

10. Literatur

1. Häyry P, Yilmaz S. Chronic allograft rejection: an update. *Transplant Proc* 1994, 26: 3159-3160.
2. Paul LC, Fellström B. Chronic vascular rejection of the heart and the kidney--have rational treatment options emerged? *Transplantation* 1992; 53: 1169.
3. Tilney NL, Whitley WD, Diamond JR, Kupiec-Weglinski JW, Adams DH. Chronic rejection--an undefined conundrum. *Transplantation* 1992; 52: 389-398.
4. Tullius SG, Tilney NL. Both alloantigen-dependent and -independent factors influence chronic allograft rejection. *Transplantation* 1995; 9: 313-318.
5. Buhler LH, Spitzer TR, Sykes M, Sachs DH, Delmonico FL, et al. Induction of kidney allograft tolerance after transient lymphohematopoietic chimerism in patients with multiple myeloma and end-stage renal disease. *Transplantation* 2002; 74 : 1405.
6. Wekerle T, Kurtz J, Sayegh MH, Ito H, Wells AD, Bensinger S, Shaffer J, Turka LA, Sykes M. Peripheral deletion after bone marrow transplantation with costimulatory blockade has features of both activation-induced cell death and passive cell death. *J Immunol* 2002; 166: 2311-2316.
7. Tomita Y, Khan A, Sykes M. Role of intrathymic clonal deletion and peripheral anergy in transplantation tolerance induced by bone marrow transplantation in mice conditioned with a non-myeloablative regimen. *J Immunol* 1994; 153: 1087-1098.
8. Wekerle T, Sykes M. Mixed chimerism as an approach for the induction of transplantation tolerance. *Transplantation* 1999; 68: 459-467.
9. Sykes M. Mixed chimerism and Transplant Tolerance. *Immunity* 2001; 14: 417-424.
10. Jones ND, Fluck NC, Roelen DL, Mellor AL, Morris PJ, Wood KJ. Deletion of alloantigen-reactive thymocytes as a mechanism of adult tolerance induction following intrathymic antigen administration. *Eur J Immunol* 1997; 27: 1591-1600.
11. Cobbold SP, Martin G, Qin S, Waldmann H. Monoclonal antibodies to promote marrow engraftment and tissue graft tolerance. *Nature* 1986; 323: 164-165.
12. Durham MM, Bingaman AW, Adams AB, Ha J, Waitze SY, Pearson TC, Larsen C.P. Cutting edge: administration of anti-CD40 ligand and donor bone marrow leads to hemopoietic chimerism and donor-specific tolerance without cytoreductive conditioning. *J Immunol* 2000; 165: 1-4.
13. Fuchimoto Y, Huang CA, Yamada K, Shimizu A, Kitamura H, Colvin RB, Ferrara V, Murphy MC, Sykes M, White-Scharf M et al. Mixed chimerism and tolerance without whole body irradiation in a large animal model. *J Clin Invest* 2000; 105: 1779-1789.

14. Huang CA, Fuchimoto Y, Sheir-Dolberg R, Murphy MC, Neville DM Jr, Sachs DH. Stable mixed chimerism and tolerance using a non-myeloablative preparative regimen in a large animal model. *J Clin Invest* 2000; 105: 173-181.
15. Dey B, Sykes M, Spitzer TR. Outcomes of combined bone marrow and solid organ transplants: a review. *Medicine* 1998; 77: 355-369.
16. Kawai T, Cosimi AB, Colvin RB, Powelson J, Eason J, Kozlowski T, Sykes M, Monroy R, Tanaka M, Sachs DH. Mixed allogeneic chimerism and renal allograft tolerance in cynomolgous monkeys. *Transplantation* 1995; 59: 256-262.
17. Kenyon NS, Chatzipetrou M, Masetti M, Ranuncoli A, Oliveira M, Wagner JL, Kirk AD, Harlan DM, Burkly LC, Ricordi C. Long-term survival and function of intrahepatic islet allografts in rhesus monkeys treated with humanized anti-CD154. *Proc Natl Acad Sci USA* 1999; 96: 8132-8137.
18. Kirk AD, Burkly LC, Batty DS, Baumgartner RE, Berning JD, Buchanan K, Fechner JH, Germond RL, Kampen RL, Petterson NB et al. Treatment with humanized monoclonal antibody against CD154 prevents acute renal allograft rejection in nonhuman primates. *Nat Med* 1999; 5: 686-693.
19. Larsen CP, Elwood ET, Alexander DZ, Ritchie SC, Hendrix R, Tucker-Burden C, Cho HR, Aruffo A, Hellenbaugh D, Linsley PS et al. Long-term acceptance of skin and cardiac allografts after blocking CD40 and CD28 pathways. *Nature* 1996; 381: 434-438.
20. Wekerle T, Sayegh MH, Hill J, Zhao Y, Chandraker A, Swenson KG, Zhao G, Sykes M. Extrathymic T cell deletion and allogeneic stem cell engraftment induced with costimulatory blockade is followed by central T cell tolerance. *J Exp Med* 1998; 187: 2037-2044.
21. Wekerle T, Kurtz J, Ito H, Ronquillo JV, Dong V, Zhao G, Shaffer J, Sayegh MH, Sykes M. Allogeneic bone marrow transplantation with costimulatory blockade induces macrochimerism and tolerance without cytoreductive host treatment. *Nat Med* 2000; 6: 464-469.
22. Spitzer TR, Delmonico F, Tolkoff-Rubin N, McAfee S, Sackstein R, Saidman S, Colby C, Sykes M, Sachs DH, Cosimi AB. Combined histocompatibility leukocyte antigen-matched donor bone marrow and renal transplantation for multiple myeloma with end stage renal disease: the induction of allograft tolerance through mixed lymphohematopoietic chimerism. *Transplantation* 1999; 68: 480-484.
23. Fabre JW, Morris PJ. The mechanism of specific immunosuppression of renal allograft rejection by donor strain blood. *Transplantation* 1972; 14: 634-40.
24. Fabre JW, Morris PJ. The effect of donor strain blood pretreatment on renal allograft rejection in rats. *Transplantation* 1972, 14(5): 608-17.
25. Dallman MJ, KJ Wood, and PJ Morris. Specific cytotoxic T cells are found in the nonrejected kidneys of blood-transfused rats. *J Exp Med* 1987; 165: 566-571

26. Qin S, Cobbold SP, Pope H, Elliott J, Kioussis D, Davies J, Waldmann H. "Infectious" transplantation tolerance. *Science* 1993; 259 (5097): 974-7.
27. Chen ZK, Cobbold SP, Waldmann H, Metcalfe S. Amplification of natural regulatory immune mechanisms for transplantation tolerance. *Transplantation* 1996; 62: 1200-6.
28. Bushell A, Niimi M, Morris PJ, Wood KJ. Evidence for immune regulation in the induction of transplantation tolerance: a conditional but limited role for IL-4. *J Immunol* 1999; 162: 1359-1366.
29. Smith JA, JY Tso, MR. Clark, MS. Cole, JA. Bluestone. Nonmitogenic Anti-CD3 Monoclonal Antibodies Deliver a Partial T Cell Receptor Signal and Induce Clonal Anergy. *J Exp Med* 1997; 185/8: 1413-1422.
30. Bisikirska B, Colgan J, Luban J, Bluestone JA, Herold KC. TCR stimulation with modified anti-CD3 mAb expands CD8+ T cell population and induces CD8+CD25+ Tregs. *J Clin Invest* 2005; 115(10): 2904-13.
310. Siegling A, Lehmann M, Riedel H, Platzner C, Brock J, Emmrich F, Volk HD. A nondepleting anti-rat CD4 monoclonal antibody that suppresses T helper 1-like but not T helper 2-like intragraft lymphokine secretion induces long-term survival of renal allografts. *Transplantation* 1994; 57(3): 464-7.
321. Lehmann M, Risch K, Nizze H, Brandenburg G, Ritter T, Brock J, Volk HD. Abolition of anti-CD4-induced allotransplantation tolerance by exogenous IL-2. *Transplant Proc* 1999; 31(1-2): 1220-1.
332. Lehmann M, Graser E, Risch K, Hancock WW, Muller A, Kuttler B, Hahn HJ, Kupiec-Weglinski JW, Brock J, Volk HD. Anti-CD4 monoclonal antibody-induced allograft tolerance in rats despite persistence of donor-reactive T cells. *Transplantation* 1997; 64(8): 1181-7.
343. Sawitzki B, Kieselbach B, Fisser M, Meisel C, Vogt K, Gaestel M, Lehmann M, Risch K, Grutz G, Volk HD. IFN-gamma regulation in anti-CD4 antibody-induced T cell unresponsiveness. *J Am Soc Nephrol* 2004; 15(3): 695-703.
35. Martins PN, Pratschke J, Pascher A, Fritsche L, Frei U, Neuhaus P, Tullius SG. Age and immune response in organ transplantation. *Transplantation* 2005 Jan 27; 79(2): 127-32.
36. Princeteau M. Greffe rénale. *J Med Bord* 1905; 26: 549.
37. Williams P. Notes on diabetes treated with extract and by grafts of sheep's pancreas. *Br Med J* 1894; 2: 1303.
38. Schuurman H, Cheng J, Lam T. Pathology of xenograft rejection: a commentary. *Xenotransplantation* 2003; 10: 293.
39. Robson S, Schulte am Esch J, Bach F. Factor in xenograft rejection. *Ann N Y Acad Sci* 1999; 875: 261.
40. Cramer D. Natural antibodies and the host immune responses to xenografts. *Xenotransplantation* 2000; 7: 83.

41. Soin B, Vial C, Frind P. Xenotransplantation. *Br J Surg* 2000; 87: 138.
42. Galili U, Clark M, Shohet S, Buehler J, Macher B. Evolutionary relationship between the natural anti-Gal antibody and the Gal alpha 1–3Gal epitope in primates. *Proc Natl Acad Sci U S A* 1987; 84: 1369.
43. Mollnes T, Fiane A. Perspectives on complement in xenotransplantation. *Mol Immunol* 2003; 40: 135.
44. Chen G, Sun Q, Wang X, Shen S, Guo H, Wang H, et al. Improved suppression of circulating complement does not block acute vascular rejection of pig-to-rhesus monkey cardiac transplant. *Xenotransplantation* 2004; 11: 123.
45. Shimizu A, Meehan S, Kozlowski T. Acute humoral xenograft rejection: destruction of the microvasculature capillary endothelium in pig-to-nonhuman primate renal grafts. *Lab Invest* 2000; 80: 815.
46. Pino-Chavez G. Differentiating acute humoral from acute cellular rejection histopathologically. *Graft* 2001; 4: 60.
47. Popma S, Krasinskas A, Kreisel D. Allosensitization increases human anti-pig cellular xenoreactivity. *J Heart Lung Transplant* 2000; 19: 67.
48. Blancho G, Barreau N, Souillou J. Determining whether HLA-sensitized patients will be suitable xenotransplant candidates. *Graft* 2001; 4: 135.
49. Varela I, Mozo P, Cortes A, Blanco C, Canedo F. Cross-reactivity between swine leucocyte antigen and human anti-HLA specific antibodies in sensitized patients awaiting renal transplantation. *J Am Soc Nephrol* 2003; 14: 2677.
50. Ye Y, Luo Y, Kobayashi T. Secondary organ allografting after primary bridging xenotransplantation. *Transplantation* 1995; 60: 19.
51. Baertshiger R, Dor F, Prabharasuth D, Kuwaki K, Cooper D. Absence of humoral and cellular alloreactivity in baboons sensitized to pig antigens. *Xenotransplantation* 2004; 11: 27.
52. Levy M, Crippin J, Sutton S. Liver allotransplantation after extracorporeal hepatic support with transgenic porcine livers: clinical results and lack of pig-to-human transmission of the porcine endogenous retrovirus. *Transplantation* 2000; 69: 272.
53. Lambrigts D, Sahcs D, Cooper D. Discordant organ xenotransplantation in primates. *Transplantation* 1998; 66: 547.
54. Hammer C, Thein E. Physiological aspects of xenotransplantation, 2001. *Xenotransplantation* 2002; 9: 303.
55. Sen S, Hirasawa K, Smeby R, Bumpus F. Measurement of plasma renin substrate using homologous and heterologous renin. *Am J Physiol* 1971; 221: 1476.
56. Samstein B, Platt J. Physiologic and immunologic hurdles to xenotransplantation. *J Am Soc Nephrol* 2001; 12: 182.

57. White D. hDAF transgenic pig organ: are they concordant for human transplantation. *Xeno* 1996; 4: 50.
58. Byrne GW, McCurry KR, Kagan D, Quinn C, Martin MJ, Platt JL, Logan JS. Protection of xenogeneic cardiac endothelium from human complement by expression of CD59 or DAF in transgenic mice. *Transplantation* 1995; 60/10: 1149.
59. McCurry KR, Kooyman DL, Diamond LE, Byrne GW, Logan JS, Platt JL. Transgenic expression of human complement regulatory proteins in mice results in diminished complement deposition during organ xenoperfusion. *Transplantation* 1995; 59/8: 1177.
60. Fodor WL, Williams BL, Matis LA, et al. Expression of a functional human complement inhibitor in a transgenic pig as a model for the prevention of xenogeneic hyperacute organ rejection. *Proc Natl Acad Sci USA* 1994; 91: 11153.
61. Charreau B, Cassard A, Tesson L, et al. Protection of rat endothelial cells from primate complement-mediated lysis by expression of human CD59 and/or Decay Accelerating Factor. *Transplantation* 1994; 58/11: 1222.
62. Langford G, Yannoutsos, Cozzi E, et al. Production of pigs transgenic for human Decay Accelerating Factor. *Transplant Proc* 1994; 26/3:1400.
63. Schmoeckel M, Nollert G, Shahmohammadi M, et al. Prevention of hyperacute rejection by human decay accelerating factor in xenogeneic perfused working hearts. *Transplantation* 1996; 62: 729.
64. Storck M, Abendroth D, Prestel R, et al. Morphology of hDAF (CD55) transgenic pig kidneys following ex vivo hemoperfusion with human blood. *Transplantation* 1997; 63/2: 304.
65. Bach FH. Xenotransplantation: A view to the future. *Transplant Proc* 1993; 25/1: 25.
66. Schaapherder AFM, Gooszen HG, teBulte M-TJW, Daha MR. Human complement activation via the alternative pathway on porcine endothelium initiated by IgA antibodies. *Transplantation* 1995; 60/3: 287.
67. Kornberg A, Dietz O, Mau H, Pascher A, Stangl M, Scheele J, Hammer C. Impact of immunoadsorption on xenogeneic extracorporeal pig liver perfusion: assessment of organ function during autologous reperfusion. *Xenotransplantation* 1999; 6: 187-193.
68. Schuurman H, Pino-Chavez G, Phillips M, Thomas L, White D. Incidence of hyperacute rejection in pig-to primate transplantation using organs from hDAF-transgenic donors. *Transplantation* 2002; 15: 1146.
69. Cozzi E, Vial C, Ostlie D, Farah B, Chavez G, Smith KG, et al. Maintenance triple immunosuppression with cyclosporin A, mycophenolate sodium and steroids allows prolonged survival of primate recipients of hDAF porcine renal xenografts. *Xenotransplantation* 2003; 10: 300.

70. Higgins J, Lam T, Chavez G. Glomerular thrombotic microangiopathy in renal allografts from hDAF transgenic pigs into cynomolgus monkeys. *Xenotransplantation* 2001; 8(Suppl. 1): 44.
71. Pascher A, Sauer IM, Neuhaus P. Analysis of allogeneic versus xenogeneic auxiliary organ perfusion in liver failure reveals superior efficacy of human livers. *Int J Artif Organs* 2002. 25: 1006-12.
72. Hammer C. Xenotransplantation for liver therapy or: Can porcine hepatocytes generate physiological functions sufficient for a human patient in ALF? *Int J Artif Organs* 2002; 25(10): 1019-28.
73. Demetriou AA, Brown RS Jr, Busuttill RW, et al.. Prospective, randomized, multicenter, controlled trial of a bioartificial liver in treating acute liver failure. *Ann Surg* 2004; 239(5): 660-7.
74. van de Kerkhove MP, Hoekstra R, Chamuleau RA, van Gulik TM. Clinical application of bioartificial liver support systems. *Ann Surg* 2004;240(2): 216-30.
75. Starzl TE, Rowe MI, Todo S, et al. Transplantation of multiple abdominal viscera. *JAMA* 1989; 261: 1449-1457.
76. Deltz E, Schroeder P, Gebhardt H, et al. Successful clinical small bowel transplantation: Report of a case. *Clin Transplant* 1989; 3: 89-91.
77. Grant D, Wall W, Mimeault R, et al. Successful small-bowel / liver transplantation. *Lancet* 1990; 335: 181-184.
78. Margreiter R, Koenigsrainer A, Schmid T, et al. Successful multivisceral transplantation. *Transplant Proc* 1992; 24: 1226-1227.
79. Williams JW, Sankary HN, Foster PF, Loew JM, Goldman GM. Splanchnic transplantation. An approach to the infant dependent on parenteral nutrition who develops irreversible liver disease. *JAMA* 1989;261(10):1458-62.
80. Goulet O, Revillon Y, Brousse N, et al. Successful small bowel transplantation in an infant. *Transplantation* 1992; 53: 940-943.
81. Grant D. Intestinal transplantation: 1997 report of the International Registry. *Transplantation* 1999; 67: 1061-64.
82. Grant D, Abu-Elmagd K, Reyes J, Tzakis A, Langnas A, Fishbein T, Goulet O, Farmer D; on behalf of the Intestine Transplant Registry. 2003 report of the intestine transplant registry: a new era has dawned. *Ann Surg* 2005; 241(4): 607-13.
83. Pascher A, Radke C, Dignass A, Schulz R, Sauer IM, Platz KP, Klupp J, Neuhaus P, Mueller AR. Late Graft Loss After Intestinal Transplantation In An Adult Patient Due To Necrotizing Enterocolitis. *Am J Transplantation* 2003; 3(8): 1033-5 .
84. Welsh RM, Selin LK. No one is naive: the significance of heterologous T-cell immunity. *Nat Rev Immunol* 2002; 2: 417–426.

85. Adams AB, Williams MA, Jones TR, Shirasugi N, Durham MM, Kaech SM, Wherry EJ, Onami T, Lanier JG, Kokko KE, Pearson TC, Ahmed R, Larsen CP. Heterologous immunity provides a potent barrier to transplantation tolerance. *J Clin Invest* 2003; 111: 1887-1895.
86. Rocken M, Urban JF, Shevach EM. Infection breaks T-cell tolerance. *Nature* 1992; 359(6390): 79-82.
87. Ehl S, Hombach J, Aichele P, Rulicke T, Odermatt B, Hengartner H, Zinkernagel R, Pircher H. Viral and bacterial infections interfere with peripheral tolerance induction and activate CD8+ T cells to cause immunopathology. *J Exp Med* 1998; 187(5): 763-74.
88. Welsh RM, Markees TG, Woda BA, Daniels KA, Brehm MA, Mordes JP, Greiner DL, Rossini AA. Virus-induced abrogation of transplantation tolerance induced by donor-specific transfusion and anti-CD154 antibody. *J Virol* 2000; 74(5): 2210-18.
89. Williams MA, TM Onami, AB Adams, MM Durham, TC Pearson, R Ahmed, CP Larsen. Persistent viral infection prevents tolerance induction and escapes immune control following CD28/CD40 blockade-based regimen. *J Immunol* 2002; 169: 5387.
90. Turgeon NA, Iwakoshi NN, Phillips NE, Meyers WC, Welsh RM, Greiner DL, Mordes JP, Rossini AA. Viral infection abrogates CD8 (+) T-cell deletion induced by costimulation blockade. *J Surg Res* 2000; 93(1): 63-69.
91. Burrows SR, Khanna R, Burrows JM, Moss DJ. An alloresponse in humans is dominated by cytotoxic T lymphocytes (CTL) cross-reactive with a single Epstein-Barr virus CTL epitope: implications for graft-versus-host disease. *J Exp Med* 1994; 179: 1155-1161.
92. Beisser PS, Kloover JS, Grauls GE, Blok MJ, Bruggeman CA, Vink C. The r144 major histocompatibility complex class I-like gene of rat cytomegalovirus is dispensable for both acute and long-term infection in the immunocompromised host. *J Virol*. 2000; 74(2): 1045-50.
93. Cooper DK. Clinical xenotransplantation—how close are we? *Lancet* 2003; 362: 557.
94. Tseng A, Kuwaki K, Dor F, Shimizu A, Houser S, Sanderson T, et al. Transplantation of hearts from alpha1,3-galactosyl-transferase gene-knockout pigs into baboons. *Transplantation* 2004; 4(Suppl. 8): 450.
95. Ramsoondar JJ, Machaty Z, Costa C, Williams BL, Fodor WL, Bondioli KR. Production of alpha 1,3-galactosyltransferase-knockout cloned pigs expressing human alpha 1,2-fucosyltransferase. *Biol Reprod* 2003; 69: 437.
96. Levy MF, Crippin J, Sutton S, et al.. Liver allotransplantation after extracorporeal hepatic support with transgenic (hCD55/hCD59) porcine livers- Clinical results and lack of pig-to-human transmission of the porcine endogenous retrovirus. *Transplantation*, 2000; 69/2: 272.
97. Platt JL. Xenotransplantation of the liver: Is more complement control needed? *Liver Transpl* 2001; 7:
98. Platt JL. The humoral barrier to transplantation of the liver: It is more real than apparent? *Liver Transpl* 2001; 7: 90-92.

99. Ramirez P, Yelamos J, Parilla P, Chavez R. Hepatic xenotransplantation will benefit from strategies aimed to reduce complement activation. *Liver Transpl* 2001; 7: 562-563.
100. Chiche L, Adam R, Caillat-Zucman S, Castaing D, Bach JF, Bismuth H. Xenotransplantation: baboons as potential liver donors? *Transplantation* 1993; 55: 1418-1421.
101. Patience C, Takeuchi Y, Weiss RA. Infection of human cells by an endogenous retrovirus of pigs. *Nature Med* 1997; 3: 282-286.
102. Tissier PI, Stoye JP, Takeuchi Y, Patience C, Weiss RA. Two sets of human-tropic pig retrovirus. *Nature* 1997; 389: 681-682.
103. Martin U, Steinhoff G, Kiessig V, Chikobava M, Anssar M, Morschheuser T, et al. Porcine endogenous retrovirus is transmitted neither in vivo nor in vitro from porcine endothelial cells to baboons. *Transpl Proc* 1999; 31: 913-914.
104. Irgang M, Sauer IM, Karlas A, Zeilinger K, Gerlach JC, Kurth R, Neuhaus P, Denner J. Porcine endogenous retroviruses: no infection in patients treated with a bioreactor based on porcine liver cells. *J Clin Virol*. 2003;28(2):141-54.
105. Michaels MG, Jenkins FJ, St. George K, Nalesnik MA, Starzl TE, Rinaldo Jr. CR. Detection of infectious baboon cytomegalovirus after baboon-to-human liver xenotransplantation. *J Virol* 2001; 75: 2825-2828.
106. Starzl TE, Fung J, Tzakis A, Todo S, Demetris AJ, Marino IR, et al.. Baboon-to-human liver transplantation. *Lancet* 1993; 341: 65-71.
107. Gollackner B, Mueller NJ, Houser S, et al.. Porcine cytomegalovirus and coagulopathy in pig-to-primate xenotransplantation. *Transplantation* 2003; 15;75(11):1841-7.
108. Pascher A, Klupp J. Biologics in the Treatment of Transplant Rejection and Ischemia / Reperfusion Injury: New Applications for TNF Inhibitors? *Bio Drugs* 2005, 19/4: 211-231.
109. Fishbein TM. The current state of intestinal transplantation. *Transplantation* 2004; 78(2): 175-8.
110. Hering BJ, Kandaswamy R, Ansite JD, et al. Single-donor, marginal-dose islet transplantation in patients with type 1 diabetes. *JAMA* 2005; 293(7): 830-5.
111. Neuhaus P, Pascher A. How successful is intestinal transplantation and what improves graft survival? *Nature Clin Pract Gast Hep* 2005; 2/7: 206-207.