients with chronic graft-versus-host disease. *Blood* 114: 744-746, 2009.
30. Flowers ME, Apperley JF, van Besien K, Elmaagacli A, Grigg A, Reddy V, Bacigalupo A, Kolb HJ, Bouzas L, Michallet M, Prince HM, Knobler R, Parenti D, Gallo J, Greinix HT. A multicenter prospective phase II randomized study of extracorporeal photopheresis for treatment of chronic graft-versus-host disease. *Blood* 112: 2667-2674, 2008.

## **D. Research Support**

**COST:** Grant of the European Union since 2018

**Celleurope:** Grant of the European Commission from 2012-2017, national PI within an European Research Consortium.

Goals: Improving outcome of allogeneic hematopoietic cell transplantation by validation of biomarkers and development of novel cellular therapies including extracorporeal photopheresis.

**Impact 1393:** Grant of the European Commission from 2010-2013

**Stemdiagnostics:** Grant of the European Commission from 2007 to 2010, national PI within an European Research Consortium.

Goals: Development of predictive and diagnostic tools for identifying the time of onset of chronic graft-versus-host disease and for monitoring of its activity and response to immunomodulatory therapy.

**Transnet:** Grant of the European Commission from 2005-2009, national PI within an European Research Consortium.

Goals: Identification of genomic and biological markers as predictive, diagnostic and therapeutic tools for use in hematopoietic cell transplantation, translational research towards individualized patient medicine.

**Austrotransplant Research Grant** from 2009-2011: National PI.

Goals: Role of B lymphocytes in development and maintenance of chronic graft-versus-host disease.

**National Research Grants** since 2000 in all areas of hematology and HCT.