

Dr. Valentin Grabovsky

List of Publications during the years of his work at the Weizmann Institute (1998-2010)

Refereed articles:

1. Peled, A., **Grabovsky, V.**, Petit I., Ben-Hur, H., Lapidot, T. and Alon, R. (1999) The chemokine SDF-1 stimulates integrin-mediated arrest of immature human CD34+ cells on vascular endothelium under shear flow. *J. Clin. Invest.* 104, 1199-1211.
2. Peled A., Kollet, O., Ponomaryov, T., Petit, I., Franitza, S, **Grabovsky, V.**, Slav, M.M., Nagler, A, Lider, O., Alon, R., Zipori, D. and Lapidot T. (2000) The chemokine SDF-1 activates the integrins LFA-1, VLA-4 and VLA-5 on immature human CD34+ cells: role in transendothelial/stromal migration and engraftment of NOD/SCID mice. *Blood* 95, 3289-3296.
3. Sigal, A. Bleijs, D.A., **Grabovsky, V.**, van Vliet, S.J., Dwir, O., Figdor, C.G., Van Kooyk, Y. and Alon, R. (2000) The LFA-1 integrin supports rolling adhesions on ICAM-1 under physiological shear flow in a permissive cellular environment. *J. Immunol.* 165, 442-452.
4. **Grabovsky, V.**, Feigelson, S., Chen, C., Bleijs, D.A., Peled, A., Cinnamon, G., Baleux, F., Arenzana-Seisdedos, F., Lapidot, T., Van Kooyk, Y. Lobb, R. and Alon, R. (2000) Sub-second induction of $\alpha 4$ integrin clustering by immobilized chemokines stimulates leukocyte tethering and rolling on endothelial VCAM-1 under flow conditions. *J. Exp. Med.* 192, 495-506.
5. Geijtenbeek, T.B.H., Krooshoop, D.J., Bleijs, D.A., van Vliet, S.J., van Duijnhoven G.C.F., **Grabovsky, V.**, Alon, R. Figdor, C.G. and Van Kooyk, Y. (2000) DC-SIGN, a novel receptor for endothelial ICAM-2, regulates trafficking of dendritic cells through rolling interactions. *Nature Immunol.* 4, 353-357.
6. Farber-Elmann, A., Dayan, M., **Grabovsky, V.**, Sela, M., Alon, R. and Mozes, E. (2000) Cytokine profile and T cell adhesiveness to endothelial selectins: In vivo induction by a myasthenogenic T cell epitope and immunomodulation by a dual altered peptide ligand. *Internat. Immunol.* 12, 1561-1658.
7. Farber-Elmann, A., **Grabovsky, V.**, Dayan, M., Sela, M., Alon, R. and Mozes, E. (2001) An altered peptide ligand inhibits the activities of matrix metalloproteinase-9 and phospholipase C, and inhibits T cell interactions with VCAM-1, induced in vivo by a myasthenogenic T cell epitope. *FASEB J.* 15, 187-194.
8. Feigelson, S., **Grabovsky, V.** Winter, E., Pepinsky, B., Lobb, R. and Alon, R. (2001) The Src kinase p56^{lck} upregulates VLA-4 affinity: Implications for rapid spontaneous and chemokine-triggered T cell adhesion to VCAM-1 and fibronectin. *J. Biol. Chem.* 276, 13891-13901.
9. Wallach-Dayana, S.B., Golan, I., **Grabovsky, V.**, Moll, J., Sleeman, J., Herrlich, P., Alon, R. and Naor, D. (2001) CD44-dependent lymphoma cell dissemination: A cell surface CD44 variant, rather than standard CD44, supports in vitro lymphoma cell rolling on hyaluronic acid substrate and its in vivo accumulation in the peripheral lymph nodes. *J. Cell. Sci.* 114, 3463-3477.
10. Rose, D.M., **Grabovsky, V.**, Alon, R. and Ginsberg, M.H. (2001) The affinity of integrin $\alpha 4\beta 1$ governs lymphocyte migration. *J. Immunol.* 167, 2824-2830.

11. Peled, A., Hardany, I., Trakhtenbroty, L., Magid, M., Darash-Yahana, M., Coheny, N., **Grabovsky, V.**, Franitza, S., Kollet, O., Lider, O., Alon, R., Rechavi, G. and Lapidot, T. (2002). Immature leukemic CD34+CXCR4+ cells from CML patients have reduced integrin-dependent migration and adhesion in response to the chemokine SDF-1. *Stem Cells* 20, 259-266.
12. **Grabovsky, V.** Dwir, O. and Alon, R. (2002) Endothelial chemokines destabilize L-selectin-mediated lymphocyte rolling without inducing selectin shedding. *J. Biol. Chem.* 277, 20640-20650.
13. Shamri, R., **Grabovsky, V.**, Feigelson, S. van Kooyk, Y. and Alon, R. (2002) Chemokine-stimulation of lymphocyte α_4 integrin avidity but not of LFA-1 avidity to endothelial ligands under shear flow requires cholesterol membrane rafts. *J. Biol. Chem.* 277, 40027-40035.
14. Alon, R., Aker, M., Feigelson, S., Sokolovsky-Eisenberg, M., Staunton, D.E., Cinamon, G., **Grabovsky, V.**, Shamri, R. and Etzioni, A. (2003) A novel genetic leukocyte adhesion deficiency in subsecond triggering of integrin avidity by endothelial chemokines results in impaired leukocyte arrest on vascular endothelium under shear flow. *Blood* 101, 4437-4445.
15. Feigelson, S., **Grabovsky, V.**, Shamri, R., Levy, S. and Alon, R. (2003) The CD81 tetraspanin facilitates instantaneous VLA-4 rearrangements promoting leukocyte adhesion to VCAM-1 under shear flow. *J. Biol. Chem.* 278, 51203-51212.
16. Kinashi, T., Aker, M., Sokolovsky-Eisenberg, M., **Grabovsky, V.**, Tanaka, C., Shamri, R., Feigelson, S., Etzioni, A. and Alon, R. (2004) LAD-III, a leukocyte adhesion deficiency syndrome associated with defective Rap1 activation and impaired stabilization of integrin bonds. *Blood*, 103, 1033-1036.
17. Sotnikov, I., Hershkoviz, R., **Grabovsky, V.**, Ilan, N., Cahalon, L., Vlodavsky, I., Alon, R. and Lider, O. (2004) Enzymatically quiescent heparanase augments T cell interactions with VCAM-1 and extracellular matrix components under versatile dynamic contexts. *J. Immunol.*, 172, 5185-5193.
18. Franitza, S., **Grabovsky, V.**, Wald, O., Weiss, I., Beider, K., Dagan, M., Darash-Yahana, M., Nagler, A., Brocke, S., Galun, E., Alon, R. and Peled, A. (2004) Differential usage of VLA-4 and CXCR4 by CD3+CD56+NKT cells and CD56+CD16+NK cells regulates their interaction with endothelial cells. *Eur. J. Immunol.* 34, 1333-1341.
19. Shamri, R., **Grabovsky, V.**, Gauguet, J.M., Feigelson, S., Manevich, E., Kolanus, W., Robinson, M.K., Staunton, D.E., von-Andrian, U.H. and Alon, R. (2005) Lymphocyte arrest on endothelial ICAM-1 requires a subsecond induction of an extended LFA-1 conformation by an endothelial-bound chemokine signal. *Nature Immunol.* 6, 497-506.
20. Alon, R., Feigelson, S., Manevich, E., Rose, D.M., Schmitz, J., Overby, D.R., Winter, E., **Grabovsky, V.**, Shinder, V., Matthews, B.D., Sokolovsky-Eisenberg, M., Ingber, D.E., Benoit, M. and Ginsberg, M.H. (2005) $\alpha_4\beta_1$ -dependent adhesion strengthening under mechanical strain is regulated by paxillin association with the α_4 cytoplasmic domain *J. Cell. Biol.* 171, 1073-1084.
21. Dagan-Berger, M., Feniger-Barish, R., Avniel, S., Wald, H., Galun, E., **Grabovsky, V.**, Alon, R., Nagler, A., Ben-Baruch, A. and Peled, A. (2006) Role of CXCR3 carboxyl-terminus and third intracellular loop in receptor-mediated migration, adhesion and internalization in response to CXCL11. *Blood* 107, 3821-3831.
22. Shulman, Z. Pasvolsky, R., Woolf, E., **Grabovsky, V.**, Feigelson, S.W., Erez, N., Fukui, Y. and Alon, R. (2006) DOCK2 regulates chemokine-triggered lateral lymphocyte motility but not transendothelial migration. *Blood* 108, 2150-2158.

23. Pasvolsky, R., Feigelson, S.W., Kilic, S.S., Simon, A.J., Tal-Lapidot, G., **Grabovsky, V.**, Crittenden, J.R., Amariglio, N., Safran, M., Graybiel, A.M., Rechavi, G., Ben-Dor, S., Etzioni, A. and Alon, R. (2007) A LAD-III syndrome is associated with defective expression of the Rap-1 activator CalDAG-GEFI in lymphocytes, neutrophils, and platelets. *J. Exp. Med.* 204, 1571-1582.
24. Dwir, O., **Grabovsky, V.**, Pasvolsky, R., Manevich, E., Shamri, R., Gutwein, P., Feigelson, S.W., Altevogt, P. and Alon, R. (2007) Membranal cholesterol is not required for L-selectin adhesiveness in primary lymphocytes but controls a chemokine-induced destabilization of L-selectin rolling adhesions. *J. Immunol.* 179, 1030-1038.
25. Woolf, E., Grigorova, I., Sagiv, A., **Grabovsky, V.**, Feigelson, S.W., Shulman, Z., Hartmann, T., Sixt, M., Cyster J.C. and Alon, R. (2007) Immobilized lymph node chemokines promote sustained T lymphocyte motility but fail to trigger stable integrin adhesiveness in the absence of shear forces. *Nature Immunol.* 8, 1076-1085.
26. Manevich, E., **Grabovsky, V.**, Feigelson, S.W. and Alon, R. (2007) Talin1 and paxillin facilitate distinct steps in rapid VLA-4-mediated adhesion strengthening to VCAM-1. *J. Biol. Chem.* 282, 25338-25348.
27. Pasvolsky, R., **Grabovsky, V.**, Giagulli, C., Shulman, Z., Shamri, R., Feigelson, S.W., Laudanna, C. and Alon, R. (2008) RhoA is involved in LFA-1 extension triggered by CXCL12 but not in a novel outside-in LFA-1 activation facilitated by CXCL9. *J. Immunol.* 180, 2815-2823.
28. Hartmann, T.N., **Grabovsky, V.**, Pasvolsky, R., Shulman, Z., Buss, E.C., Spiegel, A., Nagler, A., Lapidot, T., Thelen, M., Alon, R. (2008) A crosstalk between intracellular CXCR7 and CXCR4 involved in rapid CXCL12-triggered integrin activation but not in chemokine-triggered motility of human T lymphocytes and CD34+ cells. *J. Leukoc Biol.* 84, 1130-1140.
29. Flaishon, L., Hart, G., Zelman, E., Moussion, C., **Grabovsky, V.**, Lapidot Tal, G., Feigelson, S.W., Margalit, R., Harmelin, A., Avin-Wittenberg, T., Shoseyov, D., Alon, R., Girard, J.P., Shachar, I. (2008) Anti-inflammatory effects of an inflammatory chemokine: CCL2 inhibits lymphocyte homing by modulation of CCL21 triggered integrin-mediated adhesions. *Blood* 112,5016-5025.
30. Shulman, Z., Shinder, V., Klein, E., **Grabovsky, V.**, Yeger, X., Geron, E., Montresor, A., Bolomini-Vittoi, M., Feigelson, S.W., Kirchhausen, T., Laudanna, C., Shakhar, G. Alon, R. (2009) Lymphocyte crawling on and through activated endothelium is mediated by millipede-like contacts generated by chemokine triggered high affinity LFA-1 primed by shear forces. *Immunity* 30, 384-396.
31. Hartmann, T.N, **Grabovsky, V.**, Wang, W., Desch, P., Wollner, S., Binsky, I., Vallon-Eberhard, A., Sapoznikow, A, Haran, M., Shachar, I., Burger, M., Honczarenko, M., Greil, R., Alon, R. (2009) Circulating B-cell chronic lymphocytic leukemia cells display impaired migration to lymph nodes and bone marrow. *Cancer Res.* 69, 3121-3130.
32. Molteni, R., Crespo, L.C., Feigelson, S., Moser, C., Fabbri, M., **Grabovsky, V.**, Krombach, F., Laudanna, C., Alon, R., Pardi, R. (2009) β -arrestin 2 is required for the induction and strengthening of intergrin-mediated leukocyte adhesion during CXCR2-driven extravasation. *Blood*, 114, 1073-82.
33. Manevich-Mendelson, E., Feigelson, S.W., Pasvolsky, R, Aker, M., **Grabovsky, V.**, Shulman, Z., Kilic, S.S, Rosenthal-Allieri, M.A., Ben-Dor, S., Mory, A., Bernard, A., Moser, M., Etzioni, A., and Alon, R. (2009) Loss of Kindlin-3 in LAD-III eliminates LFA-1 but not VLA-4 adhesiveness developed under shear flow conditions. *Blood*, 114, 2344-2353.

34. Binsky, I. Lantner, F., **Grabovsky, V.**, Harpaz, N., Shvidel, L., Berrebi, A., Goldenberg, D.M., Leng, L., Bucala, R., Alon, R. Haran, M., and Shachr, I. (2010) TAp63 regulates VLA-4 expression and CLL cell migration to the BM in a CD74 dependent manner. *J. Immunol.*, 184, 4761-9.
35. Manevich-Mendelson, E., **Grabovsky, V.**, Feigelson, S.W., Cinamon, G., Gore, Y., Goverse, G., Monkley, S.J., Margalit, R., Melamed, D., Mebius, R.E., Critchley, D.R., Shachar, I., Alon, R. (2010) Talin1 is required for integrin-dependent B lymphocyte homing to lymph nodes and the bone marrow but not for follicular B cell maturation in the spleen. *Blood*. In press.
36. Feigelson, S.W., Pasvolsky, R., Cemerski, S., Shulman, Z., **Grabovsky, V.**, Ilani, T., Sagiv, A., Lemaitre, F., Laudanna, C., Shaw, A.S., Alon, R. Occupancy of lymphocyte LFA-1 by surface-immobilized ICAM-1 is critical for TCR- but not for chemokine-triggered LFA-1 conversion to an open headpiece high-affinity state. *J. Immunol.* In press.

Invited reviews:

37. Cinamon, G., **Grabovsky, V.**, Winter, E., Franitza, S., Feigelson, S., Shamri, R., Dwir O. and Alon, R. (2001) Novel functions of apically-displayed endothelial chemokines in lymphocyte adhesion and migration through vascular endothelium under shear flow. *J. Leuk. Biol.* 69, 860-866.
38. Alon, R. **Grabovsky, V.**, and Feigelson, S. (2003) Chemokine Induction of Integrin Avidity on Rolling Leukocytes: Local Signaling or Global Stepwise Activation? *Microcirculation* 10, 297-311.

Book chapters:

39. Alon, R., Dwir, O. and **Grabovsky, V.** (2003) Selectin avidity modulation by chemokines at subsecond endothelial contacts: a novel regulatory level of leukocyte trafficking, in: "Leukocyte Trafficking: Role of Fucosyltransferases and Selectins" Ernst Schering Research Foundation Workshop, (Arndt Schottelius, ed.), Springer-Verlag Berlin-Heidelberg.

Submitted manuscripts:

40. Shulman, Z., **Grabovsky, V.**, Cohen, S.J., Klein, E., Shinder, V., Feigelson, S.W., Goldstein, I., Hartley, O., Etzioni, A., Ben-Baruch, A., and Alon, R. Transendothelial migration of effector lymphocytes involves integrin-dependent consumption of vesicle-stored endothelial chemokines rather than extracellular gradients