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RESUME

DR. GERA NEUFELD

ID. No.: 30553580
Birth: Israel, March 21, 1950
Military service: 1968-1971 in the IDF.
Status: Married, three children
Work: Cancer and Vascular Biology Research Center,
Faculty of Medicine, Technion, Israel Institute of Technology,
P.O. Box 9697, 1 Efron St., Haifa, 31096,
ISRAEL

ACADEMIC DEGREES

<u>Degree</u>	<u>Year</u>	<u>Department</u>	<u>Institute</u>
Ph.D.	1985	Biochemistry,	The Hebrew University of Jerusalem
B. Pharm.	1984	Pharmacy,	The Hebrew University of Jerusalem. Pharmacy License No. 03357
M.Sc	1977	Pharmacology	The Hebrew University of Jerusalem.
B.Sc.	1974	Chemistry,	The Hebrew University of Jerusalem.

ACADEMIC APPOINTMENTS

2018-present Professor Emeritus, Cancer Research and vascular Biology Center, Faculty of medicine, Technion, Israel Institute of Technology, Haifa, Israel.

2002-2018 Professor, Cancer Research and vascular Biology Center, Faculty of medicine, Technion, Israel Institute of Technology, Haifa, Israel.

2001-Present The Seymour and Claire Schonwetter Chair in Life Sciences.

2000-2002 Dean, Department of Biology, Technion, Israel Institute of Technology, Haifa, Israel.

1999-2002 Professor, Department of Biology, Technion, Israel Institute of Technology, Haifa, Israel.

1994-1999 Associate Professor, Department of Biology, Technion, Israel Institute of Technology, Haifa, Israel.

1992-1993: Senior lecturer (with tenure), Department of Biology, Technion, Israel Institute of Technology, Haifa, Israel.

1987-1992: Senior lecturer, Department of Biology, Technion, Israel Institute of Technology, Haifa, Israel.

1984-1987: Postdoctoral fellow in the laboratory of Prof. Denis Gospodarowicz at the Cancer Research Institute, University of California at San-Francisco.

1979-1983: Instructor In the department of Biological Chemistry, The Hebrew University of Jerusalem.

PROFESSIONAL EXPERIENCE

- 2003-present Professor at the Cancer and Vascular Biology research Center, Faculty of Medicine, Technion.
- 2000-2002 Dean, Department of Biology, Technion, Israel Institute of Technology, Haifa, Israel.
- 1999-Present Professor, Department of Biology, Technion, Israel Institute of Technology, Haifa, Israel. Main Subjects of research: The biology of the neuropilin receptors of Vascular Endothelial Growth Factor and the anti-angiogenic mechanism of action of platelet factor 4.
- 1994-1999 Associate Professor, Department of Biology, Technion, Israel Institute of Technology, Haifa, Israel. Main Subjects: The biology of Vascular Endothelial Growth Factor.
- 1996-1997 Visiting Scientist. National Institutes of Health (sabbatical in the laboratory of Dr. Hynda Kleinman). Research subjects: Identification of genes that are down regulated by vascular endothelial growth factor.
- 1987-1994 Senior Lecturer, Research at the Department of Biology, Technion. Main Subjects: The biology of basic Fibroblast Growth Factor and Vascular Endothelial Growth Factor.
- 1984-1987 Post doctoral fellow at the university of California Medical Center at San-Francisco. Subject: "The biology of Acidic and Basic Fibroblast Growth Factors". With Prof. Denis Gospodarowicz.
- 1979-1984 Instructor. Hebrew University of Jerusalem. Research on signal transduction by G protein coupled receptors.
- 1974-1977 M.Sc. Studies in the Hebrew University of Jerusalem. Subject: "Characterization of Ouabain binding sites in the rat kidney". Under the supervision of Prof. Yehuda Gutman.

RESEARCH INTERESTS

The laboratory of Prof. Neufeld investigates molecular mechanisms that contribute to the development and progression of cancer. Specifically, the laboratory focuses on molecular mechanisms that control the growth of new blood vessels into tumors (tumor angiogenesis). Fifteen years ago we studied the major angiogenesis promoting protein, VEGF. From the single gene encoding VEGF are produced several alternatively spliced forms of VEGF. We hypothesized that there may exist receptors that will only recognize specific forms of VEGF. We have identified such receptors and they turned out to be neuropilins, receptors that were previously known to be receptors for axon guidance factors of the semaphorin family. These findings lead to the identification of some semaphorins as anti-angiogenic and anti-tumorigenic factors. In addition, work from the laboratory also identified a member of the lysyl-oxidase gene family, Loxl2, as an enzyme that plays an important role in the regulation of tumor metastasis. We are currently investigating the molecular mechanisms used by Loxl2

to promote tumor metastasis and on the characterization of genes whose expression is up or down regulated in tumorigenic cells that over-express Loxl2. A drug targeting LOXL2 that is based upon these findings is now in clinical trials.

TEACHING EXPERIENCE

<u>Title of course</u>	<u>level</u>
Cell Biology 1	Second year undergraduates
Cell Biology 2	Third year undergraduates and graduate students
Biochemistry	Second year undergraduates
Molecular Basis of Cancer	Graduate students
Receptors and signaling	Graduate students
Biology for engineers	Undergraduate students.
From Cell to Tissue	Biomedical engineering undergraduates
Tumor progression	Graduate students, Medicine

PUBLIC PROFESSIONAL ACTIVITIES

1993-1995 Member in a committee on cell biology, Basic research foundation, Israel Academy of Sciences.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Israel Society of Biochemistry

Israel Society of Cell Biology

Israel Society of Developmental Biology

American Society of biochemistry and molecular biology (ASBMB)

HONORS

1984 Fullbright Fellowship

1987 Alon Fellowship

1996 International Union Against Cancer Fellowship

2007 Herchel Rich Innovation Award for the discovery of the role of LOXL2 in tumor progression.

2010 Herchel Rich Innovation Award for the discovery of the role of plexin-A4 in tumor progression.

GRADUATE STUDENTS

COMPLETED THESES

<u>Year of Graduation</u>	<u>Name</u>	<u>Additional Supervisors</u>
1990	Shoshana Tessler, M.Sc.,	
1990	Nora Vaisman, M.Sc.	
1992	David Peretz, Ph.D.	
1992	Shay Soker, Ph.D	
1992	Ena Chernin, M.Sc.	
1992	Tzafra Cohen, M.Sc.	Prof. Ben-Zion Levi
1993	Michal Ychezkeli, M.Sc.	
1993	Stela Gangranovitz, M.Sc.	
1994	Dan Goldstaub, M.Sc.	
1995	Shoshana Tessler, Ph.D.	
1995	Amir Comforti, M.Sc.	
1995	Tali Horvat, M.Sc.	Prof. Gadi Spira
1996	Zoya Poltarek, M.Sc.	
1997	Tzafra Cohen, Ph.D.	Prof. Ben-Zion Levi
1998	Michal Migdal, Ph.D.	
1998	Stela Gangranovitz, Ph.D.	
2000	Zoya Poltorak, Ph.D.	
2000	Yulian Ostrovski, M. Sc.	
2002	Tali Lange, M. Sc.	
2002	Niva Shraga, M. Sc.	
2003	Zehava Vadas, M.D., Ph.D.	
2003	Gal Akiri, Ph.D.	
2005	Yael Herzog, Ph.D.	
2006	Sharon Swaid, M.Sc.	
2006	Adi Aladgem, M.Sc.	
2006	Niva Shraga, Ph.D.	
2007	Asia Vershavsky M.D./Ph.D.	
2007	Tali Lange, Ph.D.	
2007	Vera Breckman, Ph.D.	
2008	Roni Zidon, M.Sc.	
2011	Boaz Kigel, Ph.D.	
2012	Noa Uziel, Ph.D.	
2012	Adi Sabag, Ph.D.	
2012	Dorit Fink, Ph.D.	
2013	Shelly Eilot Ph.D.	
2014	Noa Ezaguy, M.Sc.	
2016	Yelena Mumblat Ph.D.	
2017	Tanya Smolkin, Ph.D..	
2018	Shira Toledano, Ph.D.	Dr. Yoreh Barak
2019	Inbal Nir-Zvi, Ph.D.	

RESEARCH GRANTS OF DR. GERA NEUFELD

- 1) 1988-1991 Grant from the United States - Israel Binational Science Foundation. (100,000 \$)
- 2) 1988-1991 Grant from the Israel Academy of Sciences and Humanities. (30,000 \$)
- 3) 1988-1990 Grant from the Israel Cancer Research Fund. (30,000 \$)
- 4) 1988-1990 Grant from the Israel Cancer Research Association. (24,000 \$)
- 5) 1989-1992 Research and consultation Contract with Sterling Drugs Inc. (A subsidiary of the Eastman-Kodak Corporation). (182,000 \$)
- 6) 1991-1994 Grant from the Tobacco Research Council (U.S.A.) (120,000 \$)
- 7) 1991-1994 Grant from the United States - Israel Binational Science Foundation. (100,000 \$)
- 8) 1991-1993 Grant from the Israel Cancer Research Fund. (36,000 \$)
- 9) 1991-1993 Grant from the Israel Ministry of Health. (17,000 \$)
- 10) 1991 Grant from VATAT for equipment (32,000 \$)
- 11) 1992-1995 Grant from the Israel Ministry of Science and Technology, Joint program with Germany (300,000 DM) (Together with Drs. B. Miller and H. Miller from the Technion School of Medicine.)
- 12) 1992 Grant from the Minerva foundation (with Dr. Ben-Zion Levi) (40,000 DM)
- 13) 1993-1996 Grant from the Israel Ministry of Science and Technology, Joint program with Germany (240,000 DM)
- 14) 1993-1995 Grant from the Israel Cancer Research Fund. (30,000 \$)
- 15) 1995-1998 Grant from the Israel - Germany binational foundation (GIF) (300,000 DM)
- 16) 1994-1997 Grant from the Israel Academy of Sciences and Humanities (150,000 \$)
- 17) 1995-1998 Grant from the Israel Academy of Sciences and Humanities (Research center on angiogenesis in collaboration with: Drs. Dina Ron, Eli Keshet, and Israel Vlodavsky) (750,000 \$)
- 18) 1996-1998 Grant from the Ministry of Health (40,000 NIS)
- 19) 1996-1998 Grant from the Israel Cancer Research Fund. (36,000 \$)
- 20) 1997-1998 Grant from the Israel Academy of Sciences and Humanities (Continuation of research center on angiogenesis in collaboration with: Drs. Dina Ron, Eli Keshet, and Israel Vlodavsky) (200,000 \$)
- 21) 1998-2001 Grant from the Israel Academy of Sciences and Humanities entitled: "characterization of novel VEGF and platelet factor-4 (PF4) receptors in endothelial cells, and examination of their role in cellular signaling" (180,000 \$)
- 22) 1998-2000 Grant from the Israel Cancer Research Fund entitled: Characterization of novel VEGF and platelet factor-4 receptors. (36,000 \$)
- 23) 1999 Grant from "Keren Izvonot" 3600 \$

- 24) 2000-2003 Grant from the German-Israeli binational Fund (GIF) entitled: A novel anti-angiogenic factor from neuroblastoma and a novel receptor for the anti-angiogenic protein platelet factor-4: Characterization and role in tumor angiogenesis. (300,000 DM)
- 25) 2000-2002 Grant from the Israel Cancer Research Fund entitled: Characterization of novel platelet factor-4 receptors and their role in tumor progression. (60,000 \$)
- 26) 2000-2002 Grant from Collateral Therapeutics (150,000 \$).
- 27) 2001 Grant from the Israel Cancer Society entitled "The role of semaphorins in tumor angiogenesis" (10,000 \$).
- 28) 2001-2004 Grant from the Israel Academy of Sciences and Humanities entitled: "The role of class-3 semaphorins in vascular biology and angiogenesis" (197,000 \$)
- 29) 2002-2005 Grant from ministry of science, joint program with Germany (DKFZ) entitled: "The role of semaphorins and neuropilins in tumor development" (120,000 Euro)
- 30) 2003-2004 Grant from the Israel Cancer Society entitled "The role of lysyl-oxidase related protein-1 in the progression of breast cancer" (10,000 \$).
- 31) 2003 Grant from Collateral Therapeutics (50,000 \$).
- 32) 2004-2007 Grant from the German-Israeli binational Fund (GIF) entitled: The role of the neuropilins in vasculogenesis, vascular differentiation, lymphangiogenesis, and tumor development (204,000 Euro).
- 33) 2004 Grant from CapCure entitled: The role of the semaphorins and their neuropilin receptors in the regulation of prostate cancer development. (50,000 \$).
- 34) 2004-2007 Grant from the US-army (congressionally directed medical research programs (CDMRP) entitled: "The role of the lysyl-oxidases as inducers of desmoplasia and tumor invasion in breast cancer" (340,000 \$)
- 35) 2004-2008 Grant from the Israel Academy of Sciences and Humanities entitled: The molecular mechanisms by which class-3 Semaphorins regulate tumor angiogenesis and tumor progression. (1,180,000 NIS).
- 36) 2005-2008 Grant from the AICR entitled: Characterization of the anti-angiogenic properties of class-3 semaphorins and characterization of their mechanism of action. (104,000 £)
- 37) 2006-2009 Grant from the Susan Komen breast cancer foundation entitled: "Inhibition of breast cancer tumor progression by class-3 semaphorins". (250,000 \$)
- 38) 2006-2007 Grant from NOFAR: Early detection of colon cancer. (87,000\$)
- 39) 2006-2009 Grant from the center for complexity science (with Prof. Alfred Bruckstein): "Development of methods combining time-lapse

- photography with computerized image analysis for the study of angiogenesis" (100,000 \$).
- 40) 2007-2011 Grant from the McDonnell Foundation entitled "The effects of class-3 semaphorins on the development and progression of brain tumors." (350,000 \$)
- 41) 2007-2010 Grant from Arresto Inc. entitled "Characterization of the mechanisms used by Loxl2 to promote tumor progression" (360,000 \$)
- 42) 2007-2009 Grant from the ICRF entitled: "Inhibition of VEGF induced tumor angiogenesis by disruption of neuropilin/VEGFR-2 complex formation" (60,000 \$).
- 43) 2008-2010 Grant from the Neidersachsen foundation entitled "Examination of the effects of class-3 semaphorins on the development and progression of brain tumors" (100,000 Euro/yr)
- 44) 2008-2011 Grant from the ISF "Characterization of signaling pathways used by class-3 semaphorins to affect the behavior of endothelial cells and cancer cells." (525,000 NIS).
- 45) 2009-2012 Grant from ministry of science, joint program with Germany (DKFZ) entitled: "Modulation of the anti-tumorigenic and anti-angiogenic activity of class-3 semaphorins by the NrCAM adhesion receptor and by components of the Notch pathway" (39,000 Euro/yr)
- 46) 2010-2012 Grant from the ICRF entitled: " Characterization of the mechanisms by which RAMP3 mediates Loxl2 induced tumor progression " (60,000 \$)
- 47) 2012-2016 Grant from the ISF "The role of specific plexins and their associated receptors as mediators of class 3 and class-6 semaphorin signalling in angiogenesis and tumor progression." (856,000 NIS).
- 48) 2012-2014 Kamin grant on: "Use of point-mutated, furin cleavage resistant semaphorin-3E for the treatment of cancer and additional angiogenic diseases." (600,000 NIS)
- 49) 2011-2015 Grant from the Rappaport Institute for Medical Sciences on "Semaphorin guidance factors and their neuropilin and plexin receptors in health and disease" (120,000 \$)
- 50) 2014-2016 Kamin grant on: "Use of the anti-lymphangiogenic agent semaphorin-3C for the treatment of lymphangiogenic eye diseases and tumor metastasis" (300,000 NIS)
- 51) 2014-2016 ICRF grant on: "Elucidation of enzyme activity dependent and enzyme activity independent mechanisms by which lysyl-oxidases promote tumor progression" (60,000 \$)
- 52) 2014-2017 ISF-China collaboration grant on: "Elucidation of the molecular mechanisms by which lysyl-oxidase like-2 (loxl2) enhances angiogenesis and tumor metastasis" (1,050,000 NIS)
- 53) 2015-2018 Grant from the Rappaport Institute on: "The role of semaphorin fragments produced by cleavage with furin like pro-protein convertases in tumor progression" (150,000 \$)

- 54) 2016-2020 Grant from the ISF: “Characterization of mechanisms used by class-3 semaphorins to modulate tumor progression” (1,520,000 NIS/ 4 years)
- 55) 2016-2017 Grant from the Israel Cancer Society (ICA): The role of semaphorin-3A (sema3A) in the development of multiple myeloma. (75,000 NIS).
- 56) 2016-2018 Collaboration with Shantou University Grant: The role of non-secreted, enzymatically inactive isoforms of LOXL2 in tumor progression” (100,000 \$).

PUBLICATIONS

Full list of publications also at:

<https://www.ncbi.nlm.nih.gov/myncbi/gera.neufeld.1/bibliography/public/>

A. *Theses*

Transplantation of a beta-adrenergic receptor into an adenylate cyclase system of another cell. Hebrew University of Jerusalem, June 1984.

B. *Refereed Papers in professional Journals*

1. Eimerl, S., Neufeld, G., Korner, M. and Schramm, M. (1980) Functional implantation of a solubilized beta-adrenergic receptor in the membrane of another cell. *Proc. Natl. Acad. Sci. USA.* **77**, 760-764
2. Neufeld, G., Schramm, M., and Weinberg, N. (1980) Hybridization of adenylate cyclase components by membrane fusion and the effect of selective digestion by trypsin. *J. Biol. Chem.* **255**, 9268-9274
3. Neufeld, G., Steiner, S., Korner, M. and Schramm, M. (1983) Trapping of the beta-adrenergic receptor in the hormone induced state. *Proc. Natl. Acad. Sci. USA.* **80**, 6441-6445
4. Neufeld, G., and Gospodarowicz, D. (1985) The identification and partial characterization of the fibroblast growth factor receptor of baby hamster kidney cells. *J. Biol. Chem.* **261**, 13860-13868
5. Neufeld, G., Massoglia, S. and Gospodarowicz, D. (1986) Effect of lipoproteins and growth factors on the proliferation of BHK-21 cells in serum free culture. *Regulatory Peptides* **13**, 293-305
6. Neufeld, G., and Gospodarowicz, D. (1986) Basic and acidic fibroblast growth factors interact with the same cell surface receptors. *J. Biol. Chem.* **261**, 5631-5637
7. Neufeld, G., Gospodarowicz, D., Dodge, L. and Fujii, D. K. (1987) Heparin modulation of the neurotropic effects of acidic and basic fibroblast growth factors and nerve growth factor on PC-12 cells. *J. Cell. Physiol.* **131**, 131-140
8. Schweigerer, L., Neufeld, G., Friedman, J., Abraham, J. A., Fiddes, J. C. and Gospodarowicz, D. (1987) Capillary endothelial cells express basic fibroblast growth factor, a mitogen that stimulates their own growth. *Nature*, **325**, 257-259
9. Schweigerer, L., Neufeld, G., Mergia, A., Abraham, J. A., Fiddes, J. C. and Gospodarowicz, D. (1987) Basic fibroblast growth factor in human rhabdomyosarcoma

- cells: Implications for the proliferation and neovascularization of myoblast derived tumors. *Proc. Natl. Acad. Sci. USA.* **84**, 842-846
10. Schweigerer, L., Neufeld, G., Friedman, J., Abraham, J. A., Fiddes, J. C. and Gospodarowicz, D. (1987) Basic fibroblast growth factor: Production and growth stimulation in cultured adrenal cortex cells. *Endocrinology*, **120**, 796-800
 11. Schweigerer, L., Neufeld, G. and gospodarowicz, D. (1987) Basic fibroblast growth factor is present in cultured human retinoblastoma cells. *Invest. Ophthalmol. Vis. Sci.*, **28**, 98-103
 12. Neufeld, G. and Gospodarowicz, D. (1987) Protamine sulfate inhibits the mitogenic activities of the extracellular matrix and fibroblast growth factor, but potentiates that of epidermal growth factor. *J. Cell. Physiol.*, **132**, 287-294
 13. Neufeld, G., Ferrara, N., Schweigerer, L., Mitchell, R. and Gospodarowicz, D. (1987) Granulosa cells produce fibroblast growth factor. *Endocrinology*, **121**, 597-603
 14. Ferrara, N., Schweigerer, L., Neufeld, G., Mitchell, R. and Gospodarowicz, D. (1987) Pituitary follicular cells produce basic fibroblast growth factor. *Proc. Natl. Acad. Sci. USA.*, **84**, 5772-5787
 15. Schweigerer, L., Malerstein, B., Neufeld, G. and Gospodarowicz, D. (1987) Basic fibroblast growth factor is synthesized in cultured retinal pigment epithelial cells. *Biochem. Biophys. Res. Commun.* **143**, 934-940
 16. Schweigerer, L., Neufeld, G. and Gospodarowicz, D. (1987) Basic fibroblast growth factor as a growth inhibitor for cultured human tumor cells. *J. Clin. Invest.* **80**, 1516-1520
 17. Schweigerer, L., Ferrara, N., Neufeld, G. and Gospodarowicz, D. (1988) Basic fibroblast growth factor: Expression in cultured cells derived from corneal endothelium and lens epithelium. *Exp. Eye Res.* **46**, 71-80
 18. Neufeld, G., Mitchell, R., Ponte, P. and Gospodarowicz, D. (1988) Expression of human basic fibroblast growth factor cDNA in baby hamster kidney derived cells results in autonomous cell growth. *J. Cell Biol.*, **106**, 1385-1394
 19. Gospodarowicz, D., Ferrara, N., Haaparanta, T. and Neufeld, G. (1988) Basic fibroblast growth factor: Expression in cultured bovine smooth muscle cells. *Eur. J. Cell Biol.*, **46**, 144-151
 20. Neufeld, G. and Gospodarowicz, D. (1988) Identification of the fibroblast growth factor receptor in human vascular endothelial cells. *J. Cell. Pysiol.*, **136**, 537-542
 21. Kalcheim, C. and Neufeld, G. (1990) Expression of basic fibroblast growth factor in the nervous system of early avian embryos. *Development*, **109**, 203-215
 22. Safran, A., Avivi, A., Orr-Urtreger, A., Neufeld, G., Lonai, P., Givol, D. and Yarden, Y. (1990) The murine flg gene encodes a receptor for fibroblast growth factor. *Oncogene*, **5**, 635-643
 23. Tessler, S. and Neufeld, G. (1990) Basic fibroblast growth factor (bFGF) accumulates in the nuclei of various bFGF producing cell types. *J. Cell. physiol.* **145**, 310-317
 24. Vaisman, N., Gospodarowicz, D. and Neufeld, G. (1990) Characterization of the receptors for vascular endothelial growth factor. *J. Biol. Chem.*, **265**, 19461-19460

25. Raz, V., Kelman, Z., Avivi, A., Neufeld, G., Givol, D., and Yarden, Y. (1991) PCR based identification of new receptors: Molecular cloning of a receptor for fibroblast growth factor. *Oncogene*, **6**, 753-760
26. Peretz, D., Gitay-Goren, H., Safran, M., Kimmel, N., Gospodarowicz, D. and Neufeld, G. (1992) The glycosylation of vascular endothelial growth factor (VEGF) is not required for its mitogenic activity. *Biochem. Biophys. Res. Commun.*, **182**, 1340-1347
27. Gitay-Goren, H., Soker, S., Vlodaysky, I., and Neufeld, G. (1992) The binding of vascular endothelial growth factor to its receptors is dependent on cell surface associated heparin-like molecules. *J. Biol. Chem.*, **267**, 6093-6098.
28. Bashkin, P., Gitay-Goren, H., Neufeld, G., and Vlodaysky, I. (1992) Release of cell surface associated basic fibroblast growth factor by glycosyl phosphatidylinositol specific phospholipase C. *J. Cell. Physiol.*, **151**, 126-137
29. Brill, G., Vaisman, N., Neufeld, G., and Kalcheim, C. (1992) BHK-21-derived cell lines that produce basic fibroblast growth factor, but not parental BHK-21 cells, initiate neuronal differentiation of neural crest progenitors. *Development*, **115**, 1059-1069
30. Cohen, T., Gitay-Goren, H., Neufeld, G., and Levi, B-Z. (1992) Production of high levels of biologically active vascular endothelial growth factor (VEGF) using the baculovirus expression system. *Growth Factors*, **7**, 131-138.
31. Peretz, D., Kimel, N., Fujii, D. K. and Neufeld, G. (1993) Overexpression of basic fibroblast growth factor complementary DNA in Ha-*ras* transformed cells correlates with a decreased incidence of tumor necrosis. *Cancer Research*, **53**, 158-164.
32. Gitay-Goren, H., Halaban, R. and Neufeld, G. (1993) Vascular endothelial growth factor receptors are expressed in various human melanoma derived cells but not in normal melanocytes. *Biochem. Biophys. Res. Commun.*, **190**, 702-709
33. Shweiki, D., Itin, A., Neufeld, G., Gitay-Goren, H., and Keshet, E. (1993) Patterns of VEGF expression in-vivo suggest a role in physiological angiogenesis processes. *J. Clin. Invest.*, **91**, 2235-2243
34. Ron, D., Reich, R., Chedid, M., Lengel, C., Cohen, O. E., Chan, A. M-L., Neufeld, G., Miki, T. and Tronick, S. R. (1993) Binding properties of FGFR4, a fibroblast growth factor receptor that is over expressed in human breast carcinoma. *J. Biol. Chem.*, **268**, 5388-5394
35. Soker, S., Svahn, C. and Neufeld, G. (1993) vascular endothelial growth factor (VEGF) binds to α 2-macroglobulin and the binding is inhibited by heparin. *J. Biol. Chem.*, **268**, 7685-7691
36. Benezra, M., Vlodaysky, I., Neufeld, G. and Bar-Shavit, R. (1993) Thrombin induced release of active basic fibroblast growth factor - heparan sulfate complexes from subendothelial extracellular matrix. *Blood*, **81**, 3324-3331.
37. Tessler, S., Rockwell, P., Hicklin, D., Cohen, T., Levi, B-Z., Lemischka, I. R., Witte, L., and Neufeld, G. (1994) Heparin modulates the interaction of VEGF₁₆₅ with soluble and cell associated *flt-1* receptors. *J. Biol. Chem.* **269**, 12456-12461.
38. Yamane, A., Seetharam, L., Yamaguchi, S., Gotoh, N., Takahashi, T., Neufeld, G., and Shibuya, M. (1994) A new communication system between hepatocytes and sinusoidal endothelial cells in liver through vascular endothelial growth factor and *flt* tyrosine-kinase receptor family (*flt-1* and *KDR/flk-1*). *Oncogene*, **9**, 2683-2690.

39. Soker, S., Goldstaub, D., Svahn, C., Cohen, T., Levi, B-Z., Vlodaysky, I. and Neufeld, G. (1994) The effects of the size and sulfation of defined fragments of heparin on the interaction of vascular endothelial growth factor (VEGF) with VEGF receptors. *Biochem. Biophys. Res. Commun.*, **203**, 1339-1347.
40. Migdal, M. Soker, S., Yarden, Y. and Neufeld, G. (1995) Activation of a transfected FGFR-1 receptor in Madin-Darby epithelial cells results in a reversible loss of epithelial properties. *J. Cell. Physiol.*, **162**, 266-276.
41. Seetharam, L., Gotoh, N., Maru, Y., Neufeld, G., Yamaguchi, S., and Shibuya, M. (1995) A unique signal transduction from FLT tyrosine-kinase, a receptor for vascular endothelial growth factor (VEGF). *Oncogene*, **10**, 135-147
42. Rockwell, P., Neufeld, G., Glassman, A., Caron, D., and Goldstein, N. (1995) *In-vitro* neutralization of vascular endothelial growth factor activation of *flk-1* by a monoclonal antibody. *Mol. Cell. Diff.*, **3**, 91-109.
43. Cohen, T., Gitay-Goren, H., Sharon, R., Shibuya, M., Halaban, R., Levi, B-Z., and Neufeld, G. (1995) VEGF₁₂₁, a vascular endothelial growth factor (VEGF) isoform lacking heparin binding ability, requires cell-surface heparan-sulfates for efficient binding to the VEGF receptors of human melanoma cells. *J. Biol. Chem.*, **270**, 11322-11326.
44. Gengrinovitch, S., Greenberg, S. M., Cohen, T., Gitay-Goren, H., Rockwell, P., Maione, T. E., Levi, B-Z., and Neufeld, G. (1995) Platelet factor-4 inhibits the mitogenic activity of VEGF₁₂₁ and VEGF₁₆₅ using several concurrent mechanisms. *J. Biol. Chem.*, **270**, 15059-15065.
45. Baruch, Y., Shoshany, G., Neufeld, G., Enat, R. (1995) Basic fibroblast growth factor is hepatotropic for rat liver in regeneration. *J. Hepatol.*, **23**, 328-332.
46. Cohen, T., Nahari, D., Cerem, L. W., Neufeld, G., and Levi, B-Z. (1996) Interleukin-6 induces the expression of vascular endothelial growth factor (VEGF). *J. Biol. Chem.*, **271**, 736-741.
47. Gitay-Goren, H. Cohen, T., Tessler, S. Soker, S., Gengrinovitch, S., Rockwell, P., Klagsbrun, M., Levi, B-Z. and Neufeld, G. (1996) Selective binding of VEGF₁₂₁ to one of the three VEGF receptors of vascular endothelial cells. *J. Biol. Chem.*, **271**, 5519-5523
48. Soker, S., Fidler, H., Neufeld, G., Klagsbrun, M. (1996) Characterization of novel VEGF binding proteins associated with tumor cells that bind VEGF₁₆₅ but not VEGF₁₂₁. *J. Biol. Chem.*, **271**, 5761-5767
49. Poltorak, Z., Cohen, T., Sivan, T., Kandelis, Y., Spira, G., Vlodaysky, I., Keshet, E. and Neufeld, G. (1997) VEGF₁₄₅: a secreted VEGF isoform that binds to extracellular matrix. *J. Biol. Chem.*, **272**, 7151-7158
50. Soker, S., Takashima, S., Miao, H.Q. Neufeld, G., and Klagsbrun, M. (1998) Neuropilin-1 is expressed by endothelial and tumor cells as an isoform-specific receptor for vascular endothelial growth factor. *Cell*, **92**, 735-745
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 11. Gera Neufeld, Eli Keshet, Israel Vlodavsky, Zoya Poltorak: Angiogenic factor and use thereof in treating cardiovascular disease. Technion Research & Development Apr, 20 2006: US 20060084622
 12. Gera Neufeld, Eli Keshet, Israel Vlodavsky, Zoya Poltorak: Angiogenic factor and use thereof in treating cardiovascular disease. Technion Research & Development Sep, 4 2003: US 20030165467
 13. Gera Neufeld, Gal Akiri, Zahava Vadasz, Stela Gengrinovitch: Pharmaceutical compositions and methods useful for modulating angiogenesis and inhibiting metastasis and tumor fibrosis. Technion Research And Development Foundation Jun, 19 2003: US 20030114410
 14. Gera Neufeld, Eli Keshet, Israel Vlodavsky: Angiogenic factor and use thereof of treating cardiovascular disease. Technion Research & Development Nov, 24 1999: CN 97199495
 15. Patent application: High affinity molecules capable of binding a type-A plexin receptor and uses of same - Provisional application
 16. Agents which down-regulate Plexin-A receptors and uses of same - Provisional application
 17. Semaphorin 3C variants, compositions comprising said variants and methods of use thereof. Provisional patent 2013
 18. Two patents on the usage of modified sema3E and sema3C for treatment of angiogenic eye diseases (2016).

CONFERENCES

Invited Talks

1. Israel Biochemical Society Meeting, Tel-Aviv, 1991. Abstract: Identification of the vascular endothelial growth factor receptors.
2. Israel Endocrinological Society meeting, Medicine Week, Jerusalem, 1991. Abstract: Characterization of the vascular endothelial growth factor receptors.

3. The seventh Maimonides conference on cancer research, Ein-Gedi, 1991 The effect of heparin on the interaction between VEGF and its receptors.
4. Conference Jacques Monod on fibroblast growth factors, Aussois, France, 1992. BFGF and VEGF: Interactions with heparin and role in tumor development.
5. Conference of the Israel Society of Molecular Biology and Biochemistry, Tel-Aviv, Israel, 1993. Characterization of receptors for vascular endothelial growth factor.
6. Oncogene-Science/Pfizer Strategy Meeting, Westbrook, USA (1993): The interaction of VEGF with VEGF receptors and its modulation by heparin-like molecules.
7. The annual meeting of The Israel Biochemical Society. (1994) The effect of heparin on the binding of various VEGF forms to VEGF receptors.
8. Conference Jacques Monod on growth factor interactions with the extracellular matrix. Aussois, France, May 1994.
9. Conference on: Molecular cell biology of cytokines and matrix. Cardiff, Great-Britain, September 1994.
10. Meeting of the experimental biology societies of Israel, Eilat, October 1995.
11. Conference on signal transduction, Weizmann Inst. February, 1995
12. France-Israel international symposium on the extracellular matrix. Jerusalem, April 1995
13. German-Israel Foundation meeting in Ein-Gedi, March 1996.
14. Meeting of the Israeli Soc. of Physiology and Pharmacology, Maale Hachamisha, 1998: neuropilins and heparan-sulfates: Accessory receptors for VEGF
15. Annual Meeting of the Israeli Society of Endocrinology, (January 1998)
17. International Bat Sheva de-Rothschild Conference in Ein-Gedi on: Adhesion mediated signaling protein degradation and transcriptional regulation in cancer. (1999) The neuropilins: novel splice form specific VEGF receptors.
18. International Society of Vascular Biology Meeting, Sydney Australia (2001) Neuropilin-2: A novel splice variant specific VEGF receptor.
17. International conference on cancer microenvironment Baden-Baden Austria (2002). The neuropilins: splice variant specific VEGF co-receptors that are differentially expressed in arteries and veins.
- 18 Ilanit, conference of the Israeli Societies of experimental Biology (FISEB). Eilat (2002) The role of np2 in the development of arteries and veins.
19. DKFZ meeting, Berlin (2003) The role of semaphorins and neuropilins in tumor development.
20. EMBO workshop on semaphorins, Corsica (2003) Semaphorin-3F is an inhibitor of angiogenesis.
21. Annual meeting of the Israeli society of Fertility, Tel Aviv (2003) (plenary Lecture) From VEGF splice forms to semaphorins
22. Meeting of the Israeli Societies for Cell Biology and Developmental Biology, Eilat (2003)
23. Special seminar: From VEGF splice forms to semaphorins. (2003) Center for Cancer research, Torino, Italy.

24. ECM congress, From VEGF splice forms to semaphorins. Munich, 2004
25. 3rd Kloster Seeon meeting on angiogenesis, From VEGF splice forms to semaphorins. Germany, 2004.
26. International conference on cancer microenvironment Prague, The role of LOR-1 in the progression of breast cancer tumors. 2004.
27. First Annual ARVO/Pfizer Ophthalmics Research Institute Conference, Fort-Lauderdale, USA " From VEGF to Semaphorins 2005.
28. 2nd European conference on tumor angiogenesis. The neuropilins: Conveyors of VEGF induced pro-angiogenic and of semaphorin induced anti-angiogenic signaling, Germany, 2006.
29. 2nd international workshop on "Semaphorin Function and Mechanisms of Action" which May 8-11, 2008, in the Abbaye des vaux de Cernay: Direct effects on tumor cells versus anti angiogenic effects in semaphorin induced inhibition of tumor progression.
30. International Symposium "Vascular differentiation and remodeling", 16-19 July 2008, Frankfurt/Main, Germany: Direct effects on tumor cells versus anti-angiogenic effects in semaphorin induced inhibition of tumor progression.
31. Kloster Seeon meeting on celklular and molecular mechanisms of tumor progression and metastasis: Talk Title: The role of Loxl2 in angiogenesis and tumor progression. Germany, September 2009.
32. EMBO workshop on: "Guidance signals in cancer" 6 - 9 May, 2010 Camogli-Portofino Vetta, Italy: Talk Title: Distinct functional roles for different type-A plexins in endothelial cells and in cancer cells.
33. Conference on: "Fronteirs in cardiac and vascular regeneration" Trieste, Italy, 2012. Title of Talk: "Type-A plexins as versatile mediators of pro-angiogenic as well as of anti-angiogenic signal transduction".
34. EMBO workshop on semaphorins: "Differential changes in the expression levels of plexins fine tune responses to semaphorins." Paris, October 2013.

Contributed Talks

1. Gordon Research Conference on the Molecular and Genetic Basis of Cell Proliferation, Kimball Union college, RI, USA, 1987 (Speaker). Subject: Transformation of BHK-21 cells following over expression of bFGF cDNA.
2. Gordon research conference on proteoglycans, Salve Regina College, Newport, RI, USA, 1992. The effects of heparin on the interaction of VEGF with VEGF receptors and α 2-macroglobulin.
3. Gordon research conference on peptide growth factors. Kimball Union college, RI, USA, August, 1996. Isoform specific receptors of VEGF.
4. 4th Kloster Seeon meeting on angiogenesis, From VEGF splice forms to semaphorins. Germany, 2006.
5. Gordon conference on angiogenesis (Salve Regina College, Newport, RI, USA) 2007 Degradation by furin-like pro-protein convertases as a possible mechanism by which tumors evade the anti-angiogenic effects of semaphorin-3B.

6. 14th International Biennial Conference on Metastasis Research 2012, Brisbane, Australia, A furin resistant form of semaphorin-3E as a potential treatment for metastatic disease

SPECIAL PROFESSIONAL ACTIVITIES

Consultation

Sterling Drugs Inc. (1989-1992)
Collateral Therapeutics (1998-2002)
Arresto Biosciences (2007-2010)

MAJOR RESEARCH ACHIEVEMENTS

1. Demonstration that the G_s protein shuttles between the beta adrenergic receptor and adenylate-cyclase, and that the receptor is not required anymore once the G_s protein is activated: Ph.D. thesis, J. Biol. Chem. **255**, 9268-9274 (1980).
2. First identification of FGF receptors: J. Biol. Chem. **261**, 13860-13868, (1985).
3. First realization that basic fibroblast growth factor and acidic fibroblast growth factor bind to common cell surface receptors: J. Biol. Chem. **261**, 5631-5637 (1986).
4. Demonstration that endothelial cells synthesize large amounts of basic fibroblast growth factor but still require exogenous basic fibroblast growth factor to proliferate in cell culture: Nature, **325**, 257-259 (1987).
5. First demonstration that over-expression of the native basic fibroblast growth factor cDNA in cells can lead to cellular transformation: J. Cell Biol. **106**, 1385-1394, (1988).
6. First demonstration that basic fibroblast growth factor accumulates in the nuclei of basic fibroblast growth factor producing cells J. Cell. physiol. **145**, 310-317 (1990).
7. First molecular characterization and identification of vascular endothelial growth factor receptors in endothelial cells: J. Biol. Chem., **265**, 19461-19460, (1990).
8. First demonstration that the interaction of vascular endothelial growth factor with its cell surface receptors is influenced by cell surface associated heparin-like molecules: J. Biol. Chem., **267**, 6093-6098 (1992).
9. Identification of the product of the *flk-1* gene as a VEGF receptor and demonstration of the heparin dependency of VEGF₁₆₅ binding to this receptor in a cell free system. J. Biol. Chem. **269**, 12456-12461.
10. Characterization of differences between VEGF₁₂₁ and VEGF₁₆₅ in receptor binding experiments. J. Biol. Chem., **271**, 5761-5767
11. First characterization of VEGF₁₄₅, a new VEGF isoform. J. Biol. Chem., **272**, 7151-7158
12. First demonstration that heparan-sulfates can function as extracellular chaperones. J. Biol. Chem., **271**, 5519-5523

12. Identification of neuropilin-1 as an isoform specific receptor of VEGF. *Cell*, **92**, 735-745.
13. Demonstration that neuropilins are also receptors for placenta growth factor. *J. Biol. Chem.*, **273**, 22272-22278
14. Identification of glypican-1 as an endothelial cell surface proteoglycan that acts as a chaperone for heparin binding forms of VEGF. *J. Biol. Chem.* **274**, 10816–10822.
15. Identification of neuropilin-2 as a novel VEGF receptor. *J. Biol. Chem.* **275**, 18040-18045
16. First characterization of neuropilin-2 as a vein specific receptor and neuropilin-1 as an artery specific receptor. *Mech. Dev.*, **109**, 115-119.
17. Identification of lysyl-oxidase related protein-1 (LOXL2) as a protein that induces fibrosis and invasiveness in breast cancer tumors. *Cancer Res.*, **63**, 1657-1666.
18. First identification of a class-3 semaphorin (semaphorin-3F) as an anti-angiogenic molecule. *Cancer Res.* **64**, 1008-1015.
19. First demonstration showing that a point mutated furin resistant class-3 semaphorin can be used as a drug for the treatment of cancer. *EMBO Mol. Med.*, **4**, 234-250
20. First demonstration of RAMP3 as a pro-tumorigenic protein whose expression is regulated by LOXL2. *FASEB J.* **25**, 55-65