

CURRICULUM VITAE

NAME: Valerian E. Kagan

BUSINESS ADDRESS: Department of Environmental and Occupational Health
University of Pittsburgh
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EDUCATION AND TRAINING

Undergraduate

MV Lomonosov Moscow State University B.S. 1967 Biochemistry, Biophysics
Russia

MV Lomonosov Moscow State University M.S. 1968 Biochemistry, Biophysics
Russia

Graduate

MV Lomonosov Moscow State University Ph.D. 1972 Biochemistry, Biophysics
Russia

USSR Academy of Sciences, D.Sc. 1981 Biochemistry, Biophysics
Moscow, Russia

APPOINTMENTS AND POSITIONS

Academic

| | | |
|-----------|---------------------------------|--|
| 1968-1969 | Research Associate | MV Lomonosov Moscow State University |
| 1969-1970 | Research Associate | Institute of Oncology, Moscow |
| 1970-1972 | Research Associate | MV Lomonosov Moscow State University Department of Biophysics |
| 1972-1976 | Assistant Research Professor | MV Lomonosov Moscow State University Department of Biochemistry |
| 1977-1983 | Associate Research Professor | MV Lomonosov Moscow State University Department of Biochemistry |
| 1983-1989 | Head, Research Professor | Institute of Physiology, Bulgarian Academy of Sciences, Bulgaria, Membrane Biostabilization Group |

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|--------------|---|----------------------------------|
| 1989-1992 | University of California, Berkeley Department of Molecular and Cell Biology | Associate Research Biochemist |
| 1989-1992 | Lawrence Berkeley Laboratory, Berkeley | Visiting Scientist |
| 1992-1996 | University of Pittsburgh, Department of Environmental and Occupational Health | Associate Professor |
| 1996-2001 | University of Pittsburgh, Department of Environmental and Occupational Health | Associate Professor (tenured) |
| 1992-Present | University of Pittsburgh Cancer Institute | Member |
| 1997-2003 | University of Pittsburgh, Department of Pharmacology, Pittsburgh, PA | Associate Professor |
| 1999-2002 | Magee-Womens Research Institute Pittsburgh, PA | Associate Investigator |
| 1999-2012 | Division of Life Sciences, King's College, University of London, UK | Adjunct Professor |
| 2000-Present | Department of Environmental and Occupational Health University of Pittsburgh | Vice-Chairman |
| 2001-Present | Department of Environmental And Occupational Health | Professor |
| 2002-Present | Magee-Womens Research Institute Pittsburgh, PA | Senior Investigator |
| 2003-Present | Department of Pharmacology University of Pittsburgh | Professor |
| 2004-Present | Center for Free Radical and Antioxidant Health, University of Pittsburgh | Director |
| 2005-Present | School of Medicine, Department of Department of Pharmacology and Chemical Biology, University of Pittbsurgh | Professor |
| 2006-Present | University of Pittsburgh Nanotechnology Institute | Member |
| 2006-Present | University of Pittsburgh Drug Discovery Institute | Member |

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|--------------|---|-------------------------------|
| 2007-Present | Institute of Environmental Medicine, Karolinska Institute, Stockholm, Sweden | Adjunct Foreign, Professor |
| 2007-Present | Department of Radiation Oncology, School of Medicine, University of Pittsburgh | Professor |
| 2010-Present | Department of Chemistry, University of Pittsburgh | Professor |
| 2010-Present | Taipei Medical University, Taiwan | Professor |
| 2010-Present | Russian State Medical University, Moscow, Russia | Professor |
| 2010-Present | MV Lomonosov Moscow State University Moscow, Russia | Foreign Professor |
| 2011-Present | McGowan Institute for Regenerative Medicine, UPMC, University of Pittsburgh | Member Faculty |
| 2013-Present | Environmental Sciences, McMaster University, Hamilton, Canada | Fulbright Visiting Chair |
| 2013-Present | University of Tel-Aviv, Israel | Sackler Lecturer |

ADDITIONAL TEMPORARY APPOINTMENTS

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|------------------|---|--------------------------------|
| 1979, 1981, 1982 | Irkutsk State University, Irkutsk (Siberia) USSR | Visiting Professor |
| 1981 | University of Leipzig, Germany | Visiting Professor |
| 1987 | King's College, London | Visiting Research Professor |
| 1987, 1988, 1990 | World Health Organization, Geneva | Temporary Advisor |
| 1988 | University of California, Berkley | Visiting Scientist |

MEMBERSHIPS IN PROFESSIONAL AND SCIENTIFIC SOCIETIES

International Society for Free Radical Research
 Oxygen Society
 The Society of Toxicology
 American Society for Experimental Biology and Medicine
 International Society for Eye Research
 Association for Research in Vision and Ophthalmology
 American Association for Advancement of Science

HONORS

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| 1983 | State Prize of the USSR for Science (In the former USSR, the top 10-15 programs in Science were annually awarded this prize) |
| 2012 | Fellow, The American Association for the Advancement of Science |

PUBLICATIONS

BOOKS IN ENGLISH:

Kagan, V.E. Lipid peroxidation in biomembranes, CRC Press, Boca Raton, Florida, 1-184, 1988

Quinn, P.J., Kagan, V.E. (Eds). Subcellular Biochemistry: fat-soluble vitamins. Plenum Publishing Corp., N.Y., London, 1998

Kagan, V.E., Quinn, P.J. (Eds). Coenzyme Q: molecular mechanisms in health and disease. CRC Press, Boca Raton, 2001

Quinn, P.J., Kagan, V.E. (Eds). Phospholipid metabolism in apoptosis. Kluwer Academic/Plenum Publishers Corp., N.Y., Boston, Dordrecht, London, Moscow, 2002

PEER-REVIEWED PAPERS IN THE US AND INTERNATIONAL JOURNALS:

1. Kagan, V.E., Shvedova A.A., Novikov, K.N. and Kozlov, Y.P. Light-induced free radical oxidation of membrane lipids in photoreceptor of frog retina. *Biochim. Biophys. Acta*, 330,76-79, 1973.

2. Krasnovsky, A.A., and Kagan, V.E. Photosensitization and quenching of singlet oxygen by pigments and lipids of photoreceptor cells of the retina. *FEBS Lett.*, 108,1,152-154, 1979.

3. Tyurin, V.A., Kagan, V.E., Shukolyukov, S.A., Klaan, N.K., Novikov, K.N. and Azizova, O.A. Thermal stability of rhodopsin and lipid-protein interactions in the photoreceptor membranes of homoiothermic and poikilothermic animals. *J. Therm. Biol.*, 4,203-208, 1979.

4. Shvedova, A.A., Sidorov, A.S., Novikov, K.N., Galuschenko, I.V. and Kagan, V.E. Lipid peroxidation and electric activity of the retina. *Vision Res.*, 19,49-55, 1979.

5. Meerson, F.Z., Kagan, V.E., Kozlov, Y.P., Belkina, L.M. and Arkhipenko, Y.V. Role of lipid peroxidation in pathogenesis of ischemic damage and antioxidant protection of the heart. *Basic Res. Cardiol.*, 77,465-485, 1982.

6. Shvedova, A.A., Alekseeva, O.M., Kuliev, I.Y., Muranov, K.O., Kozlov, Y.P., and Kagan, V.E. Damage of photoreceptor membrane lipids and proteins induced by photosensitized oxidation. *Curr. Eye Res.*, 2,10,683-690, 1983.

7. Krasnovsky, A.A., Kagan, V.E. and Minin, A.A. Quenching of single oxygen luminescence by fatty acids and lipids. Contribution of physical and chemical mechanisms. *FEBS Lett.*, 155,2,233-236, 1983.

8. Erin, A.N., Skrypin, M.M., Tabidze, L.V. and Kagan, V.E. Formation of alpha-tocopherol complexes with fatty acids. A hypothetical mechanisms of stabilization of biomembranes by vitamin E. *Biochim. Biophys. Acta*, 774,96-102, 1984.

9. Erin, A.N., Spirin, M.M., Tabidze, L.V. and Kagan, V.E. Formation of alpha-tocopherol complexes with fatty acids. Nature of complexes. *Biochim. Biophys. Acta*, 815, 209-214, 1985.

10. Kagan, V.E., Serbinova, E.A., Novikov, K.N., Ritov, V.B., Kozlov, Y.P. and Stoytchev, T.S. Toxic and protective effects of antioxidants in biomembranes. *Arch. Toxicol. (Suppl.)*, 9, 302-305, 1986
11. Kagan, V.E., and Quinn, P.J. The interaction of alpha-tocopherol and homologues with shorter hydrocarbon chains with phospholipid bilayer dispersions. A fluorescence probe study. *Eur. J. Biochem.*, 171,3,661-667, 1988
12. Baldenkov, G.N., Serbinova, E.A., Bakalova, R.A., Tkachuk, V.A., Kagan, V.E. and Stoychev, T.S. The role of secondary messengers in the regulation of lipid peroxidation in rat liver microsomes. *Free Rad. Res. Communs.* 4, 5, 277-281, 1988
13. Kagan, V.E., Bakalova, R.A., Rangelova, D.S., Stoyanovsky, D.A., Koynova, G.M. and Wolinsky, I. Oxidative stress leads to inhibition of calcium transport by sarcoplasmic reticulum in skeletal muscle. *Proc. Soc. Exp. Biol. Med.*, 190,365-368, 1989
14. Serbinova, E.A., Kadiiska, M.B., Bakalova, R.A., Koynova, G.M., Stoyanovsky, D.A., Karakashev, P.C., Stoytchev, T.S., Wolinsky, I. and Kagan, V.E. Lipid peroxidation activation and cytochrome P-450 decrease in rat liver endoplasmic reticulum under oxidative stress. *Toxicol. Lett.*, 47,119-123, 1989
15. Kagan, V.E., Bakalova, R.A., Serbinova, E.A. and Stoytchev, T.S. Fluorescent measurements of incorporated and hydrolysis of tocopherol and its esters in biomembranes. *Meth. Enzymol.*, 186,355-367, 1989
16. Packer, L., Maguire, J.J., Melhorn, R.J., Serbinova, E.A., Kagan, V.E. Mitochondria and microsomal membranes have a free radical reductase activity that prevents chromanoxyl radical accumulation. *Biochem. Biophys. Res. Communs.*, 159,1,229-235, 1989
17. Stoyanovsky, D.A., Kagan, V.E., Packer, L. Iron binding to α -tocopherol-containing phospholipid liposomes. *Biochem. Biophys. Res. Commus.*, 160,2,834-838, 1989.
18. Kagan, V.E. Tocopherol stabilizers membrane against phospholipases A, free fatty acids and lysophospholipids. *Ann. N.Y. Acad. Sci.*, 570, 121-135, 1989.
19. Kagan, V.E., Serbinova, E.A., Packer, L. Recycling and antioxidant activity of tocopherol homologues of differing hydrocarbon chain length in liver microsomes. *Arch. Biochem. Biophys.*, 282, 2, 221-225, 1990.
20. Kagan, V.E., Bakalova, R.A., Zhelev, Zh., Zh., Rangelova, D.A., Serbinova, E.A., Tyurin, V.A., Denisova, N.K., Packer, L. Intermembrane transfer and antioxidant action of alpha-tocopherol in liposomes. *Arch. Biochem. Biophys.*, 280, 1, 147-152, 1990.
21. Kagan, V.E., Serbinova, E.A., Packer, L. Generation and recycling of radicals from phenolic antioxidants. *Arch. Biochem. Biophys.*, 280, 1, 33-39, 1990.
22. Kagan, V.E., Serbinova, E.A., Koynova, E.A., Kitanova, S.A., Tyurin, V.A., Stoytchev, T.S., Quinn, P.J., Packer, L. Antioxidant action of ubiquinol homologues with different isoprenoid chain length in biomembranes. *Free Rad. Biol. Med.*, 9, 117-126, 1990.
23. Kagan, V.E., Serbinova, E.A., Packer, L., Antioxidant effects of ubuquinones in microsomes and mitochondria are mediated by tocopherol recycling. *Biochem. Biophys. Res. Communs.*, 169, 3, 851-857, 1990.

24. Kagan, V.E., Serbinova, E.A., Bakalova, R.A., Stoytchev, T.S., Erin, A.N., Prilipko, L.L. and Evstigneeva, R.P. Mechanisms of stabilization of biomembranes by alpha-tocopherol: the role of the hydrocarbon chain in the inhibition of lipid peroxidation. *Biochem. Pharmacol.*, 40, 11, 2403-2413, 1990.
25. Konishi, T., Kagan, V.E., Matusgo, S., Packer, L. UV induced oxy-and chromanoxyl radicals in microsomes by a new photosensitive organic hydroperoxide, N, N¹-bis(2-hydroperoxy-2-methoxyethyl)-1,4,5,8-naphthalene-tetra-carboxylic-diimide (NP-III). *Biochem. Biophys. Res. Comm.* 175, 1, 129-133, 1991.
26. Serbinova, E.A., Kagan, V.E., Han, D., Packer, L. Intramembrane mobility and recycling in antioxidant properties of alpha-tocotrienol. *Free Rad. Biol. Med.* 10, 263-275, 1991.
27. Packer, L., Valenza, M., Serbinova, E.A., Starke-Reed, P., Frost, K., Kagan, V.E. Free radical scavenging is involved in the protective effect of 1-propionyl-carnitine against ischemia-reperfusing injury of the heart. *Arch. Biochem. Biophys.* 288, 2, 533-537, 1991.
28. Kagan, V.E., Freisleben, H.J., Tsuchiya, M., Forte, T., Packer, L. Generation of probucol radicals and their reduction by ascorbate and dihydrolipoic acid in human low density lipoproteins. *Free Radical Res. Commun.* 15, 273-284, 1991.
29. Maguire, J.J., Kagan, V.E., Serbinova, E.A., Ackrell, B.A., Packer, L. Succinate-ubiquinone reductase-linked recycling of alpha-tocopherol in reconstituted systems and mitochondria: requirement for reduced ubiquinone. *Arch. Biochem. Biophys.* 229, 47-53, 1992.
30. Kagan, V.E., Witt, E., Goldman, R., Scita, G., Packer, L. Ultraviolet light-induced generation of vitamin E radicals and their recycling. A possible photosensitizing effect of vitamin E in skin. *Free Radical Res. Commun.* 16, 51-64, 1992.
31. Kagan, V.E., Serbinova, E.A., Forte, T., Scita, G., Packer, L. Recycling of vitamin E in human low density lipoproteins. *J. Lipid Res.* 33, 385-397, 1992.
32. Reznick, A.Z., Kagan, V.E., Ramsey, R., Tsuchiya, M., Khwaja, S., Serbinova, E.A., Packer, L. Antiradical effects in L-propionyl carnitine protection of the heart against ischemia-reperfusion injury; the possible role of iron chelation. *Arch. Biochem. Biophys.* 296, 394-401, 1992.
33. Kagan, V.E., Serbinova, E.A., Safadi, A., Catudioc, J., Packer, L. NADPH-dependent inhibition of lipid peroxidation in rat liver microsomes. *Biochem. Biophys. Res. Commun.* 86, 74-80, 1992.
34. Kagan, V.E., Shvedova, A., Serbinova, E.A., Khan, S., Swansson, C., Powell, R., Packer, L. Dihydrolipoic acid - a universal antioxidant both in the membrane and in the aqueous phase. Reduction of peroxy, ascorbyl and chromanoxyl radicals. *Biochem. Pharmacol.* 44, 1637-1649, 1992.
35. Suzuki, Y.J., Tsuchiya, M., Safadi, A., Kagan, V.E., Packer, L. Antioxidant properties of nitecapone (OR-462). *Free Radical Biol. Med.* 13, 517-525, 1992.
36. Maguire, J.J., Kagan, V.E., Packer, L. Electron transport between cytochrome c and alpha-tocopherol. *Biochem. Biophys. Res. Commun.* 188, 190-197, 1992.

37. Tsuchiya M. Scita G. Freisleben HJ. Kagan VE. Packer L. Antioxidant radical-scavenging activity of carotenoids and retinoids compared to alpha-tocopherol. *Meth. Enzymol.* 213, 460-72, 1992.
38. Kagan V.E., Tsuchiya M, Serbinova E., Packer L., Sies, H. Interaction of the pyridoindole stobadine with peroxy, superoxide and chromanoxyl radicals. *Biochem. Pharmacol.*, 45, 393-400, 1993
39. Chatelain E., Boscoboinik D.O., Bartoli, G.-M., Kagan V.E., Gey F.K., Packer L., and Azzi A. Inhibition of smooth muscle cell proliferation and protein kinase C activity by tocopherols and tocotrienols. *Biochim.Biophys.Acta*, 1176, 83-89, 1993
40. Suzuki, Y., Tsuchiya, M., Wassall, S., Choo, Y., Govil, G., Kagan, V., and Packer, L. Structural and dynamic membrane properties of α -tocopherol and α -tocotrienol: implication to the molecular mechanism of their antioxidant potency. *Biochemistry*, 32, 10692-10699, 1993
41. Stoyanovsky, D., Yalowich, J., Gantchev, T., and Kagan, V. Tyrosinase-induced phenoxyl radicals of Etoposide (VP-16): interaction with reductants in model systems, K562 leukemic cell and nuclear homogenates. *Free Radical Res. Communs.*, 19, 371-386, 1993
42. Gantchev T. G., van Lier J. E., Stoyanovsky D.A., Yalowich J.C. and Kagan V. E. Interactions of the phenoxyl radical of an antitumor drug, etoposide (VP-16), with reductants in solution and in cell and nuclear homogenates. ESR and HPLC measurements. *Meth. Enzymol.*, 234, 643-654, 1994
43. Kagan V.E. and Packer L., Light-induced generation of the vitamin E radicals: a new method to assess vitamin E regeneration. *Meth. Enzymol.*, 234, 316-320, 1994
44. Kagan V.E., Serbinova E.A., Stoyanovsky D.A., Khwaja S. and Packer L. Assay of ubiquinones and ubiquinols as antioxidants. *Meth. Enzymol.*, 234, 343-354, 1994
45. Tsuchiya, M., Kagan, V.E., Freisleben, H.-J., Manabe, M., and Packer, L. Antioxidant activity of α -tocopherol, β -carotene and ubiquinol in membranes: cis-parinaric acid-incorporated liposomes. *Meth.Enzymol.*, 234, 371-383, 1994
46. Stoyanovsky, D.A., Salama, G., and Kagan V.E. Ascorbate/iron activates Ca^{2+} -release channels of skeletal sarcoplasmic reticulum vesicles reconstituted in lipid bilayers. *Arch. Biochem.Biophys.* 308, 214-221, 1994
47. Schwarz, M.A., Lazo, J.S., Yalowich, J.C., Reynolds, I., Kagan, V.E., Tyurin, V.A., Kim, Y.M., Watkins, S., Pitt, B. Cytoplasmic metallothionein overexpression protects NIH 3T3 cells from tert-butyl hydroperoxide toxicity. *J. Biol. Chem.*, 269, 15238-15243, 1994
48. N.F. Avrova, N.F., Tyurin, V.A., Tyurina, Y.Y., and Kagan, V.E. Gangliosides in postischemic cellular dysfunctions. *Ann.NY Acad.Sci.*, 723, 353-355, 1994
49. Kagan, V. E., Yalowich, J. C., Day, B. W., Goldman, R. R., and Stoyanovsky, D. A. Ascorbate is the primary reductant of the phenoxyl radical of etoposide (VP-16) in the presence of thiols both in cell homogenates and in model systems. *Biochemistry*, 33, 9651-9660, 1994

50. Engelman, D.T., Watanabe, M., Engelman, R.M., Rousou, J.A., Kisin, E.R., Kagan, V.E., Das, D.K. Hypoxic preconditioning preserves antioxidant reserve and prevents calcium overload in the ischemic/reperfused working heart. *Cardiovasc. Res.*, 29, 133-140, 1995
51. Tyurina, Y. Y., Tyurin, V.A., Yalowich, J.C., Quinn, P.J., Claycamp, H.G., Schor, N.F., Pitt, B.R., and Kagan, V.E. Phenoxyl radicals of etoposide (VP-16) can directly oxidize intracellular thiols: protective versus damaging effects of phenolic antioxidants. *Toxicol. Appl. Pharmacol.*, 131, 277-288, 1995
52. Menshikova, E.V., Ritov, V.B., Shvedova, A.A., Elsayed, N.M., Karol, M.H., and Kagan, V.E. Pulmonary microsomes contain a Ca^{2+} -transport system sensitive to oxidative stress. *Biochim. Biophys. Acta*, 1228, 165-174, 1995
53. D.A. Stoyanovsky, R. Goldman, D.T. Organisciak, R.M. Darrow, V.E. Kagan. Endogenous ascorbate regenerates vitamin E in the retina directly and in combination with dihydrolipoic acid. *Curr. Eye Res.*, 14, 181-189, 1995
54. Stoyanovsky, D.A., Goldman, R., Claycamp, H.G., Kagan, V.E., Phenoxyl radical-induced thiol-dependent generation of reactive oxygen species: implications for benzene toxicity. *Arch. Biochem. Biophys.*, 317, 315-323, 1995
55. Shvedova, A.A., Kisin, E.R., Kagan, V.E., Karol, M.H. Increased lipid peroxidation and decreased antioxidants in lungs of guinea pigs following an allergic pulmonary response. *Toxicol. Appl. Pharmacol.*, 132, 72-81, 1995
56. Goldman, R., Stoyanovsky, D.A., Day, B.W., Kagan, V.E. Reduction of phenoxyl radicals by thioredoxin results in selective oxidation of its SH-groups to disulfides. *Biochemistry*, 34, 4765-4772, 1995
57. Shvedova, A.A., Menshikova, E.V., Ritov, V.B., Kagan, V.E., Karol, M.H. Murine pulmonary Ca^{2+} -transport system activated by allergic immune response retains sensitivity to oxidative stress. *Exp. Lung Res.*, 21, 743-769, 1995
58. Gorbunov, N.V., Osipov, A.N., Day, B.W., Zayas-Rivera, B., Kagan, V.E., Elsayed, N.M. Reduction of ferrylmyoglobin and ferrylhemoglobin by nitric oxide: a protective mechanism against ferryl hemoprotein-induced oxidations. *Biochemistry*, 34, 6689-6699, 1995
59. Jones, D.P., Kagan, V.E., Aust, S.D., Reed, D.J., Omaye, S.T. Impact of nutrients on cellular lipid peroxidation and antioxidant defense system. *Fund. Appl. Toxicol.*, 26(1):1-7, 1995
60. Ritov, V.B., Goldman, R., Stoyanovsky, D.A., Menshikova, E.V., Kagan, V.E. Antioxidant paradoxes of phenolic compounds: peroxy radical scavenger and lipid antioxidant, Etoposide (VP-16), inhibits sarcoplasmic reticulum Ca^{2+} -ATPase via thiol oxidation by its phenoxyl radical. *Arch. Biochem. Biophys.*, 321, 140-152, 1995
61. Maulik, N., Watanabe, M., Engelman, D., Engelman, R.M., Kagan, V.E., Kisin, E., Tyurin, V., Cordis, G.A., Das, D.K. Myocardial adaptation to ischemia by oxidative stress induced by endotoxin. *Am. J. Physiol.*, (Cell Physiol.), 38, 907-916, 1995
62. Stoyanovsky, D.A., Osipov, A.N., Quinn, P.J., Kagan, V.E. Ubiquinone-dependent recycling of vitamin E radicals by superoxide. *Arch. Biochem. Biophys.*, 323, 343-351, 1995

63. Kurella, E.G., Osipov, A.N., Goldman, R., Boldyrev, A.A., and Kagan, V.E. Inhibition of Na,K-ATPase by phenoxyl radicals of etoposide (VP-16): role of sulfhydryls oxidation. *Biochim. Biophys. Acta*, 1232, 52-58, 1995
64. Elsayed, N.M., Tyurina, Y.Y., Tyurin, V.A., Menshikova, E.V., Kisin, E.R., and Kagan, V.E. Antioxidant depletion, lipid peroxidation, and impairment of calcium transport induced by air blast overpressure in rat lungs. *Exp. Lung Res.*, 22, 179-200, 1996
65. Yalowich, J.C., Tyurina, Y.Y., Tyurin, V.A., Allan, W.P., Kagan, V.E. Reduction of phenoxyl radicals of the antitumor agent, Etoposide (VP-16) by glutathione and protein sulfhydryls in human leukemia cells: implications for cytotoxicity. *Toxicology In Vitro*, 10, 59-68, 1996
66. Winer, R.I., Novikov, K.N., Ritov, V.B., Kagan, V.E., Alterman, M.A. Effect of different solubilizing agents on the aggregation state and catalytic activity of two purified rabbit cytochrome P450 isozymes, CYP1A2(LM4) and CYP2B4(LM2). *Biochem. Biophys. Res. Commun.*, 217, 886-891, 1996
67. Gorbunov, N.V.C., Osipov, A.N., Sweetland, M.A., Day, B.W., Elsayed, N.M., and Kagan, V.E. NO redox paradox: direct oxidation of α -tocopherol and α -tocopherol-mediated oxidation of ascorbate. *Biochem. Biophys. Res. Commun.*, 219, 835-841, 1996
68. Stoyanovsky, D.A., Goldman, R., Jonnalagadda, S.S., Day, B.W., Claycamp, H.G., Kagan, V.E. Detection and characterization of the EPR-silent glutathionyl-DMPO adduct derived from redox-cycling of phenoxyl radicals in model systems and HL-60 cells. *Arch. Biochem. Biophys.* 330, 3-11, 1996
69. Osipov, A.N., Gorbunov, N.V., Day, B.W., Elsayed, N.M., Kagan, V.E. Electron spin resonance and mass spectral analysis of interactions of ferrylhemoglobin and ferrylmyoglobin with nitric oxide. *Meth. Enzymol.*, 268, 193-203, 1996
70. Hubel, C.A., Kozlov, A.V., Kagan, V.E., Evans, R.W., Davidge, S.T., McLaughlin, M.K., Roberts, J.M. Decreased transferrin and increased transferrin saturation in sera of women with preeclampsia: implications for oxidative stress. *Amer. J. Obst. Gynecol.*, 175, 672-700, 1996
71. Purpura, P., Westman, L., Will, P., Eidelman, A., Kagan, V.E., Osipov, A.N., Schor, N.F. Adjunctive treatment of murine neuroblastoma with 6-hydroxydopamine and TEMPOL. *Cancer Res.* 56, 2336-2342, 1996
72. Kagan, V.E., Day, B.W., Elsayed, N.M., Gorbunov, N.V. Dynamics of nitrosylated hemoglobin in blood. *Nature*, 383, 30-31, 1996
73. Ritov, V.B., Menshikova, E.V., Goldman, R., Kagan, V.E. Direct oxidation of poly-unsaturated *cis*-parinaric fatty acid by phenoxyl radicals generated by peroxidase/ H_2O_2 in model systems and in HL-60 cells. *Toxicol. Lett.*, 87, 121-129, 1996
74. Ritov, V.B., Banni, S., Yalowich, J.C., Day, B.W., Claycamp, H.G., Corongiu, F.P., Kagan, V.E. Non-random peroxidation of different classes of membrane phospholipids in live cells detected by metabolically integrated *cis*-parinaric acid. *Biochim. Biophys. Acta*, 1283, 127-140, 1996

75. Muldoon, M.F., Kritchevsky, S.B., Evans, R.W., Kagan, V.E. Serum total antioxidant activity in relative hypo- and hypercholesterolemia. *Free Radical Res.* 25, 239-245, 1996
76. Maulik, N., Engelman, D.T., Watanabe, M., Engelman, R.M., Rousou, J.A., Flack, J.A., Deaton, D.W., Gorbunov, N.V., Elsayed, N.M., Kagan, V.E., Das, D.K. Nitric oxide/carbon monoxide: a molecular switch for myocardial preservation during ischemia. *Circulation*, 94, II-398-II406, 1996
77. Gorbunov, N.V., Elsayed, N.M., Kisin, E.R., Kozlov, A.V., Kagan, V.E. Air blast overpressure induces oxidative stress in rat lungs: interplay between hemoglobin, antioxidants and lipid peroxidation. *Am. J. Physiol.: Lung Cell. Molec. Physiol.*, 16(2):L 320-L 334, 1997
78. Fabisiak, J.P., Kagan, V.E., Ritov, V.B., Johnson, D.E., Lazo, J.S. Bcl-2 inhibits selective oxidation and externalization of phosphatidylserine during paraquat-induced apoptosis. *Am. J. Physiol.: Cell Physiol.*, 41(2):C 675-C 684, 1997
79. Tyurin, V.A., Carta, G., Tyurina, Y.Y., Banni, S., Day, B.W., Corongiu, F.P., Kagan, V.E. Peroxidase-catalyzed oxidation of b-Carotene in HL-60 cells and in model systems: involvement of phenoxyl radicals. *Lipids*, 32(2):131-142, 1997
80. Osaka, K., Ritov, V.B., Bernardo, J.F., Branch, R.A., Kagan, V.E. Amphotericin B protects cis-parinaric acid against peroxy radical-induced oxidation: amphotericin B as an antioxidant. *Antimicrob. Agents and Chemother.*, 41(4):743-747, 1997
81. Goldman, R., Tsyrllov, I.B., Grogan, J., Kagan, V.E. Reactions of phenoxyl radicals with NADPH-cytochrome P-450 reductase and NADPH: reduction of the radicals and inhibition of the enzyme. *Biochemistry*, 36(11):3186-3192, 1997
82. Gorbunov, N.V., Yalowich, J.C., Gaddam, A.S., Thampatty, P., Kisin, E.R., Elsayed, N.M., Kagan, V.E. Nitric oxide prevents oxidative damage produced by tert-butyl hydroperoxide in erythroleukemia cells via nitrosylation of heme and non-heme iron: electron paramagnetic resonance evidence. *J. Biol. Chem.*, 272, 12328-12341, 1997
83. Goldman, R., Bors, W., Michel, M., Day, B. W., and Kagan, V.E. Environmental and nutritional phenols: bioactivation to phenoxyl radicals and their cytotoxic and/or protective interactions with intracellular reductants. *Env. Nutr. Interactions.*, 1(2), 97-118, 1997
84. Hubel, C.A., Kagan, V.E., Kisin, E.R., McLaughlin, M.K., Roberts, J.M. Increased ascorbyl radical production and ascorbate depletion in plasma from women with preeclampsia: implications for oxidative stress. *Free Radical Biol. Med.*, 23(4), 596-609, 1997
85. Craven, P.A., DeRubertis, F.R., Kagan, V.E., Melhem, M., Studer, R.K. Effects of supplementation with vitamin C or E on albuminuria, glomerular TGF β and size in diabetes. *J. Am. Soc. Nephrol.* 8: 1405-1414, 1997
86. Tyurina, Y.Y., Tyurin, V.A., Carta, G., Quinn, P.J., Schor, N.F., Kagan, V.E. Direct evidence for antioxidant effect of Bcl-2 in PC-12 rat pheochromocytoma cells. *Arch. Biochem. Biophys.*, 344, 413-423, 1997

87. Osaka, K., Tyurina, Y.Y., Dubey, R.K., Tyurin, V.A., Ritov, V.B., Quinn, P.J., Branch, R.A., Kagan, V.E. Amphotericin B acts as an intracellular antioxidant: protection against 2,2'-azobis(2,4-dimethylvaleronitrile)-induced peroxidation of membrane phospholipids in rat aortic smooth muscle cells. *Biochem. Pharmacol.*, 54, 937-945, 1997
88. Elsayed, N.M., Gorbunov, N.M., Kagan, V.E. A proposed biochemical mechanism involving hemoglobin for blast overpressure-induced injury. *Toxicology*, 121, 81-90, 1997
89. Maulik, G., Maulik, N., Bhandari, V., Kagan, V.E., Pakrashi, S., Das, D.K. Evaluation of antioxidant effectiveness of a few herbal plants. *Free Radical Res.* 27(2): 221-228, 1997
90. Pitt, B.R., Schwarz, M., Woo, E.S., Yee, E., Wasserloos, K., Tran, S., Weng, W., Mannix, R.J., Watkins, S.A., Tyurina, Y.Y., Tyurin, V.A., Kagan, V.E., Lazo, J.S. Over-expression of metallothionein decreases the sensitivity of pulmonary endothelial cells to oxidant injury. *Am. J. Physiol.: Lung Cell. Molec. Physiol.*, 17(4): L 856-L 865, 1997
91. Omaye, S.T., Krinsky, N.I., Kagan, V.E., Mayne, S.T., Liebler, D.T., Bidlack, W.R. β -Carotene: friend or foe? *Fund. Appl. Toxicol.*, 40, 163-174, 1997
92. Maulik, N., Kagan, V.E., Tyurin, V.A., Das, D.K. Redistribution of membrane phosphatidylethanolamine and phosphatidylserine precedes the reperfusion-induced apoptosis in heart. *Am. J. Physiol.: Heart Circul. Physiol.*, 43(1): H 242-H 248, 1998
93. Gorbunov, N.V., Tyurina, Y.Y., Salama, G., Day, B.W., Claycamp, H.G., Argyros, G., Elsayed, N.M., Kagan, V.E. Nitric oxide protects cardiomyocytes against *tert*-butyl hydroperoxide-induced formation of alkoxyl and peroxy radicals and peroxidation of phosphatidylserine. *Biochem. Biophys. Res. Commun.*, 244, 647-651, 1998
94. Fabisiak, J.P., Kagan, V.E., Tyurina, Y.Y., Tyurin, V.A., Lazo, J.S. Paraquat-induced phosphatidylserine oxidation and apoptosis is independent of activation of phospholipase A2. *Am. J. Physiol.: Lung Cell. Molec. Physiol.*, 18(5), L 793-L 802, 1998
95. Katz, L.M., Callaway, C.W., Kagan, V.E., Kochanek, P.M. ESR measure of brain antioxidant activity during ischemia/reperfusion. *Neuroreport*, 9(7), 1587-1593, 1998
96. Kagan, V.E., Arroyo, A., Tyurin, V.A., Tyurina, Y.Y., Villalba, J.M., Navas, P. Plasma membrane NADH-coenzyme Q₀ reductase generates semiquinone radicals and recycles vitamin E homologue in a superoxide-dependent reaction. *FEBS Lett.*, 428, 43-46, 1998
97. Kagan, V.E., Tyurina, Y.Y. Recycling and redox cycling of phenolic antioxidants. *Ann. N.Y. Acad. Sci.*, 854, 425-434, 1998
98. Tyurin, V.A., Tyurina, Y.Y., Quinn, P.J., Schor, N.F., Balachandran, B.W., Day, Kagan, V.E. Glutamate-induced cytotoxicity in PC12 pheochromocytoma cells: role of oxidation of phospholipids, glutathione and protein sulfhydryls revealed by *bcl-2* transfection. *Mol. Brain Res.*, 60, 270-281, 1998
99. Fabisiak, J.P., Tyurina, Y.Y., Tyurin, V.A., Lazo, J.S., Kagan, V.E. Random versus selective membrane phospholipid oxidation in apoptosis: role of phosphatidylserine. *Biochemistry*, 37, 13781-13790, 1998

100. Shvedova, A. A., Tyurina, Y.Y., Gorbunov, N.V., Tyurin, V.A., Castranova, V., Ojimba, J., McLaughlin, M.K., Kagan, V.E. *tert*-Butyl hydroperoxide/hemoglobin-induced oxidative stress and damage to mesenteric smooth muscle cells: different effects of nitric oxide and nitrosothiols. *Biochem. Pharmacol.*, 57, 989-1001, 1999
101. Dubey, R.K., Tyurina, Y.Y., Tyurin, V.A. Gillespi, D., Branch, R.A., Jackson, E.K., Kagan, V.E. Estrogen and tamoxifen metabolites protect smooth muscle cell membrane phospholipids against peroxidation and inhibit cell growth. *Circulat. Res.*, 84: 229-239, 1999
102. Day, B.W., Tyurin, V.A., Tyurina, Y.Y., Liu, M., Facey, J.A., Carta, G., Kisin, E.R., Dubey, R.K., Kagan, V.E. Peroxidase-catalyzed pro- versus anti-oxidant effects of 4-hydroxytamoxifen – enzyme specificity and biochemical sequelae. *Chem. Res. Toxicol.*, 12(1):28-37, 1999
103. Fabisiak, J.P., Tyurin, V.A., Tyurina, Y.Y., Borisenko, G.G., Korotaeva, A., Pitt, B.R., Lazo, J.S., Kagan, V.E. Redox regulation of copper-metallothionein. *Arch. Biochem. Biophys.* 363, 171-181, 1999
104. Quinn, P.J., Fabisiak, J.P., Kagan, V.E. Expansion of antioxidant function of vitamin E by coenzyme Q. *Biofactors* 9: 149-154, 1999
105. Shvedova, A.A., Osipov, A.N., Jeffries, B.A., Kommineni, C., Vallyathan, V., Castranova, V., Kagan, V.E. Peroxidase/H₂O₂ enhances hypersensitivity responses induced by eugenol: inhibitory effect of an antioxidant, lipoic acid. *Env. Nutr. Interactions*, 3, 15-32, 1999
106. Schor, N.F., Tyurina, Y.Y., Fabisiak, J.P., Tyurin, V.A., Lazo, J.S., Kagan, V.E. Bcl-2-induced potentiation of apoptosis: enhancement of reducing potential and externalization of membrane phosphatidylserine. *Brain Res.* 831: 125-130, 1999
107. Menshikova, E.V., Ritov, V.B., Gorbunov, N.V., Salama, G., Claycamp, H.G., Kagan, V.E. Nitric oxide prevents myoglobin/*tert*-butyl hydroperoxide-induced inhibition of Ca²⁺-transport in skeletal and cardiac sarcoplasmic reticulum. *Ann. N.Y. Acad. Sci.*, 874: 371-385 1999
108. Kagan, V.E., Yalowich, J.C., Borisenko, G.G., Tyurina, Y.Y., Tyurin, V.A., Thampatty, P., Fabisiak, J.P. Mechanism-based chemopreventive strategies against etoposide-induced acute myeloid leukemia: free radical/antioxidant approach. *Mol. Pharmacol.* 56: 494-506. 1999
109. Schor, N.F., Tyurina, Y.Y., Tyurin, V.A., Kagan, V.E. Differential antioxidant effects of immediate and long-term estradiol treatment of MCF-7 breast cancer cells. *Biochem. Biophys. Res. Commun.* 260: 410-415, 1999
110. Fabisiak, J.P., Pearce, L.L., Borisenko, G.G., Tyurina, Y.Y., Tyurin, V.A., Razzack, J., Lazo, J.S., Pitt, B.R., Kagan, V.E. Bifunctional anti-/prooxidant potential of metallothionein: redox- signaling of copper binding and release. *Antiox. Redox Signal.*, 1, 349-364, 1999
111. Yalowich, J.C., Gorbunov, N.V., Kozlov, A.V., Allan, W., Kagan, V.E. Mechanisms of nitric oxide protection against *tert*-butyl hydroperoxide-induced cytotoxicity in iNOS-transduced human erythroleukemia cells. *Biochemistry*, 38: 10691-10698, 1999
112. Lange, R.W., Day, B.W., Lemus, R., Tyurin, V.A., Kagan, V.E., Karol, M.H. Intracellular S-glutathionyl adducts in murine lung and human bronchoepithelial cells after exposure to diisocyanatotoluene. *Chem. Res. Toxicol.*, 12: 931-936 1999

113. Goldman, R., Claycamp, H.G., Sweetland, M.A., Sedlov, A.V., Tyurin, V.A., Kisin, E.R., Tyurina, Y.Y., Ritov, V.B., Wenger, S.L., Grant, S.G., Kagan, V.E. Myeloperoxidase-catalyzed redox-cycling of phenol promotes lipid peroxidation and thiol oxidation in HL-60 cells. *Free Radical Biol. Med.*, 27, 1050-1063, 1999
114. Fabisiak, J.P., Tyurin, V.A., Tyurina, Y.Y., Sedlov, A., Lazo, J.S., Kagan, V.E. Nitric oxide dissociates lipid oxidation from apoptosis and phosphatidylserine externalization during oxidative stress. *Biochemistry*, 39: 127-138, 2000.
115. Shvedova, A.A., Kommineni, C., Jeffries, B.A., Castranova, V., Tyurina, Y.Y., Tyurin, V.A., Serbinova, E.A., Fabisiak, J.P., Kagan, V.E. Redox-cycling of phenol induces oxidative stress in human epidermal keratinocytes. *J. Invest.Dermatol.*, 114: 354-364, 2000
116. Schor, N.F., Rudin, C.M., Hartman, A.-R., Thompson, C.B., Tyurina, Y.Y., Kagan, V.E. Cell line dependence of Bcl-2-induced alteration of glutathione handling. *Oncogene*, 19: 472-476, 2000
117. Boota, A, Johnson, B., Lee, K., Blaskovich, M.A., Hamilton, A., Liu, S.X., Kagan, V.E., Pitt., B., Davies, P. Superoxide production by pulmonary vascular smooth muscle cells requires farnesylated and geranylgeranylated proteins. *Am.J.Physiol. Lung, Cel.Mol.Physiol.*, 278: L329-L334, 2000
118. Borisenko, G.G., Kagan, V.E., Hsia, C.J.C., Schor, N.F. Interaction between 6-hydroxydopamine and transferrin: "let my iron go." *Biochemistry*, 39: 3392-3400, 2000
119. Fabisiak, J.P., Ritov, V.B., Kagan, V.E. Reversible thiol-dependent activation of ryanodine-sensitive Ca^{2+} release channel (RyR) by etoposide (VP-16) phenoxyl radical. *Antiox. Redox Signal.*, 2, 73-82, 2000
120. Kagan, V.E., Kuzmenko, A.A., Shvedova, A.A., Kisin, E.R., Tyurina, Y.Y., Yalowich, J.C. Myeloperoxidase-catalyzed phenoxyl radicals of vitamin E homologue, 2,2,5,7,8-pentamethyl-6-hydroxy-chroman, do not induce oxidative stress in live HL-60 cells. *Biochem. Biophys. Res. Commun.*, 270: 1086-1092, 2000
121. Tyurina, Y.Y., Shvedova, A.A., Kawai, K., Tyurin, V.A., Kommineni, C., Quinn, P.J., Schor, N.F., Fabisiak, J.P., Kagan, V.E. Phospholipid signaling in apoptosis: peroxidation and externalization of phosphatidylserine. *Toxicol.*, 148: 93-101, 2000
122. Arroyo, A., Kagan, V.E., Tyurin, V.A., Burgess, J.R., de Cabo, R., Navas P., Villalba, J.M. NADH and NADPH-dependent reduction of coenzyme Q at the plasma membrane. *Antiox. Redox Signal.*, 2, 251-262, 2000
123. Kagan, V.E., Fabisiak, J.P., Quinn, P.J. Coenzyme Q and vitamin E need each other as antioxidants. *Protoplasma*, 214: 11-18, 2000
124. Kagan, V.E., Fabisiak, J.P., Shvedova, A.A., Tyurina, Y.Y., Tyurin, V.A., Schor, N.F., Kawai, K. Oxidative signaling pathway for externalization of plasma membrane phosphatidylserine during apoptosis. *FEBS Lett.*; 477: 1-7, 2000
125. Tyurin, V.A., Tyurina, Y.Y., Borisenko, G.G., Sokolova, T.V., Ritov, V.B., Quinn, P.J., Rose, M., Kochanek, P., Graham, S.H., Kagan, V.E. Oxidative stress following traumatic brain injury in rats: Quantitation of biomarkers and detection of free radical intermediates. *J. Neurochem.*, 75: 2178-2189, 2000

126. Liu, S-X., Fabisiak, J.P., Tyurin, V.A., Borisenko, G.G., Pitt, B.R., Lazo, J.S., Kagan, V.E. Redox regulation of copper delivery by metallothioneins: reconstitution of apo-superoxide dismutase by nitric oxide-induced copper transfer. *Chem Res. Toxicol.* 13: 922-931, 2000
127. Vladimirov, Y.A., Arroyo, A., Taylor, J.M., Tyurina, Y.Y., Matura, T., Tyurin, V.A., Kagan, V.E. Quinolizin-coumarins as physical enhancers of chemiluminescence during lipid peroxidation in live HL-60 cells. *Arch. Biochem. Biophys.* 384: 154-162, 2000
128. Kawai, K., Liu, S.X., Tyurin, V.A., Tyurina, Y.Y., Borisenko, G.G., Jiang, J.F., St. Croix, C.M., Fabisiak, J.P., Pitt, B.R., and Kagan, V.E. Antioxidant and anti-apoptotic function of metallothioneins in HL-60 cells challenged with Cu-NTA. *Chem Res. Toxicol.* 13(12):1275-1286, 2000
129. Liu, S-X., Kawai, K., Tyurin, V.A., Tyurina, Y.Y., Borisenko, G.G., Fabisiak, J.P., Pitt, B.R., Kagan, V.E. Nitric oxide-dependent pro-oxidant and pro-apoptotic effect of metallothioneins in HL-60 cells challenged with cupric nitrilotriacetate. *Biochem. J.* 354(Pt 2): 397-406, 2001
130. Shvedova, A.A., Tyurina, Y.Y., Tyurin, V.A., Kikuchi, Y., Kagan V.E., Quinn P.J. Quantitative analysis of phospholipid peroxidation and antioxidant protection in live human epidermal keratinocytes. *Biosc.Reports*, 21: 33-43, 2001
131. Tyurin, V.A., Liu, S-X., Tyurina, Y.Y., Sussman, N.B., Hubel, C.A., Roberts, J.M., Taylor, R.N., Kagan, V.E. Elevated levels of S-nitrosoalbumin in preeclampsia plasma. *Circ. Res.*, 88:1210-1215, 2001
132. Kagan, V.E., Kozlov, A.V., Tyurina, Y.Y., Shvedova, A.A., Yalowich, J.C. Antioxidant mechanisms of nitric oxide against iron-catalyzed oxidative stress in cells. *Antioxid Redox Signal.* 3:189-202, 2001.
133. Kagan, V.E., Laskin, J.D. Direct and indirect antioxidant effects of nitric oxide: radically unsettled issues. *Antioxid Redox Signal.* 3:173-175, 2001
134. Kagan, V.E., Tyurin, V.A., Borisenko, G.G., Fabisiak, J.P., Hubel, C.A., Ness, R.B., Gandley, R., McLaughlin, M.K., Roberts, J.M. Mishandling of Copper by Albumin: Role in Redox-Cycling and Oxidative Stress in Preeclampsia Plasma. *Hypertens. Pregn.*, 20 (3), 221-241, 2001
135. Tyurina, Y.Y., Tyurin, V.A., Shvedova, A.A., Fabisiak, J.P., Kagan, V.E. Peroxidation of phosphatidylserine in mechanisms of apoptotic signaling. *Meth.Enzymol.*, 352, 159-174, 2002
136. Fabisiak, J.P., Borisenko, G.G., Liu, S.X., Tyurin, V.A., Pitt, B.R., Kagan, V.E. Redox sensor function of metallothioneins. *Meth.Enzymol.*, 353: 268-281, 2002
137. Tyurin, V.A., Tyurina, Y.Y., Liu, S.X., Bayir, H., Hubel, C.A., Kagan, V.E. Quantitation of S-nitrosothiols in cells and biological fluids. *Meth.Enzymol.*, 352, 347-360, 2002
138. Greenberger, J.S., Kagan, V.E., Pearce, L., Borisenko, G.G., Tyurina, Y.Y., Epperley, M.W. Modulation of redox signal transduction pathways in the treatment of cancer. *Antioxid Redox Signal.* 3, 347-359, 2001
139. Epperly, M.W., Kagan, V.E., Sikora, C.A., Gretton, J.E., Defilippi, S.J., Bar-Sagi, D., Greenberger, J.S. Manganese superoxide dismutase-plasmid/liposome (MnSOD-PL) administration protects mice from esophagitis associated with fractionated radiation. *Int J Cancer* 96: 221-231. 2001

140. Kagan, V.E., Kuzmenko, A.I., Tyurina, Y.Y., Shvedova, A.A., Matsura, T., Yalowich, J.C. Prooxidant and Antioxidant Mechanisms of Etoposide in HL-60 Cells: Role of Myeloperoxidase. *Cancer Res.* 61: 7777-7784, 2001
141. Behringer, W., Safar, P., Kentner, R., Wu, X., Kagan, V.E., Radovsky, A., Clark, R.S.B., Kochanek, P.M., Subramanian, M., Tyurin, V.A., Tyurina, Y.Y., Tisherman, S.A. Antioxidant Tempol enhances hypothermic cerebral preservation during prolonged cardiac arrest in dogs. *J Cereb Blood Flow Metab.* 22: 105-117, 2002
142. Bayir, H., Kagan, V.E., Tyurina, Y.Y., Tyurin, V.A., Ruppel, R.A., Adelson, P.D., Graham, S.H., Janesko, K., Clark, R.S.B., Kochanek, P.M. Assessment of antioxidant reserves and oxidative stress in cerebrospinal fluid after severe traumatic brain injury in infants and children. *Pediatr. Res.*, 51: 571-578, 2002
143. Shvedova, A.A., Tyurina, Y.Y., Kawai, K., Tyurin, V.A., Kommineni, C., Fabisiak, J.P., Kagan, V.E. Selective peroxidation and externalization of phosphatidylserine in normal human epidermal keratinocytes during oxidative stress induced by cumene hydroperoxide. *J. Invest. Dermatol.*, 118: 1008-1018, 2002
144. Koty, P., Tyurina, Y.Y., Tyurin, V.A., Liu, S.X, Kagan, V.E. Depletion of Bcl-2 by anti-sense-bcl-2 oligonucleotide induces oxidation and externalization of phosphatidylserine at early stages of apoptosis in NCI-H226 carcinoma cells. *Mol.Cell. Biochem.*, 234-235: 125-133, 2002
145. Modriansky, M., Tyurina, Y.Y., Tyurin, V.A., Matsura, T., Shvedova, A.A., Yalowich, J.C., Kagan, V.E. Anti-/pro-oxidant effects of phenolic compounds in cells: are colchicine metabolites chain-breaking antioxidants? *Toxicol.* 177: 105-117, 2002
146. Kagan, V.E., Kisin, E.R., Kawai, K., Serinkan, B.F., Osipov A.N., Serbinova, E.A., Wolinsky, I., Shvedova, A.A. Towards mechanism-based antioxidant interventions: lessons from natural antioxidants. *Ann.N.Y.Acad.Sci.*, 959:188-198, 2002
147. Kagan, V.E., Gleiss, B., Tyurina, Y.Y., Tyurin, V.A., Elenström-Magnusson, C., Liu, S.X., Serinkan, B.F., Arroyo, A., Chandra, J., Orrenius, S., and Fadeel, B. A role for oxidative stress in apoptosis: oxidation and externalization of phosphatidylserine is required for macrophage clearance of cells undergoing Fas-mediated apoptosis. *J. Immunol.*, 169: 487-499, 2002
148. Fabisiak, J.P., Sedlov, A., Kagan, V.E. Quantitative fluorescence-based SDS-PAGE assay of oxidative/nitrosative modification of Cys34 in human serum albumin in plasma. *Antioxid Redox Signal.*, 4(5):855-65, 2002
149. Matsura, T., Serinkan, B.F., Jiang, J., Kagan, V.E. Phosphatidylserine peroxidation/ externalization during staurosporine-induced apoptosis in HL-60 cells. *FEBS Lett.*, 524: 25-30, 2002
150. Jiang, J., St. Croix, C.M., Sussman, N., Zhao, Q., Pitt, B.R., Kagan, V.E. Contribution of glutathione and metallothioneins to protection against copper toxicity and redox-cycling: quantitative analysis using MT+/+ and MT-/- mouse lung fibroblasts. *Chem Res. Toxicol.*, 15: 1080-1087, 2002
151. Ritov, V.B., Kelley, D.E., Kagan V.E. Optimized derivatization of F2-isoprostanes with 1-pyrenyl-diazomethane for their subsequent determination by fluorescence HPLC. *Analyt. Biochem.*, 311: 10-18, 2002

152. Arroyo, A., Modriansky, M., Serinkan, F.B., Bello, R.I., Matura, T., Jiang, J., Tyurin, V.A., Tyurina, Y.Y., Fadeel, B., Kagan, V.E. NADPH oxidase-dependent oxidation and externalization of phosphatidylserine during apoptosis in DMSO-differentiated HL-60 cells: Role in phagocytic clearance. *J. Biol. Chem.*, 277: 49965-49975, 2002
153. Hubel CA, Kagan VE, Roberts JM. 8,12-iso-iPF₂α-VI: The last word on oxidative stress? *Am J Obstet Gynecol* 187: 1119, 2002
154. Elsayed NM, Gorbunov NV, Mayorga MA, Kagan VE, Januszkiewicz AJ. Significant pulmonary response to a brief high-level, nose-only nitrogen dioxide exposure: an interspecies dosimetry perspective. *Toxicol Appl Pharmacol.* 184: 1-8, 2002
155. Kentner R, Safar P, Behringer W, Wu X, Kagan VE, Tyurina YY, Henchir J, Ma L, Hsia CJ, Tisherman SA. Early Antioxidant Therapy with Tempol during Hemorrhagic Shock Increases Survival in Rats. *J Trauma.* 53: 968-977, 2002
156. Bayir, H., Kochanek, P.M., Liu, S.X., Arroyo, A., Osipov, A., Wisniewski, S., Adelson, P.D., Graham, S.H., Kagan, V.E. Increased S-nitrosothiols and S-nitrosoalbumin in cerebrospinal fluid after cerebral traumatic brain injury in infants and children: association with intracranial pressure. *J Cereb Blood Flow Metab.* 23: 51-61, 2003
157. Kagan, V.E., Kuzmenko, A.I., Shvedova, A.A., Kisin, E.R., Li, R., Martin, I., Quinn, P.J., Tyurin, V.A., Tyurina, Y.Y., Yalowich, J.C. Direct evidence for recycling of myeloperoxidase-catalyzed phenoxyl radicals of a vitamin E homologue, 2,2,5,7,8-pentamethyl-6-hydroxy chromane, by ascorbate/dihydrolipoate in living HL-60 cells. *Biochim. Biophys. Acta*, 1620, 72-84, 2003
158. Kagan, V.E., Borisenko, G.G., Serinkan, B.F., Tyurina, Y.Y., Tyurin, V.A., Jiang, J., Liu, S.X., Shvedova, A.A., Fabisiak, J.P., Uthaisang, W., Fadeel, B. Appetizing rancidity of apoptotic cells for macrophages: oxidation/externalization/recognition of phosphatidylserine. *Amer. J. Physiol. Lung. Cel.Mol.Physiol.* 285(1):L1-L17, 2003
159. Gryzunov, Y.A., Arroyo, A., Vigne, J.-L., Zhao, Q., Tyurin, V.A., Hubel, C.A., Gandley, R.E., Vladmirov, Y.A., Taylor, R.N., Kagan, V.E. Binding of Fatty Acids Facilitates Oxidation of Cysteine-34 and Converts Copper-Albumin Complexes from Antioxidants to Prooxidants. *Arch. Biochem. Biophys.*, 413(1):53-66, 2003
160. Borisenko, G. G., Matura, T., Liu, S.X., Tyurin, V.A., Jiang, J, Serinkan, F.B., Kagan, V.E. Macrophage recognition of externalized phosphatidylserine and phagocytosis of apoptotic Jurkat cells – existence of a threshold. *Arch. Biochem. Biophys.*, 413(1):41-52, 2003
161. Fadeel, B., Kagan, V.E. Apoptosis and macrophage clearance of neutrophils: regulation by reactive oxygen species. *Redox Reports*, 8: 143-150, 2003.
162. Greenberger, JS, Epperly, MW, Gretton, J, Jefferson, M, Nie, S, Bernarding, M, Kagan, V, Guo, HL. Radioprotective gene therapy. *Curr Gene Ther.* 3(3):183-195, 2003
163. Bello, RI, Kagan, VE, Tyurin V, Navarro, F, Alcain, FJ, Villalba, JM. Regeneration of lipophilic antioxidants by NAD(P)H:quinone oxidoreductase 1. *Protoplasma*, 129-135, 2003

164. Ray P, Chen L, Tyurin VA, Kagan VE, Witzman FA. Proteomic and inducible transgenic approaches to study disease processes. *Am. J. Resp. Cell Mol. Biol.* 29, S42-46, 2003
165. Jiang J, Serinkan BF, Tyurina YY, Borisenko GG, Mi Z, Robbins PR, Kagan VE. Transfection of Jurkat Cells with Pro-Apoptotic Peptide DP1 Causes Selective Peroxidation and Externalization of Phosphatidylserine Associated with Release of Cytochrome *c* from Mitochondria. *Free Radical Biol. Med.*, 35, 814-825, 2003
166. Matura T, Kai M, Yamada K, Shvedova AA, Kagan VE. Fine-tuning phagocytic clearance of apoptotic cells by phosphatidylserine oxidation. *J. Clin.Biochem.Nutr.*, 17, 243-251, 2003
167. Epperly MW, Osipov AN, Martin J, Kawai KK, Borisenko GG, Jefferson M, Bernarding M, Greenberger JS, Kagan VE. Ascorbate as a "Redox-Sensor" and Protector Against Irradiation-Induced Oxidative Stress in 32D cl 3 Hematopoietic Cells and Subclones Overexpressing Human Manganese Superoxide Dismutase. *Int J Radiat Oncol Biol Phys.*, 58: 851-861, 2004
168. Y.Y.Tyurina, B. F. Serinkan, V.A Tyurin, V. Kini, J.C. Yalowich, A.J. Schroit. B. Fadeel, and V.E. Kagan. Lipid antioxidant, etoposide, inhibits phosphatidylserine externalization and macrophage clearance of apoptotic cells by preventing phosphatidylserine oxidation. *J. Biol. Chem.* 279: 6056-6064, 2004
169. Borisenko GG, Everson A., Kagan VE., Fadeel, B. "Milk fat globule epidermal growth factor 8 (MFG-E8) binds to oxidized phosphatidylserine: implications for macrophage clearance of apoptotic cells. *Cell Death Different.* 11(8): 943-5, 2004
170. Matura, T., Kai, M., Jiang, J., Babu, H., Kini, V., Kusumoto, C., Yamada, K., Kagan, V.E. Endogenously generated hydrogen peroxide is required for execution of melphalan-induced apoptosis as well as oxidation and externalization of phosphatidylserine. *Chem Res. Toxicol.*, 17: 685-696, 2004
171. Schor NF, Kagan VE, Liang Y, Yan Ch, Tyurina Y, Tyurin V, Nylander KD. Exploiting oxidative stress and signaling in chemotherapy of resistant neoplasms. *Biochemistry (Mosc).* 69: 38-44, 2004.
172. Serinkan BF, Tyurina YY, Babu H, Djukic M, Quinn PJ, Schroit A, Kagan VE. Vitamin E Inhibits Anti-Fas-Induced Phosphatidylserine Oxidation but Does Not Affect Its Externalization During Apoptosis in Jurkat T Cells and Their Phagocytosis by J774A.1 Macrophages. *Antioxid Redox Signal.* 6: 227-236, 2004
173. Tyurina YY, Kawai K, Tyurin VA, Liu SX, Kagan VE, Fabisiak JP. The plasma membrane is the site of selective phosphatidylserine oxidation during apoptosis: role of cytochrome C. *Antioxid Redox Signal.* 6: 209-225, 2004
174. Forsberg AJ, Kagan VE, Schroit AJ. Thiol oxidation enforces phosphatidylserine externalization in apoptosis-sensitive and -resistant cells through a deltapسيم/cytochrome C release-dependent mechanism. *Antioxid Redox Signal.* 6: 203-208, 2004
175. Kagan VE, Quinn PJ. Toward oxidative lipidomics of cell signaling. *Antioxid Redox Signal.* 6: 199-202, 2004
176. Borisenko GG, Martin I, Zhao Q, Amoscato AA, Tyurina YY, Kagan VE. Glutathione propagates oxidative stress triggered by myeloperoxidase in HL-60 cells. Evidence for glutathionyl radicals induced peroxidation of phospholipids and cytotoxicity. *J Biol Chem.*, 279(22): 23453-62, 2004

177. Jiang, J, Borisenko, GG, Osipov, AN, Martin, I, Tyurina YY, Tyurin VA, Chen, R, Shvedova, AA, Sorokin, A, Graham, SH, Kagan, VE. Arachidonic Acid-induced Carbon-centered Radicals and Phospholipid Peroxidation in Cyclooxygenase-2 Transfected Rat Pheochromocytoma PC-12 Cells. *J. Neurochem.* 90(5):1036-49, 2004
178. Weinberg A, Nylander KD, Yan C, Ma L, Hsia CJ, Tyurin VA, Kagan VE, Schor NF. Prevention of catecholaminergic oxidative toxicity by 4-hydroxy-2,2,6,6-tetramethylpiperidine-1-oxyl and its recycling complex with polynitroxylated albumin, TEMPOL/PNA. *Brain Res.* 1012:13-21, 2004
179. Borisenko, GG, Martin, I, Zhao, Q, Amoscato, AA, and Kagan, VE. Nitroxides scavenge myeloperoxidase-catalyzed thiyl radicals in model systems and in cells. *J. Amer. Chem. Soc.* 126(30): 9221-32, 2004
180. Kagan VE, Borisenko GG, Tyurina YY, Tyurin VA, Jiang J, Potapovich AI, Kini V, Amoscato AA, Fujii Y. Oxidative lipidomics of apoptosis: Redox catalytic interactions of cytochrome C with cardiolipin and phosphatidylserine. *Free Rad. Biol. Med.* 37(12):1963-1985, 2004
181. Tyurina YY, Tyurin VA, Zhao Q, Djukich M, Quinn PJ, Pitt BR, Kagan VE. Oxidation of phosphatidylserine: a mechanism for plasma membrane phospholipid scrambling during apoptosis? *Biochem. Biophys. Res. Comms.*, 324(3):1059-64, 2004.
182. Jiang J, Kini, V, Serinkan B, Borisenko GG, Tyurina YY, Tyurin VA, Kagan VE. Cytochrome c release is required for phosphatidylserine peroxidation during Fas-triggered apoptosis in lung epithelial A549 cells. *Lipids*, 39(11): 1133-42, 2004
183. Gandley RE, Tyurin VA, Huang W, Arroyo A, Daftary A, Harger G, Jiang J, Pitt B, Taylor RN, Hubel CA, Kagan VE. S-Nitroso-Albumin-Mediated Relaxation is Enhanced by Ascorbate and Copper: Effects in Pregnancy and Preeclampsia Plasma. *Hypertension*, 45: 21-27, 2005
184. Bayir H, Kagan VE, Borisenko GG, Tyurina YY, Janesko KL, Vagni VA, Billiar TR, Williams DL, Kochanek PM. Enhanced Oxidative Stress in iNOS Deficient Mice after Traumatic Brain Injury: Support For A Neuroprotective Role of iNOS. *J. Cereb. Flow Metab.*, 25(6):673-84, 2005
185. Fabisiak JP, Borisenko GG, Kagan VE. Quantitative method of measuring phosphatidylserine externalization during apoptosis using electron paramagnetic resonance spectroscopy and annexin-conjugated iron. *Methods Mol Biol.*;291:457-64, 2005
186. Fabisiak JP, Tyurina YY, Tyurin VA, Kagan VE. Quantification of selective phosphatidylserine oxidation during apoptosis. *Methods Mol Biol.* 291:449-56, 2005
- 187 Serinkan . BF, Gambelli F, Potapovich AI, Babu H, Di Giuseppe M, Ortiz LA, Fabisiak JP and Kagan VE. Apoptotic cells quench reactive oxygen and nitrogen species and modulate TNF- α /TGF- β 1 balance in activated macrophages: involvement of phosphatidylserine-dependent and -independent pathways. *Cell Death & Differentiation.* 12(8):1141-1144, 2005
188. Shvedova AA, Kisin ER, Mercer R, Murray AR, Johnson IJ, Potapovich AI, Tyurina YY, Gorelik, O, Arepalli S, Schwegler-Berry D, Hubbs AF, Antonini J, Evans DE, Ku, B-K, Ramsey D, Maynard A, Kagan VE, Castranova V, Baron P. Unusual inflammatory and fibrogenic pulmonary responses to single walled carbon nanotubes in mice. *Amer. J. Physiol: Lung*, 289(5):L698-708, 2005
189. Tyurina YY, Nylander KD, Mirnics ZK, Portugal C, Yan C, Zaccaro C, Saragovi HU, Kagan VE, Schor NF. The intracellular domain of p75^{NTR} as a determinant of cellular reducing potential and response to oxidant stress. *Aging Cell*, 4(4):187-196, 2005

190. Kagan VE, Tyurin VA, Jiang J, Tyurina YY, Ritov VB, Amoscato AA, Osipov AN, Belikova NA, Kapralov AA, Kini V, Vlasova II, Zhao Q, Zou M, Di P, Svistunenko DA, Kurnikov IV, Borisenko GG. Cytochrome c acts as a cardiolipin oxygenase required for release of pro-apoptotic factors. *Nature Chem Biol.*, 1, 223-232, 2005
191. Yishak, AA, Costacou, T, Virella, G, Zgibor, J, Fried, L, Walsh, M, Evans, RW, Lopes-Virella, M, Kagan, VE, Otvos, J, Orchard, TJ Novel predictors of overt nephropathy in subjects with type 1 diabetes. A nested case control study from the Pittsburgh Epidemiology of Diabetes Complications (EDC) cohort. *Nephrol. Dialysis Transplant*, 21(1):93-100, 2005
192. Mi Z, Hong B, Mirnics ZK, Tyurina YY, Kagan VE, Liang Y, Schor NF. Bcl-2-mediated potentiation of neocarzinostatin-induced apoptosis: requirement for caspase-3, sulfhydryl groups, and cleavable Bcl-2. *Cancer Chemother. Pharmacol.* 57(3):357-67, 2005
193. Wipf P, Xiao J, Jiang J, Belikova NA, Tyurin VA, Fink MP, and Kagan VE. Mitochondrial Targeting of Selective Electron Scavengers: Synthesis and Biological Analysis of Hemigramicidin-TEMPO Conjugates. *J. Am. Chem. Soc.* 127(36):12460-12461, 2005
194. Liang Q, Smith AD, Pan S, Tyurin VA, Kagan VE, Hastings TG, Schor NF. Neuroprotective effects of TEMPOL in central and peripheral nervous system models of Parkinson's disease. *Biochem Pharmacol.*, 0(9):1371-81, 2005
195. Stoyanovsky DA, Tyurina YY, Tyurin VA, Anand D, Mandavia DN, Gius D, Ivanova J, Pitt B, Billiar TR, Kagan VE. Thioredoxin and Lipoic Acid Catalyze the Denitrosation of Low Molecular Weight and Protein S-Nitrosothiols. *J. Am. Chem. Soc.* 127 (45): 15815-1582, 2005
196. St Croix CM, Leelavaninchkul K, Watkins SC, Kagan VE, Pitt BR. Nitric oxide and zinc homeostasis in acute lung injury. *Proc Am Thorac Soc.* 2(3): 236-242, 2005
197. Epperly MW, Tyurina YY, Nie S, Niu YY, Zhang X, Kagan V, Greenberger JS. MnSOD-plasmid liposome gene therapy decreases ionizing irradiation-induced lipid peroxidation of the esophagus. *In Vivo.* 19(6): 997-1004, 2005
198. Gong H, Singh SV, Singh SP, Mu Y, Lee YJ, Saini SPP, Toma D, Ren S, Kagan CE, Day BW, Zimniak P, and Xie W, Orphan nuclear receptor PXR sensitizes oxidative stress responses in transgenic mice and cancerous cells. *Molec. Endocrinol.* 20(2):279-90, 2006
199. Costacou T, Virella G, Fried L, Zgibor J, Evans RW, Kagan VE, and Orchard TV. Antioxidants and coronary artery disease among individuals with type 1 diabetes: findings from the Pittsburgh Epidemiology of Diabetes Complications (EDC) Study. *J. Diabet. Complic.*, 20(6):387-94, 2006
200. Tyurina YY, Kapralov AA, Jiang J, Borisenko GG, Potapovich AI, Sorokin A, Kochanek PM, Graham SH, Schor NF, Kagan VE. Oxidation and cytotoxicity of 6-OHDA is mediated by reactive intermediates of COX-2 overexpressed in PC12 cells. *Brain Res.*, 1093(1):71-82, 2006
201. H. Bayir, B. Fadeel, M.J. Palladino, E. Witasp, I. V. Kurnikov, Y.Y. Tyurina, V.A. Tyurin, A. A. Amoscato, J. Jiang, P. M. Kochanek, S.T. DeKosky, J. S. Greenberger, A.A. Shvedova, V.E. Kagan. Apoptotic interactions of cytochrome c: redox flirting with anionic phospholipids within and outside of mitochondria. *Biochim. Biophys. Acta – Bioenergetics*, 1757(5-6):648-59, 2006

202. Ramirez RJ, Hubel CA, Novak J, Dicianno JR, Kagan VE, Gandley RE. Moderate Ascorbate Deficiency Increases Myogenic Tone of Arteries from Pregnant but Not Virgin Ascorbate-Dependent Rats. *Hypertension*, 47(3):454-60, 2006
203. Kagan VE, Tyurina YY, Tyurin VA, Konduru NV, Potapovich AI, Osipov AN, Kisin ER, Schwegler-Berry D, Mercer R, Castranova V, Shvedova AA. Direct and indirect effects of single walled carbon nanotubes on RAW 264.7 macrophages: Role of iron. *Toxicol Lett.* 165(1):88-100. 2006
204. Vlasova II, Tyurin VA, Kapralov AA, Kurnikov IV, Osipov AN, Potapovich MV, Stoyanovsky DA, Kagan VE. Nitric oxide inhibits peroxidase activity of cytochrome c/cardiolipin complex and blocks cardiolipin oxidation. *J Biol Chem.* 281(21):14554-62, 2006
205. Belikova NA, Vladimirov YA, Osipov AN, Kapralov AA, Tyurin VA, Potapovich MV, Basova LV, Peterson J, Kurnikov IV, Kagan VE. Peroxidase Activity and Structural Transitions of Cytochrome c Bound to Cardiolipin-Containing Membranes. *Biochemistry*, 45(15):4998-5009, 2006
206. Belikova NA, Jiang J, Tyurina YY, Zhao Q, Epperly MW, Greenberger J, Kagan VE. Cardiolipin-Specific Peroxidase Reactions of Cytochrome c in Mitochondria During Irradiation-Induced Apoptosis. *Int J Radiat Oncol Biol Phys.*, 1;69(1):176-186, 2007
207. Bayir H, Tyurin VA, Tyurina YY, Viner R, Ritov Vm Amoscato AA, Zhao Q, Zhang XJ, Janesko Feldman KL, Alexander H, Basova LV, Clark RS, Kochanek PM, Kagan VE. Selective early cardiolipin peroxidation after traumatic brain injury: an oxidative lipidomics analysis. *Ann Neurol.*, 62(2):154-69, 2007
208. Kagan VE, Jiang J, Bayir H, Stoyanovsky DA. Targeting nitroxides to mitochondria: location, location, and...concentration: highlight commentary on "Mitochondria superoxide Dismutase mimetic inhibits peroxide-induced oxidative damage and apoptosis: role of mitochondrial superoxide." *Free Radic Biol Med.*, 1;43(3):348:50, 2007
209. Fink MP, Macias CA, Xiao J, Tyurina YY, Jiang J, Belikova N, Delude RL, Greenberger JS, Kagan VE, Wipf P. Hemigramicidin-TEMPO conjugates: Novel mitochondria-targeted anti-oxidants. *Biochem Pharmacol.*, 15;74(6):801-9, 2007
210. Shvedova AA, Kisin ER, Murray AR, Gorelik O, Arepalli S, Castranova V, Young SH, Gao F, Tyurina YY, Oury TD, Kagan, VE. Vitamin E deficiency enhances pulmonary inflammatory response and oxidative stress induced by single-walled carbon nanotubes in C57BL/6 mice. *Toxicol Appl Pharmacol.*, 15;221(3):339-48, 2007
211. Bayir H, Kagan VE, Clark RS, Janesko-Feldman K, Rafikov R, Huang Z, Zhang X, Vagni V, Billiar TR, Kochanek PM. Neuronal NOS-mediated nitration and inactivation of manganese superoxide Dismutase in brain after experimental and human brain injury. *J Neurochem.*, 101(1):168-81, 2007
212. Basova LV, Kurnikov IV, Wang L, Ritov VB, Belikova NA, Vlasova II, Pacheco AA, Winnica DE, Peterson J, Bayir H, Waldeck DH, Kagan VE. Cardiolipin switch in mitochondria: shutting off the reduction of cytochrome c and turning on the peroxidase activity, *Biochemistry*, 46(11):3423-34, 2007
213. Belikova NA, Jiang J, Tyurina YY, Zhao Q, Epperly MW, Greenberger J, Kagan VE. Cardiolipin-Specific Peroxidase Reactions of Cytochrome c in Mitochondria During Irradiation-Induced Apoptosis. *Int J Radiat Oncol Biol Phys.*, 1;69(1):176-186, 2007

214. Bayir H, Tyurin VA, Tyurina YY, Viner R, Ritov V, Amoscato AA, Zhao Q, Zhang XJ, Janesko-Feldman KL, Alexander H, Basova LV, Clark RS, Kochanek PM, Kagan VE. Selective early cardiolipin peroxidation after traumatic brain injury: an oxidative lipidomics analysis. *Ann Neurol.*, 8;62(2):154-169, 2007.
215. Fink MP, Macias CA, Xiao J, Tyurina YY, Jiang J, Belikova N, Delude RL, Greenberger JS, Kagan VE, Wipf P. Hemigramicidin-TEMPO conjugates: Novel mitochondria-targeted antioxidants. *Biochem Pharmacol.*, 15;74(6):801-9, 2007
216. Macias CA, Chiao JW, Xiao J, Arora DS, Tyurina YY, Delude RL, Wipf P, Kagan VE, Fink MP. Treatment with a novel hemigramicidin-TEMP conjugate prolongs survival in a rat model of lethal hemorrhagic shock. *Ann Surg.*, 245(2):305-14, 2007
217. Tyurina YY, Basova LV, Konduru NV, Tyurin VA, Potapovich AI, Cai P, Bayir H, Stoyanovsky D, Pitt BR, Shvedova AA, Fadeel B, Kagan VE. Nitrosative stress inhibits the aminophospholipid translocase resulting in phosphatidylserine externalization and macrophage engulfment: implications for the resolution of inflammation. *J Biol Chem.*, 16:282(11):8498-509, 2007
218. Jiang J, Kurnikov I, Belikova NA, Xiao J, Zhao Q, Amoscato AA, Braslau R, Studer A, Fink MP, Greenberger JS, Wipf P, Kagan VE. Structural requirements for optimized delivery, inhibition of oxidative stress, and antiapoptotic activity of targeted nitroxides. *J Pharmacol. Exp Ther.*, 320(3):1050-60, 2007
219. Tyurin VA, Tyurina YY, Osipov AN, Belikova NA, Basova LV, Kapralov AA, Bayir H, Kagan VE. Interactions of cardiolipin and lyso-cardiolipins with Cytochrome c and tBid: conflict or assistance in apoptosis. *Cell Death Differ.*, 14(4):872-5, 2007
220. Fink MP, Macias CA, Xiao J, Tyurina YY, Delude RL, Greenberger JS, Kagan VE, Wipf P. Hemigramicidin-TEMPO conjugates: novel mitochondria-targeted antioxidants. *Crit Care Med.* 35(9 Suppl):S461-7, 2007
221. Belikova NA, Jiang J, Tyurina YY, Zhao Q, Epperly MW, Greenberger J, Kagan VE. Cardiolipin-Specific Peroxidase Reactions of Cytochrome c in Mitochondria During Irradiation-Induced Apoptosis. *Int J Radiat Oncol Biol Phys.* 1:69(1): 176-186, 2007
222. Bengt F, Kagan VE, Krug K, Shvedova A, Svartengren M, Tran L, Wiklund L. There's plenty of room at the forum: Potential risks and safety assessment of engineered nanomaterials. *Nanotoxicology*, 1(2): 73-84, 2007
223. Tyurina YY, Tyurin VA, Epperly MW, Greenberger JS, Kagan VE. Oxidative lipidomics of gamma-irradiation-induced intestinal injury. *Free Radic Biol Med*, 44(3):299-314, 2007
224. Shvedova AA, Fabisiak JP, Kisin ER, Murray AR, Roberts JR, Tyurina YY, Antonini JM, Feng WH, Kommineni C, Reynolds J, Barchowsky A, Castranova V, Kagan VE. Sequential Exposure to Carbon Nanotubes and Bacteria Enhances Pulmonary Inflammation and Infectivity. *Am J Respir Cell Mol Biol.* 38(5):579-90, 2007
225. Kisin ER, Murray AR, Keane MJ, Shi XC, Schwegler-Berry D, Gorelik O, Arepalli S, Castranova V, Wallace WE, Kagan VE, Shvedova AA. Single-walled carbon nanotubes: geno- and cytotoxic effects in lung fibroblast V79 cells. *J Toxicol Environ Health A.* 70(24):2071-9, 2007

226. Kapralov AA, Kurnikov IV, Vlasova II, Belikova NA, Tyurin VA, Basova LV, Zhao Q, Tyurina YY, Jiang J, Bayir H, Vladimirov YA, Kagan VE. The hierarchy of structural transitions induced in cytochrome c by anionic phospholipids determines its peroxidase activation and selective peroxidation during apoptosis in cells. *Biochemistry*, 46(49):14232-44, 2007
227. Jiang J, Huang Z, Zhao Q, Feng W, Belikova NA, Kagan VE. Interplay between bax, reactive oxygen species production, and cardiolipin oxidation during apoptosis. *Biochem Biophys Res Commun.*, 368(1):145-50, 2008
228. Hoye AT, Davoren JE, Wipf P, Fink MP, Kagan VE. Targeting mitochondria. *Acc Chem Res.*, 41(1):87-97, 2008
229. Huang Z, Jiang J, Tyurin VA, Zhao Q, Mnuskin A, Ren J, Belikova NA, Feng W, Kurnikov IV, Kagan VE. Cardiolipin deficiency leads to decreased cardiolipin peroxidation and increased resistance of cells to apoptosis. *Free Radic Biol Med*, 44(11):1935-44, 2008
230. Bayir H, Kagan VE. Bench-to-bedside review: Mitochondrial injury, oxidative stress and apoptosis—there is nothing more practical than a good theory. *Crit Care*, 12(1):206, 2008
231. Jiang J, Belikova NA, Hoye AT, Zhao Q, Epperly NW, Greenberger JS, Wipf P, Kagan VE. A mitochondria-targeted nitroxide/Hemigranicidin S conjugate protects mouse embryonic cells against gamma irradiation. *Int J Radiat Oncol Biol Phys*, 1;70(3):816-25, 2008
232. Stoyanovsky DA, Vlasova II, Belikova NA, Kapralov A, Tyurin V, Kagan VE. Activation of NO donors in mitochondria: peroxidase metabolism of (2-hydroxyamino-vinyl)-triphenyl-phosphonium by cytochrome c releases NO and protects cells against apoptosis. *FEBS Lett*, 582(5):725-8, 2008
233. Tyurina YY, Tyurin VA, Epperly MW, Greenberger JS, Kagan VE. Oxidative lipidomics of gamma-Irradiation-induced intestinal injury. *Free Radic Biol Med*. 1;44(3):299-314, 2008
234. Tyurin VA, Tyurina YY, Feng W, Mnuskin A, Jiang J, Tang M, Zhang X, Zhao Q, Kochanek PM, Clark RS, Bayir H, Kagan VE. Mass-spectrometric characterization of phospholipids and their primary peroxidation products in Rat cortical neurons during staurosporine-induced apoptosis. *J Neurochem*, 107(6):1614-33, 2008
235. Borisenko GG, Kapralov AA, Tyurin VA, Maeda A, Stoyanovsky DA, Kagan VE. Molecular design of new inhibitors of peroxidase activity of cytochrome c/cardiolipin complexes: fluorescent oxadiazole-derivatized cardiolipin. *Biochemistry*, 47(51):13699-710. 2008
236. Du L, Hickey RW, Bayir H, Watkins SC, Tyurin VA, Guo F, Kochanek PM, Jenkins LW, Ren J, Gibson G, Chu CT, Kagan VE, Clark RS. Starving Neurons Show Sex Difference in Autophagy. *J Biol Chem*, 284(4):2383-2396, 2008
237. Jikaw S, Watas E, Zhang S, Kagan VE, Fadeel B. Induction of caspase-and reactive oxygen species-independent phosphatidylserine externalization in primary human neutrophils: role in macrophage recognition and engulfment. *J Leukoc Biol*, 85(3):427-37, 2008
238. Shvedova AA, Kisin ER, Porter D, Schulte P, Kagan VE, Fadeel B, Castranova V. Mechanisms of pulmonary toxicity and medical applications of carbon nanotubes: Two faces of Janus? *Pharmacol Ther*. 121(2):192-204, 2008

239. Maki RA, Tyurin VA, Lyon RC, Hamilton RL, Dekosky ST, Kagan VE, Reynolds WF. Aberrant expression of myeloperoxidase in astrocytes promotes phospholipid oxidation and memory deficits in a mouse model of Alzheimer's Disease. *J Biol Chem*, 284(5):3158-69, 2008
240. Kagan VE, Bayir H, Stoyanovsky D, Borisenko GG, Tyurina YY, Wipf P, Atkinson J, Greenberger JS, Chapkin RS, Belikova NA. Mitochondria-targeted disruptors and inhibitors of cytochrome c/cardiolipin peroxidase Complexes: A new strategy in anti-apoptotic drug discovery. *Mol Nutr Food Res*, 53(1):104-114, 2009
241. Bayir H, Adelson PD, Wisniewski SR, Shore P, Lai Y, Brown D, Janesko-Feldman KL, Kagan VE, Kochanek PK. Therapeutic hypothermia preserves antioxidant defenses after severe traumatic brain injury in infants and children. *Crit Care med*, 37(4):1536 2009
242. Konduru NV, Tyurina YY, Feng W, Basova LV, Belikova NA, Bayir H, Clark K, Rubin M, Stolz D, Vallhov H, Scheynius A, Witasp E, Fadeel B, Kichambare PD, Star A, Kisin ER, Murray AR, Shvedova AA, Kagan VE. Phosphatidylserine targets single-walled carbon nanotubes to professional phagocytes in vitro and in vivo. *PLoS ONE*, 4(2):e4398, 2009
243. Godoy LC, Muñoz-Pinedo C, Castro L, Cardaci S, Schonhoff CM, King M, Tórtora V, Marin M, Miao Q, Jiang JF, Kapralov A, Jemmerson R, Silkstone GG, Patel JN, Evans JE, Wilson MT, Green DR, Kagan VE, Radi R, Mannick JB. Disruption of the M80-Fe ligation stimulates the translocation of cytochrome c To the cytoplasm and nucleus in nonapoptotic cells. *Proc Natl Acad Sci USA*, 106(8):2653-8, 2009
244. Murray AR, Kisina E, Leonard SS, Young SH, Kommineni C, Kagan VE, Castranova V, Shvedova AA. Oxidative stress and inflammatory response in dermal toxicity of single-walled carbon nanotubes. *J Biol Chem*, 257(3): 161-71, 2009
245. Bayir H, Kapralov AA, Jiang J, Huang Z, Tyurina YY, Tyurin VA, Zhao Q, Belikova NA, Vlasova II, Maeda A, Zhu J, Na HM, Mastroberardino PG, Sparvero LJ, Amoscato AA, Chu CT, Greenamyre JT, Kagan VE. Peroxidase Mechanism of lipid dependent cross-linking of synuclein with cytochrome c: Protection against apoptosis versus delayed oxidative stress in Parkinson's disease. *J Biol Chem*, 284(23): 15951-69, 2009
246. Kagan VE, Bayir HA, Belikova NA, Kapralov O, Tyurina YY, Tyurin VA, Jiang J, Stoyanovsky DA, Wipf P, Kochanek PM, Greenberger JS, Pitt B, Shvedova AA, Borisenko G. Cytochrome c/cardiolipin relations In mitochondria: a kiss of death. *Free Radic Biol Med*, 46(11): 1439-53, 2009
247. Shurin MR, Potapovich AI, Tyurina YY, Tourkova IL, Shurin GV, Kagan VE. Recognition of live phosphatidylserine-labeled tumor cells by dendritic cells: a novel approach to immunotherapy of skin cancer. *Cancer Res*. 15; 69(6):2487-96, 2009
248. Vladimirov VA, Proskurnia EV, Demin EM, Matveeva NS, Lubitskiy OB, Novikov AA, Izmailov DY, Osipov AN, Tikonov VP, Kagan VE. Dihydroquercetin (taxifolin) and other flavonoids as inhibitors of free radical formation at key stages of apoptosis. *Biochemistry (Mosc)*, 74(3): 301-7, 2009
249. Belikova NA, Jiang J, Stoyanovsky DA, Glumac A, Bayir H, Greenberger JS, Kagan VE. Mitochondria-targeted (2-hydroxyamino-vinyl)-triphenyl-phosphonium releases NO, and protects mouse embryonic cells against irradiation-induced apoptosis. *FEBS Lett*, 583(12): 1945-50, 2009

250. Witasp DS, Jitkaew S, Tyurina Y, Kagan VE, Ahlin A, Palmblad J, Fadeel B. Involvement of a functional NADPH oxidase in neutrophils and macrophages during programmed cell clearance: implications for chronic granulomatous disease. *Am J Physiol Cell Physiol*, 297(3):C621-31, 2009
251. Tyurin A, Tyurina YY, Jung MY, Tungekar MA, Wasserloos KJ, Bayir H, Greenberger JS, Kochanek PM, Shvedova AA, Pitt B, Kagan VE. Mass-spectrometric analysis of hydroperoxy-and hydroxyl-derivatives of cardiolipin and phosphatidylserine in cells and tissues induced by pro-apoptotic and pro-inflammatory stimuli. *J Chromatogr B Analyt Technol Biomed Life Sci*. 877(26):2863-72, 2009
252. Witasp E, Shvedova AA, Kagan VE, Fadeel B. Single-walled carbon nanotubes impair human macrophage engulfment of apoptotic cell corpses. *Inhal Toxicol*, (S1):131-136, 2009
253. Jiang J, Stoyanovsky DA, Belikova NA, Tyurina YY, Zhao Q, Tungekar MA, Kapralova V, Huang Z, Mintz AH, Greenberger JL, Kagan VE. A mitochondria-targeted Triphenylphosphonium-conjugated nitroxide functions as a Radioprotector/mitigator. *Radiat Res*, 172(6):706-17, 2009
254. Allen BL, Kotchey GP, Chen Y, Yanamala NV, Klein-Seetharaman J, Kagan VE, Star A. Mechanistic Investigations of horseradish peroxidase-catalyzed degradation of single-walled carbon nanotubes. *J Am Chem Soc*, 131(47):17194-205, 2009
255. Belikova NA, Glumac A, Rafikov R, Jiang J, Greenberger JS, Kagan VE, Bayir H. Radioprotection by short-term oxidative precondition: role of manganese superoxide dismutase. *FEBS Lett*, 583(21):3437-42, 2009
256. Tyurina YY, Tyurin VA, Kapralova VI, Amoscato AA, Epperly MW, Greenberger JS, Kagan VE. Mass-Spectrometric characterization of phospholipids and their hydroperoxide derivatives in vivo: effects of total body irradiation. *Methods Mol Biol*, 580:153-83, 2009
257. Kapralov A, Vlasova II, Feng W, Maeda A, Walson K, Tyurin VA, Huang Z, Aneja RK, Carcillo J, Bayir H, Kagan VE. Peroxidase activity of hemoglobin-haptoglobin complexes: covalent aggregation and oxidative stress in plasma and macrophages. *J Biol Chem*, 284(44):30395-407, 2009
258. Kagan VE, Wipf P, Stoyanovsky D, Greenberger JS, Borisenko G, Belikova NA, Yanamala N, Samhan Arias AK, Tyurina YY, Ji J, Klein-Seetharaman J, Pitt BR, Shvedova AA, Bayir H. Mitochondrial targeting of electron scavenging antioxidants: Regulation of selective oxidation vs random chain reactions. *Adv Drug Deliv Rev*, 61(14):1375-85, 2009
259. Belikova NA, Tyurina YY, Borisenko G, Tyurin V, Samhan Arias AK, Yanamala N, Furtmüller PG, Klein-Seetharaman, Kagan VE. Heterolytic reduction of fatty acid hydroperoxides by cytochrome c/Cardiolipin complexes: antioxidant functions in mitochondria. *J Am Chem Soc*, 131(32):11288-9, 2009
260. Sengupta R, Billiar TR, Kagan VE, Stoyanovsky DA. Nitric oxide and thioredoxin type 1 modulate the activity of caspase 8 in HepG2 cells. *Biochem Biophys Res Commun*. 391(1):1127-30, 2009
261. Li W, Wu S, Ahmad M, Jiang J, Liu H, Nagayama T, Rose ME, Tyurin VA, Tyurina YY, Borisenko GG, Belikova N, Chen J, Kagan VE, Graham SH. The Cyclooxygenase Site, But Not the Peroxidase Site of Cyclooxygenase-2 is required for Neurotoxicity in Hypoxic and Ischemic Injury. *J Neurochem*, 113(4):965-77, 2010

262. Hilmi IA, Peng Z, Planinsic RM, Damian D, Dai F, Tyurina YY, Kagan VE, Kellum JA. N-acetylcysteine does not prevent hepatorenal ischaemia-reperfusion injury in patients undergoing orthotopic liver transplantation. *Nephrol Dial Transplant*, 25(7):2328-33, 2010. PMID: 20179007
263. Shvedova AA, Kagan VE. The role of Nanotoxicology in realizing the 'helping without harm' paradigm of nanomedicine: lessons from studies of pulmonary effects of single-walled carbon nanotubes. *J Intern Med*, 267(1):106-18, 2010. PMID:20059647
264. Shvedova AA, Kagan VE, Fadeel B. Close encounters of the small kind: adverse effects of man-made materials interfacing with the nano-cosmos of biological systems. *Annu Rev Pharmacol Toxicol*. 20:63-88, 2010, Review
265. Tyurin VA, Tyurina YY, Ritov VB, Lysytsya A, Amoscato AA, Kochanek PM, Hamilton R, Dekosky ST, Greenberger JS, Bayir H, Kagan VE. Oxidative lipidomics of apoptosis: quantitative assessment of phospholipid hydroperoxides in cells and tissues. *Methods Mol Biol*, 610:353-74, 2010
266. Kagan VE, Konduru NV, Feng W, Allen BL, Conroy J, Volkov Y, Vlasova II, Belikova NA, Yanamala N, Kapralov A, Tyurina YY, Shi J, Kisin ER, Murray AR, Franks J, Stolz D, Gou P, Klein-Seetharaman J, Fadeel B, Star A, Shvedova AA. Carbon nanotubes degraded by neutrophil myeloperoxidase induce less pulmonary inflammation. *Nat Nanotechnol*. 5(5):354-9, 2010. PMID: 20364135
267. Tyurina YY, Tyurin VA, Kaynar AM, Karpalova VI, Wasserloos K, Li J, Mosher M, Wright L, Wipf P, Watkins S, Pitt BR, Kagan VE. Oxidative lipidomics of hyperoxic acute lung injury: mass spectrometric characterization of cardiolipin and phosphatidylserine peroxidation. *Am J Physiol Lung Cell Mol Physiol*. 299(1):L73-85, 2010. PMID: 20418384
268. Su E, Bell MJ, Wisniewski SR, Adelson PD, Janesko-Feldman KL, Salonia R, Clark RS, Kochanek PM, Kagan VE, Bayir H. α -Synuclein levels are elevated in cerebrospinal fluid following traumatic brain injury infants and children: the effect of therapeutic hypothermia. *Dev Neurosci*, 32(5-6):385-95, 2010. PMID: 21124000.
269. Kotchey GP, Allen BL, Vedala H, Yanamala N, Kapralov AA, Tyurina YY, Klein-Seetharaman J, Kagan VE, Star A. The Enzymatic Oxidation of Graphene Oxide. *ACS Nano*, 5(3):2098-108, 2011. PMID: 21344859
270. Tyurina YY, Tyurin VA, Kapralova VI, Wasserloos K, Mosher M, Epperly MW, Greenberger JS, Pitt BR, Kagan VE. Oxidative Lipidomics of γ -Radiation –Induced Lung Injury: Mass Spectrometric Characterization of Cardiolipin and Phosphatidylserine Peroxidation. *Radiat Res*, 175(5):610-21, 2011. PMID: 21338246
271. Kisin ER, Murray AR, Sargent L, Lowry D, Chirila M, Siegrist KJ, Schwegler-Berry D, Leonard S, Castranova V, Fadeel B, Kagan VE, Shvedova AA. Genotoxicity of carbon nanofibers: Are they potentially more or less dangerous than carbon nanotubes or asbestos? *Toxicol Appl Pharmacol*, 252(1):1-10, 2011. PMID: 213310169
272. Samhan-Arias AK, Tyurina YY, Kagan VE. Lipid antioxidants: free radical scavenging versus regulation of enzymatic lipid peroxidation. *J Clin Biochem Nutr*, 48(1):91-5, 2011. PMID: 21297919

273. Hüttemann M, Pecina P, Rainbolt M, Sanderson TH, Kagan VE, Samavati L, Doan JW, Lee I. The multiple functions of cytochrome c and their regulation in life and death decisions of the mammalian cell: From respiration to apoptosis. *Mitochondrion*, 11(3):369-81, 2011. PMID: 21296189
274. Thambiayya K, Wasserloos KJ, Huang Z, Kagan VE, St. Croix CM, Pitt BR. LPS-Induced decrease in intracellular labile zinc [Zni] contributes to apoptosis in cultured sheep pulmonary artery endothelial cells (SPAEC). *Am J Physiol Lung Cell Mol Physiol*, 300(4):L624-32, 2011. PMID: 21239534
275. Li HH, Xu J, Wasserloos KJ, Li J, Tyurina YY, Kagan VE, Wang X, Chen AF, Liu ZQ, Stoyanovsky D, Pitt BR, Zhang LM. Cytoprotective effects of Albumin, Nitrosated or Reduced in Cultured Rat Pulmonary Vascular Cells. *Am J Physiol Lung Cell Mol Physiol*, 300(4):L526-33, 2011. PMID: 21239532
276. Vlasova II, Feng WH, Goff JP, Giorgianni A, Do D, Gollin SM, Lewis DW, Kagan VE, Yalowich JC. Myeloperoxidase-dependent oxidation of Etoposide in human myeloid progenitor CD34+cells. *Mol Pharmacol*, 79(3):479-87, 2011. PMID: 21097707.
277. Tkach AV, Shurin GV, Shurin MR, Kisin ER, Murray AR, Young SH, Star A, Fadeel B, Kagan VE, Shvedova AA. Direct Effects of Carbon Nanotubes on Dendritic Cells Induce Immune Suppression Upon Pulmonary Exposure. *ACS nano*, 5(7):5755-62, 2011. PMID: 21657201
278. Stoyanovsky DA, Maeda A, Atkins JL, Kagan VE. Assessments of Thiyl Radicals in Biosystems: Difficulties and New Applications. *Anal Chem*, 83(17):6432-8, 2011 PMID: 21591751
279. Kapralov AA, Yanamala N, Tyurina YY, Castro L, Samhan-Arias A, Vladimirov YA, Maeda A, Weitz AA, Peterson J, Mylnikov D, Demicheli V, Tortora V, Klein-Seetharaman J, Radi R, Kagan VE. Topography of tyrosine residues and their involvement in peroxidation of polyunsaturated cardiolipin in cytochrome c/cardiolipin peroxidase complexes. *Biochem Biophys Acta*, 1808(9):2147-55, 2011 PMID: 21550335
280. Rwigema JC, Beck B, Wang W, Doemling A, Epperly MW, Shields D, Goff JP, Franicola D, Dixon T, Frantz MC, Wipf P, Tyurina Y, Kagan VE, Wang H, Greenberger JS. Two strategies for the development of mitochondria-targeted small molecule radiation damage mitigators. *Int J Radiat Oncol Biol Phys*, 80(3):860-8, 2011 PMID: 21493014
281. Tyurin VA, Cao W, Tyurina YY, Gabrilovich DI, Kagan VE. Mass spectrometric characterization of peroxidized and hydrolyzed lipids in plasma and dendritic cells of tumor bearing animals. *Biochem Biophys Res Commun*, 413(1):149-153, 2011 PMID: 21872574
282. Belikova NA, Glumac AL, Kapralova V, Cheikhi A, Tyurina YY, Vagni VA, Kochanek PM, Kagan VE, Bayir H. A high-throughput screening assay of ascorbate in brain samples. *J Neurosci Methods*, 201(1):185-90, 2011 PMID: 21255575
283. Jiang J, Maeda A, Ji J, Baty CJ, Watkins SC, Greenberger JS, Kagan VE. Are mitochondrial reactive oxygen species required for autophagy? *Biochem Biophys Res Commun*, 412(1):55-60, 2011 PMID: 21806968
284. Tyurina YY, Kisin ER, Murray A, Tyurin VA, Kapralova VI, Sparvero LJ, Amoscato AA, Samhan-Aria AK, Swedin L, Lahesmaa R, Fadeel B, Shvedova AA, Kagan VE. Global Phospholipidomics Analysis Reveals Selective Pulmonary Peroxidation Profiles upon Inhalation of Single-Walled Carbon Nanotubes. *ACS Nano*, 5(9):7342-53, 2011 PMID: 21800898

285. Midwinter RG, Maghzal GJ, Dennis JM, Wu BJ, Cai H, Kapralov AA, Belikova NA, Tyurina YY, Dong LF, Khachigian L, Neuzil J, Kagan VE, Stocker R. Succinobucol induces apoptosis in vascular smooth muscle cells. *Free Radic Biol Med*, 52(5):87-9, 2011. PMID: 22203369
286. Kim H, Bernard ME, Epperly MW, Shen H, Amoscato A, Dixon TM, Doemling AS, Li S, Gao X, Wipf P, Wang H, Zhang X, Kagan VE, Greenberger JS. Amelioration of radiation Esophagitis by orally administered p53/Mdm2/Mdm4 inhibitor (BEB55) or GS-nitroxide. *In Vivo*, 25(6):841-8, 2011 PMID: 22021675
287. Atkinson J, Kapralov AA, Yanamala N, Tyurina YY, Amoscato AA, Pearce L, Peterson J, Huang Z, Jiang J, Samhan-Arias AK, Maeda A, Feng W, Wasserloos K, Belikova NA, Tyurin VA, Wang H, Fletcher J, Wang Y, Vlasova II, Klein-Seetharaman J, Stoyanovsky DA, Bayir H, Pitt BR, Epperly MW, Greenberger JS, Kagan VE. A mitochondria-targeted inhibitor of cytochrome c peroxidase mitigates radiation-induced death. *Nat Commun*, 2:497, 2011 doi: 10.1038/ncomms 1499, PMID: 21988913
288. Stoyanovsky DA, Huang Z, Jiang J, Belikova NA, Tyurin V, Epperly MW, Greenberger JS, Bayir H, Kagan VE. A manganese-porphyrin complex decomposes H₂O₂, inhibits apoptosis, and acts as a radiation mitigator in vivo. *ACS Med Chem Lett*. 2(11):814-817, 2011 PMID: 2224778
289. Schlattner U, Tokarsaka-Schlattner M, Ramirez S, Tyurina YY, Amoscato AA, Mohammadsanyi D, Huang Z, Jiang J, Yanamala N, Seffouh A, Boissan M, Epand RF, Epand RM, Klein-Seetharaman J, Lacombe ML, Kagan VE. Dual function of mitochondrial Nm23-H4 in phosphotransfer and intermembrane lipid transfer: a cardiolipin-dependent switch. *J Biol Chem*, 2012 [Epub ahead of print], PMID: 23150663
290. Tyurin VA, Yanamala N, Tyurina YY, Klein-Seetharaman J, Macphee CH, Kagan VE. Specificity of Lipoprotein-Associated Phospholipase A(2) toward Oxidized Phosphatidylserine: Lipid Chromatography-Electrospray Ionization Mass Spectrometry Characterization of Products and Computer Modeling of Interactions. *Biochemistry*, 2012 [Epub ahead of print], PMID: 23148485
291. Hoye AT, Davoren JE, Wipf P, Fink MP, Kagan VE. Correction to targeting mitochondria. *Acc Chem Res*, 45(12):2222, 2012, PMID: 23145896
292. Shvedova AA, Tkach AV, Kisin Er, Khaliullin T, Stanley S, Gutkin DW, Star A, Chen Y, Shurin GV, Shurin MR, Kagan VE. Carbon Nanotubes Enhance Metastatic Growth of Lung Carcinoma via Up-Regulation of Myeloid-Derived Suppressor Cells. *Small*, 2012 [Epub ahead of print], PMID: 22996965
293. Murray AR, Kisin Er, Tkach AV, Yanamala N, Mercer R, Young SH, Fadeel B, Kagan VE, Shvedova AA. Factoring-in agglomeration of carbon nanotubes and nanofibers for better prediction of their toxicity versus asbestos. *Part Fibre Toxicol*, 2012, 9:10. Doi: 10. 1186/1743-8977-9-10. PMID: 22490147
294. Tyurina YY, Tungekar MA, Jung MY, Tyurin VA, Greenberger JS, Stoyanovsky DA, Kagan VE. Mitochondria targeting of non-peroxidizable triphenylphosphonium conjugated oleic acid protects mouse embryonic cells against apoptosis: role of cardiolipin remodeling. *FEBS Lett*, (3):235-41, 2012, PMID: 22210054
295. Ji J, Kline AE, Amoscato A, Samhan-Arias AK, Sparvero LJ, Tyurin VA, Tyurina YY, Fink B, Manole MD, Puccio AM, Okonkwo DO, Cheng JP, Alexander H, Clark RS, Kochanek PM, Wipf P, Kagan VE, Bayir H. Lipidomics identifies cardiolipin oxidation as a mitochondrial target for redox therapy of brain injury. *Nat Neurosci*, 15(10):1407-13, 2012. PMID: 22922784

296. Sparvero LJ, Amoscato A, Dixon CE, Long JB, Kochanek PM, Pitt BR, Bayir H, Kagan VE. Mapping of phospholipids by MALDI imaging (MALDI-MSI): realities and expectations. *Chem Phys Lipids*: 165(5):545-62, 2012. PMID: 22692104
297. Kochev GP, Hasan SA, Kapralov AA, Ha SH, Kim K, Shvedova AA, Kagan VE, Star A. A Natural vanishing act: the enzyme-catalyzed degradation of carbon nanomaterials. *Acc Chem Res*, 45(10):1770-81, 2012. PMID: 22824066
298. Tkach AV, Yanamala N, Stanley S, Shurin MR, Shurin GV, Kisin ER, Murray AR, Pareso S, Khaliullin T, Kotchey GP, Castranova V, Mathur S, Fadeel B, Star A, Kagan VE, Shvedova AA. Graphene Oxide, But Not Fullerenes, Targets Immunoproteasomes and Suppresses Antigen Presentation by Dendritic Cells. *Small*, 288(1):111-21, 2012. PMID: 22887961
299. Murray AR, Kisin E, Inman A, Young SH, Muhammed M, Burks T, Uheida A, Tkach A, Waltz M, Castranova V, Fadeel B, Kagan VE, Riviere JE, Monteiro-Riviere N, Shvedova AA. Oxidative Stress and Dermal Toxicity of Iron Oxide Nanoparticles In Vitro. *Cell Biochem Biophys*, 67(2):461-76, 2012. PMID: 22669739
300. Thambiayya K, Wasserloos K, Kagan VE, Stoyanovsky D, Pitt BR. A critical role for increased labile zinc in reducing sensitivity of cultured sheep pulmonary artery endothelial cells to LPS-induced apoptosis. *Am J Physiol Lung Cell Mol Physiol*, 302(12):L1287-95, 2012. PMID: 22523284.
301. Shvedova AA, Pietroiusti A, Fadeel B, Kagan VE. Mechanisms of carbon nanotube-induced toxicity: focus on oxidative stress. *Toxicol Appl Pharmacol*, 261(2):121-33, 2012. PMID: 22513272
302. Shvedova AA, Kapralov AA, Feng WH, Kisin ER, Murray AR, Mercer RR, St Croix CM, Lang MA, Watkins SC, Konduru NV, Allen BL, Conroy J, Kotchey GP, Mohamed BM, Meade AD, Volkov Y, Star A, Fadeel B, Kagan VE. Impaired clearance and enhanced pulmonary inflammatory/fibrotic response to carbon nanotubes in myeloperoxidase-deficient mice. *PLoS One*. 7(3):e30923, 2012. PMID: 22479306
303. Samhan-Arias AK, Ji J, Demidova OM, Sparvero LJ, Feng W, Tyurin V, Tyurina YY, Epperly MW, Shvedova AA, Greenberger JS, Bayir H, Kagan VE, Amoscato AA. Oxidized phospholipids as biomarkers of tissue and cell damage with a focus on cardiolipin. *Biochim Biophys Acta*. 1818(10):2413-33, 2012. PMID: 22464971
304. Kapralov AA, Feng WH, Amoscato AA, Yanamala N, Balasubramanian K, Winnica DE, Kisin ER, Kotchey GP, Gou P, Sparvero LJ, Ray P, Mallampalli RK, Klein-Seetharaman J, Fadeel B, Star A, Shvedova AA, Kagan VE. Adsorption of surfactant lipids by single-walled carbon nanotubes in mouse lung upon pharyngeal aspiration. *ACS Nano*, 6(5):4147-56, 2012. PMID: 22463369
305. Shi J, Karlsson HL, Johansson K, Gogvadze V, Xiao L, Li J, Burks T, Garcia-Bennett A, Uheida A, Muhammed M, Mathur S, Morgenstern R, Kagan VE, Fadeel B. Microsomal glutathione transferase 1 protects against toxicity induced by silica nanoparticles but not by zinc oxide nanoparticles. *ACS Nano*. 6(3):1925-38, 2012. PMID: 22303956
306. Tyurina YY, Winnica DE, Kapralova VI, Kapralov AA, Tyurin VA, Kagan VE. LC/MS characterization of rotenone induced cardiolipin oxidation in human lymphocytes: Implications for mitochondrial dysfunction associated with Parkinson's disease. *Mol Nutr Food Res*. 57(8):1410-22, 2013. PMID: 23650208

307. Kotchey GP, Gaugler JA, Kapralov AA, Kagan VE, Star A. Effect of antioxidants on enzyme-catalysed biodegradation of carbon nanotubes. *J Mater chem B Mater Biol Med.* 1(3):302-309, 2013. PMID: 23626907
308. Andón FT, Kapralov AA, Yanamala N, Feng W, Baygan A, Chambers BJ, Hultenby K, Ye F, Toprak MS, Brandner BD, Fornara A, Klein-Seetharaman J, Kotchey GP, Star A, Shvedova AA, Fadeel B, Kagan VE. Biodegradation of Single-Walled Carbon Nanotubes by Eosinophil Peroxidase. *Small.* 2013 [Epub ahead of print] PMID: 23447468
309. Schlattner U, Tokarska-Schlattner M, Ramirez S, Tyurina YY, Amoscato AA, Mohammadyani D, Huang Z, Jiang J, Yanamala N, Seffouh A, Boissan M, Epand RF, Epand RM, Klein-Seetharaman J, Lacombe ML, Kagan VE. Dual function of mitochondrial Nm23-H4 protein in phosphotransfer and intermembrane lipid transfer: a cardiolipin-dependent switch. *J Biol Chem,* 288(1):111-21, 2013. PMID: 23150663
310. Yanamala N, Kagan VE, Shvedova AA. Molecular modeling in structural nano-toxicology: Interactions of nano-particles with nano-machinery of cells. *Adv Drug Deliv Rev,*75(15):2070-7, 2013. PMID: 23726945
311. Di YP, Tkach AV, Yanamala N, Stanley S, Gao S, Shurin MR, Kisin ER, Kagan VE, Shvedova A. Dual Acute Pro-Inflammatory and Anti-Fibrotic Pulmonary Effects of SPLUNC1 After Exposure to Carbon Nanotubes. *Am J Respir Cell Mol Biol,* 49(5):759-67, 2013. PMID:23721177
312. Kochanek PM, Dixon CE, Shellington DC, Shin SS, Bayir H, Jackson EK, Kagan VE, Yan HQ, Swauger PV, Parks SA, Ritzel DV, Bauman R, Clark RS, Garman RH, Bandak F, Ling G, Jenkins LW. J Screening of biochemical and molecular mechanisms of secondary injury and repair in the brain after experimental blast-induced traumatic brain injury in rats. *Neurotrauma,* 10(11):920-37, 2013. PMID: 23496248
313. Stoyanovsky, DA, Sparvero LJ, Amoscato AA, He Rr, Watkins S, Pitt BR, Bayir H, Kagan VE. Improved spatial resolution of matrix-assisted laser desorption/ionization imaging of lipids in the brain by alkylated derivatives of 2.5-dihydroxybenzoic acid. *Rapid Commun Mass Spectrom,* 28(4):403-12, 2014. PMID:24497278
314. Tyurin VA, Balasubramanian K, Winica D, Tyurina YY, Vilulina AS, He RR, Kapralov AA, Macphee CH, Kagan VE. Oxidatively modified phosphatidylserines on the surface of apoptotic cells are essential phagocytic 'eat-me' signals: cleavage and inhibition of phagocytosis by Lp-PLA₂. *Cell Death Differ,* 2014 Jan 24. Doi: 10.1038/cdd.2014 [Epub ahead of print]. PMID: 24464221
315. Kagan VE, Epand RM. Deciphering the mysteries of cardiolipins in mitochondria. *Chem Phys Lipids,* 2013 Dec 21. Pii: S0009-3084(13)00169-2. Doi: 10.1016/j.chemphyslip. 2013. 12.007. [Epub ahead of print] PMID: 24365282
316. Kagan VE, Chu CT, Tyurina YY, Cheikhi A, Bayir H. Cardiolipin Asymmetry, oxidation and signaling. *Chem Phys Lipids,* 2013 Dec 1. Pii: S0009-3084(13)00162-X. doi: 10.1016/chemphyslip.2013. 11.010. [Epub ahead of print]

317. Shvedova AA, Yanamala N, Kisin Er, Tkach AV, Murray AR, Hubbs A, Chirila MM, Keohavong P, Sycheva LP, Kagan VE, Castranova V. Long-term effects of carbon containing engineered nanomaterials and asbestos in the lung: one year postexposure comparisons. *Am J Physiol Lung Cell Mol Physiol.* 306(2):L170-82, 2013. PMID: 24213921
318. Yanamala N, Hatfield MK, Farcas MT, Schwegler-Berry D, Hummer JA, Shurin MR., Birch ME, Gutkin DW, Kisin E, Kagan VE, Bugarski AD, Shvedova AA. Biodiesel versus diesel exposure: enhanced pulmonary inflammation, oxidative stress, and differential morphological changes in the mouse lung. *Toxicol Appl Pharmacol*, 272(2):373-83, 2013. PMID: 23886933
319. Chu CT, Ji J, Dagda RK, Jiang JF, Tyurina YY, Kapralov AA, Tyurin VA, Yanamala N, Shrivastava IH, Mohammadyani D, Qiang Wang KZ, Zhu J, Klein-Seetharaman J, Balasubramanian K, Amoscato AA, Borisenko G, Huang Z, Gusdon AM, Cheikhi A, Steer EK, Wang R, Baty C, Watkins S, Bahar I, Hayir H, Kagan VE. Cardiolipin externalization to the outer mitochondrial membrane acts as an elimination signal for mitophagy in neuronal cells. *Nat Cell Biol.* 15(10):1197-205, 2013. PMID: 24036476
320. Rajagopal BS, Edzuma AN, Hough MA, Blundell KL, Kagan VE, Kapralov AA, Fraser LA, Butt JN, Silkstone GG, Wilson MT, Svistunenko DA, Worrall JA. The Hydrogen-peroxide-induced radical behavior in human cytochrome c-phospholipid complexes: implications for the enhanced pro-apoptotic activity of the G41S mutant. *456(3):441-52*, 2013. PMID: 24099549
321. Stoyanovsky DA, Sparvero LJ, Amoscato AA, He RR, Watkins S, Pitt BR, Bayir H, Kagan VE. Improved spatial resolution of matrix-assisted laser desorption/ionization imaging of lipids in the brain by alkylated derivatives of 2,5-dihydroxybenzoic acid. *Rapid Commun Mass Spectrom.* 28(5):403-12, 2014. PMID: 24497278
322. Tyurin VA, Balasubramanian K, Winnica D, Tyurina YY, Vikulina AS, He RR, Kapralov AA, Macphee CH, Kagan VE. Oxidatively modified phosphatidylserines on the surface of apoptotic cells are essential phagocytic 'eat-me' signals: cleavage and inhibition of phagocytosis by Lp-PLA₂. *Cell Death Differ.* 21(5):825-35, 2014 PMID: 24464221
323. Goetzman ES, Alcorn JF, Bharathi SS, Uppala R, McHugh KJ, Kosimider B, Chen R, Zuo YY, Beck ME, McKinney RW, Skilling H, Suhrie KR, Karunanidhi A, Yeasted R, Otsubo C, Ellis B, Tyurina YY, Kagan VE, Mallampalli RK, Vockley J. Long-chain Acyl-CoA dehydrogenase deficiency as a cause of pulmonary surfactant dysfunction. *J Biol Chem*, 289(15):10668-79, 2014 PMID: 24591516
324. Cao W, Ramakrishnan R, Tyurin VA, Veglia F, Condamine T, Amoscato A, Mohammadyani D, Johnson JJ, Min Zhang L, Klein-Seetharaman J, Celis E, Kagan VE, Gabilovich DI. Oxidized Lipids Block Antigen Cross-Presentation by Dendritic Cells in Cancer. *J Immunol.* 2014. [Epub ahead of print] PMID: 24554775
325. Kagan VE, Epand RM. Deciphering the mysteries of cardiolipins in mitochondria. *Chem Phys Lipids.* 179:1-2, 2014. PMID: 24365282
326. Chu CT, Bayir H, Kagan VE. LC3 binds externalized cardiolipin on injured mitochondria to signal mitophagy in neurons: Implications for Parkinson disease. *Autophag.* 10(2):376-378, 2014. PMID: 24351649
327. Tyurina YY, Domingues RM, Tyurin VA, Maciel E, Domingues P, Amoscato AA, Bayir H, Kagan VE. Characterization of cardiolipins and their oxidation products by LC-MS analysis. *Chem Phys Lipids.* 179:3-10, 2014. PMID: 24333544

328. Chen BB, Coon TA, Glasser JR, Zou C, Ellis B, Das T, McKelvey AC, Rajbhandari S, Lear T, Kamga C, Shiva S, Li C, Pilewski JM, Callio J, Chu CT, Ray A, Ray P, Tyurina YY, Kagan VE, Mallampalli RK. E3 Ligase Subunit Fbxo15 and PINK1 Kinase Regulate Cardiolipin Synthase 1 Stability and Mitochondrial Function in Pneumonia. *Cell Rep.* [Epub ahead of print], 2014. PMID:24703837
329. Jiang J, Bakan A, Kapralov AA, Ishara Silva K, Huang Z, Amoscato AA, Peterson J, Krishna Garapati V, Saxena S, Bayir H, Atkinson J, Bahar I, Kagan VE. Designing inhibitors of cytochrome c/cardiolipin peroxidase complexes: mitochondria-targeted imidazole-substituted fatty acids. *Free Radic Biol Med.* 71C:221-230, 2014. PMID: 24631490
330. Fabisiak JP, Borisenko GG, Kagan VE. Quantitative Method of Measuring Phosphatidylserine Externalization During Apoptosis Using Electron Paramagnetic Resonance (EPR) Spectroscopy and Annexin-Conjugated Iron. *Methods Mol Bio.* 1105:613-21, 2014. PMID: 24623356
331. Fabisiak JP, Tyurina YY, Tyurin VA, Kagan VE. Quantification of selective phosphatidylserine oxidation during apoptosis. *Methods Mol Bio.* 1105:603-11, 2014. PMID: 2462355
332. Fazzi F, Njah J, Di Giuseppe M, Winnica DE, Go K, Sala E, St Croix CM, Watkins SC, Tyurin VA, Phinney DG, Fattman CL, Leikauf GD, Kagan VE, Ortiz LA. TNFR1/Phox Interaction and TNFR1 Mitochondrial Translocation Thwart Silica-Induced Pulmonary Fibrosis. *J Immunol.* 192(9):3837-46, 2014. PMID: 24623132
333. Tyurina YY, Poloyac SM, Tyurin VA, Kapralov AA, Jiang J, Anthonymuthu TS, Kapralova VI, Vikulina AS, Jung MY, Epperly MW, Mohammadyani D, Klein-Seetharaman J, Jackson TC, Kochanek PM, Pitt BR, Greenberger JS, Vladimirov VA, Bayir H, Kagan VE. A mitochondrial pathway for biosynthesis of lipid mediators. *Nat chem.* 6(6):542-52, 2014. PMID: 24848241
334. Shurin MR, Yanamala N, Kisin ER, Tkach AV, Shurin GV, Murray AR, Leonard HD, Reynolds S, Gutkin DW, Star A, Fadeel B, Savolainen K, Kagan VE, Shvedova AA. Graphene Oxide Attenuates Th2-Type Immune Responses, but Augments Airway Remodeling and Hyperresponsiveness in a Murine Model of Asthma. *ACS Nanop.* [Epub ahead of print]. 2014. PMID: 24847914

INVITED CHAPTERS IN BOOKS:

1. Arkhipenko, Y.V., Kagan, V.E. and Meerson, F. Z.: Mechanisms of heart sarcoplasmic reticulum damage under stress. In: *Cardiac Adaptation to Hemodynamic Overload, Training and Stress.* R. Jacob, R.W. Gulch, G. Kissling, Eds., Dr. Dietrich Steinkopff Verlag, Darmstadt, 258-264, 1983.
2. Kagan, V.E., Savov, V.M., Serbinova, E.A., Osipov, A.N., Skrypin, V.I., Evstigneeva, R.P. and Stoytchev, T.S.: Effects of alpha-tocopherol derivatives with different chain length on in vitro lipid peroxidation in liver microsomes. In: *Free Radicals, Oxidant Stress and Drug Action,* C. Rice-Evans, Ed., Richelieu Press, London, 425-441, 1987.
3. Kagan, V.E., Serbinova, E.A., Bakalova, R.A., Novikov, K.N., Skrypin, V.I., Evstigneeva, R.P. and Stoytchev, T.S.: Effect of alpha-tocopherol derivatives with different chain length on in vitro and in vitro lipid peroxidation in liver microsomes. In: *Free Radicals, Oxidant Stress and Drug Action,* C. Rice-Evans, Ed., Richelieu Press, London, 425-441, 1987.

4. Kagan, V.E., Bakalova, R.A., Serbinova, E.A., Koynova, G.M., Baldenkov, G.N., Tkachuk, V.A. and Stoytchev, T.S.: Protein kinase C participate in the regulation of lipid peroxidation in biological membranes. In: *Free Radicals: Chemistry, Pathology, and Medicine*, C. Rice-Evans and T. Dormandy, Eds., Richlieu Press, London, 417-438, 1988.
5. Goltsev, V., Popov, O., Doltchinkova, V., Yordanov, I. and Kagan, V.E.: Effects of alpha-tocopherol derivatives on the photosynthetic activity of thylakoid membranes. In: *Electromagnetic Fields and Biomembranes*. M. Markov and M. Blank, Eds., Plenum Press, New York, London, 249-253, 1988.
6. Serbinova, E.A., Kadiiska, M.B., Stoytchev, T.S., Lankin, V.Z. and Kagan, V.E.: Enzymic and nonenzymic regulation of cytochrome P-450: disassembly, damage, protection and utilization. In: *Free Radicals in Liver Injury*, M. Dianzani, T. Slater, K. Cheeseman, Eds., Torino, *Advances in Biophysics and Induction*, A. Shuster, Ed., Taylor & Francis, London, New York, Philadelphia, 866-869, 1989.
7. Kagan, V.E., Bakalova, R.A., Serbinova, E.A. and Stoytchev, T.S.: Phospholipid hydroperoxides, microsomal membranes and cytochrome P-450: disassembly, damage, protection and utilization. In: *Free Radicals in Liver Injury*, M. Dianzani, T. Slater, K. Cheesman, Eds., Torino, *Advances in Biosciences*, vol. 76, 301-308, 1989.
8. Serbinova, E.A., Koynova, G.M., Stoytchev, T.S., Kagan, V.E.: Interaction of natural inhibitors of free radical lipid oxidation with cytochrome P-450 system. In: *Medical, Biochemical and Chemical Aspects of Free-Radicals*, vol. 1, Eds., by O. Hayaishi, E. Niki, M. Kondo, T. Yoshikawa, Elsevier Science Publishers, B. V. Amsterdam, 579-582, 1989.
9. Kagan, V.E., Serbinova, E.A., Bakalova, R.A., Tyurin, V.A., Stoytchev, T.S., Erin, A.N., Prilipko, L.L.: Antioxidant and nonantioxidant effects of vitamin E in biomembranes. In: *Medical, Biochemical and Chemical Aspects of Free Radicals*, vol. 1, Ed., by O. Hayaishi, E. Niki, M. Kondo, T. Yoshikawa, Elsevier Science Publishers, B.V. Amsterdam, 261-266, 1989.
10. Kagan, V.E., Spirichev, V.B., and Erin, A.N.: Vitamin E, Physical Exercise and Sport. In: *Nutrition, Physical Exercise and Sport*, J. Hickson and I. Wolinsky, Eds., CRC Press, Boca Raton, Florida, 256-278, 1989.
11. Kagan, V.E., Packer, L., Serbinova, E.A., Bakalova, R.A., Stoyanovsky, D.A., Zhelev, Zh.Zh., Harfouf, M., Kitanova, S.A., Rangelova, D.A.: Mechanism of Vitamin E Control of Lipid Peroxidation, Regeneration, Migration and Metal Chelation. In: *Biological Oxidation Systems*, Eds., C.C. Reddy, G.A. Hamilton, K.M. Madyastha. Acad. Press. Inc., vol. 2, 889-908, 1990.
12. Kagan, V.E., Bakalova, R.A., Karakashev, P.H. Lipid peroxidation in tumor cells and tissues of tumor-bearing animals. In: *Membrane Lipid Oxidation*. Ed., C. Vigo-Pelfrey, CRC Press, Boca Raton, Florida, vol. 3, 191-208, 1991.
13. Packer, L., Kagan, V.E., Serbinova, E.A. Participation of Ubiquinones in Membrane Antioxidation: Direct Radical Scavenging or Tocopherol Recycling? In: *Ubiquinones*, K. Folkers, Yamagami, G.P., Littaru, Eds., Elsevier Publications, Amsterdam, 1991, vol. 6, pp. 115-123.
14. Kagan, V.E., Serbinova, E.A., Maguire, J.J., Shvedova, A.A., Packer, L.: On the path from ubiquinone to ubiquinol: chain breaking lipid peroxy radical scavenging or vitamin E radical recycling? In: *Oxidative Damage and Repair (Chemical, Biological and Medical Aspects)*, K.J.A. Davies, Ed. Pergamon Press, 121-

125, 1992

15. Serbinova, E.A., Kagan, V.E., Han, D., Packer, L.: d-Alpha-tocotrienol is a more powerful membrane antioxidant than d-alpha-tocopherol. In: *Oxidative Damage and Repair (Chemical, Biological and Medical Aspects)*, K.J.A. Davies, Ed. Pergamon Press, 77-81, 1992
16. Kagan, V.E., Packer, L., Serbinova, E.A.: Relationship between free radical reactions and the function of the cytochrome P-450 system. In: *Free Radicals and the Liver*, F. Cosmos, and J. Feher, eds. Springer-Verlag, Berlin, 21-28, 1992.
17. Packer L. Kagan V.E.: Vitamin E: the antioxidant harvesting center of membranes and lipoproteins. In: *Vitamin E: Biochemistry and Clinical Applications*, L.Packer and J.Fuchs, eds., Marcel Dekker, NY., 179-192, 1993
18. Kagan V.E., Bakalova R.A., Ribarov S.R., Zhelev Z.Z., Serbinova E.A., Packer L.: Intermembrane transfer of a-tocopherol and its homologs. In: *Vitamin E: Biochemistry and Clinical Applications*, L.Packer and J.Fuchs, eds., Marcel Dekker, NY., 171-178, 1993
19. Serbinova E.A., Tsuchiya M., Goth S., Kagan V., Packer L. Antioxidant action of alpha-tocopherol and alpha-tocotrienol in membranes. In: *Vitamin E: Biochemistry and Clinical Applications*, L.Packer and J.Fuchs, eds., Marcel Dekker, NY., 235-243, 1993
20. Witt E., Kagan V., Packer L.: Vitamin E in skin: antioxidant and prooxidant balance. In: *Vitamin E: Biochemistry and Clinical Applications*, L.Packer and J.Fuchs, eds., Marcel Dekker, NY., 775-783, 1993
21. Serbinova E., Ivanova S., Kirova A., Kitanova S., Packer L., Kagan V.: Cytochrome P-450 under conditions of oxidative stress: role of antioxidant recycling in the protection mechanisms. *Adv. Exp. Med. Biol.* 316, 223-30, 1992
22. Kagan V.E., Packer, L.: Antioxidative function of vitamin E and ubiquinol. In: *Methods in Toxicology*, L. Lash and D. Jones, eds, Academic Press, vol. 2, 277-285, 1993
23. Kagan, V.E., Spirichev, V.B., Serbinova, E.A., Witt, E., Erin, A.N., Packer, L.: The significance of vitamin E and free radicals in physical exercise. in: *Nutrition in Exercise and Sport (2nd Edition.)* (I.Wolinsky, J.F. Hickson, eds), CRC Press, Boca Raton, 185-213, 1994
24. Engelman, D.T., Watanabe, M., Engelman, R.M., Rousou, J.A., Kisin, E.R., Kagan, V.E., Das, D.K.: Hypoxic preconditioning preserves antioxidant reserve and prevents calcium overload in the ischemic/reperfused working heart. *Surg. Forum*, 45, 204-212, 1994
25. Kagan, V.E., Stoyanovsky, D.A., Quinn, P.J.: Integrated functions of coenzyme Q and vitamin E in antioxidant action. In: *Free Radicals in the Environment and Toxicology*. (H.Nohl, H. Esterbauer, C. Rice-Evans, Eds), Richelieu Press, London, 221-248, 1994
26. Kagan, V.E., Stoyanovsky, D.A., Goldman, R., Darrow, R.M., Organisciak, D.T.: Antioxidant recycling and high light intensity-induced oxidative stress in the retina. In: *The oxygen paradox in biology and medicine* (K.J. Davies and F. Ursini, eds.), Cleup University Press, Padova, Italy, 551-560, 1995
27. Kagan, V.E., Nohl, H., Quinn, P.J.: Coenzyme Q: Its Role in Scavenging and Generation of

Radicals in Membranes. In: Handbook of Antioxidants (E. Cadenas and L. Packer, Eds), Marcel Dekker Inc., 157-201, 1996

28. Maulik, G., Kagan, V.E., Pakrashi, S., Maulik, N., Das, D.K.: Extracts of some Indian plants with potent antioxidant action. In: Natural Antioxidants: Molecular Mechanisms and Health Effects (W. Xin, L. Packer, eds.), Pergamon Press, 1996

29. Quinn, P.J., Kagan, V.E. Characterisation of clusters of vitamin E in model membranes. Synchrotron Radiation Department Scientific Reports, 1995-1996, vol. 1, 375-376, RJ Cernik, E. Towns-Andrews, Eds.

30. Prilipko, L.L., Kagan, V.E. Free radicals in pathogenesis of mental and neurological disorders. In: Neuroscience, Neurology and Health, WHO, Geneva, 1997 (Review)

31. Kagan, V.E., Ritov, V.B., Gorbunov, N.V., Menshikova, E., Salama, G. Oxidative stress and Ca^{++} transport in skeletal and cardiac sarcoplasmic reticulum. In: Oxidative stress in skeletal muscle. Ed.: A. Z. Reznick. Birhauser Verlag AG, Bazel, 181-199, 1998 (Review)

32. Day, B.W., Bergamini, S., Tyurina, Y.Y., Carta, G., Tyurin, V.A., Kagan, V.E. β -Carotene: an antioxidant or a target of oxidative stress in cells? Subcell Biochem. 30, 209-217, 1998

33. Kagan, V.E., Tyurina, Y.Y., Witt, E. Role of coenzyme Q and superoxide in vitamin E cycling. Subcell Biochem., 30: 491-507, 1998 (Review)

34. Kagan, V.E., Ritov, V.B., Tyurina, Y.Y., Tyurin, V.A. Sensitive and specific fluorescent probing of oxidative stress in different classes of membrane phospholipids in live cells using metabolically integrated cis-parinaric acid. Methods Mol Biol. 108, 71-87, 1998.

35. Kagan, V.E., Gorbunov, N.V. EPR measurements of nitric oxide-induced chromanoxyl radicals of vitamin E. Interactions with vitamin C. Methods Mol Biol. 108:277-284, 1998

36. Bayir, H., Kagan, V.E. Free radicals and acute brain injury: mechanisms of oxidative stress and therapeutic potential. In: Brain Injury (R.S.B. Clark and P. Kochanek, eds.), Kluwer Academic Publishers, Boston/Dordrecht/London, 115-144, 2001.

BOOKS IN RUSSIAN:

1. Kozlov, Y.P., Danilov, V.S., Kagan, V.E. and Sitkovsky, M.V.: Free radical lipid oxidation in biological membranes, Moscow State University Publishing House, Moscow. 88 pp., 1972.

2. Kozlov, Y.P., Kagan, V.E. and Arkhipenko, Y.V.: Molecular Mechanisms of Ca^{++} -transporting system damage by molecular oxygen. Irkutsk State University Publishing House, 136 pp. Irkutsk, 1983

3. Kagan, V.E., Orlov, O.N. and Prilipko, L.L.: Quantitative analysis of endogenous products of lipid peroxidation. Publishing House of the USSR Acad. Sci., Ser. Biophysics, vol. 18, 114 pp. 1986

PAPERS IN RUSSIAN AND OTHER EASTERN JOURNALS (published during my work

in the former Soviet Union and in Bulgaria)*

*Most of the papers are published in peer-reviewed prestigious soviet journals which are cover to cover translated into English and these translated editions are usually available in libraries in the US. Some of the papers are published in the journals that are not translated into English as indicated (in Russian).

1. Neyfakh, E.A. and Kagan, V.E.: Detection of lipid peroxides in tissues of normal animals. *Biochemistry USSR*, 33,3,511-517,1969
2. Neyfakh, E.A. and Kagan, V.E.: Accumulation of lipid peroxides in organs of tumour-bearing animals. *Biochemistry USSR*, 33,4,692-697,1969
3. Kagan, V.E. and Sytkovsky, M.V.: Lipid peroxidation in tissues and subcellular fractions of tumour-bearing animals. *Biology and Soil Sciences, Proc.Moscow State Univ.*, 6,117-119,1970 (in Russian)
4. Danilov, V.S., Sytkovsky, M.V., Kagan, V.E. and Kozlov, Y.P.: Polarographic studies of lipid peroxidation under normal and pathological conditions. *Biology Bulletin USSR*, 3,574-579,1972.
5. Blokha, V.V., Kagan, V.E., Sytkovsky, M.V., Danilov, V.S., Kols, O.R., and Kozlov Y.P.: Lipid peroxidation and excitation transduction in frog muscle. *Biophysics USSR*, 17,3,549-552,1972.
6. Kagan, V.E., Sytkovsky, M.V., Danilov, V.S. and Kozlov Y.P.: Generation of peroxides in membrane phospholipids and its role in pathogenesis of malignant growth. *Proc.Natl.Acad.Sc. USSR*, 208,3,733-735,1973
7. Kozlov, Y.P., Ritov, V.B. and Kagan, V.E.: Ca^{++} -transport and free radical lipid oxidation in sarcoplasmic reticulum membranes. *Proc.Natl.Acad.Sc.USSR*,212,5,216-219,1973 .
8. Kozlov, Y.P., Gluschenko, N.N., Obraztsov, V.V., Orlov, S.N., Kagan, V.E. and Danilov, V.S.: Free radical oxidation of lipids in biological membranes. 1.Autooxidation of polyunsaturated fatty acids under various conditions. *Biophysics USSR*, 18,1031-1036,1973 .
9. Kotelevtsev, S.V., Kagan, V.E., Arkhipenko, Yu.V. and Kozlov, Y.P: Reduction of stable nitroxide radicals in microsomal NADPH- and NADH-dependent electron transporting chains. *Biochemistry USSR*, 39, 5,1015-1020,1974
10. Novikov, K.N., Shvedova, A.A., Kagan, V.E., Kozlov, Y.P. and Ostrovsky, M.A.: Photo-induced changes in photoreceptor membranes and rhodopsin revealed by craft-copolymerisation. *Biophysics USSR*, 19,2,280-284,1974 .
11. Kagan, V.E., Kotelevtsev, S.V. and Kozlov, Y.P.: Role of enzymic lipid peroxidation in disassembly of liver endoplasmic reticulum membranes. *Proc.Natl.Acad.Sc.USSR.*, 217,1,213-216,1974 .
12. Kotelevtsev, S.V., Kagan, V.E., Arkhipenko, Y.V. and Kozlov, Y.P.: Study of interrelations

between lipid peroxidation and electron transfer in liver microsomes using nitroxide radicals. *Studia Biophysica*, 47,2,133-140,1974

13. Beriya, V.P., Kagan, V.E., Arkhipenko, Y.V. and Kozlov Y.P.: Antioxidants stabilize cytochrome P-450 in rat liver endoplasmic reticulum membranes. *Biophysics USSR*,20,2,238-240,1975

14. Sibeldina, L.A., Kagan, V.E., Shvedova, A.A., Novikov, K.N. and Kobelev, V.S.: H^1 -NMR study of molecular organization of photoreceptor membranes. *Proc.Natl.Acad.Sc.USSR.*, 224,2,228-231,1975.

15. Kagan, V.E., Sibeldina, L.A., Ritov, V.B., Kobelev, V.S., Kayushin, L.P and Kozlov, Y.P.: H^1 -NMR study of lipid-protein interactions in sarcoplasmic reticulum membranes. *Proc.Natl.Acad. Sc.USSR.*, 222,5,1223-1226,1975

16. Bogoslovskaya, E.P., Kagan, V.E., Gluschenko, N.N., Erokhin, V.N. and Kozlov, Y.P.: Effects of polyunsaturated fatty acids and of products of their autoxidation on ascite carcinoma cells. *Biology Bulletin*, 4, 128-133,1975

17. Novikov, K.N., Kagan, V.E., Shvedova, A.A. and Kozlov, Y.P.: Lipid-protein interactions in photoreceptor membranes under lipid peroxidation. *Biophysics USSR*, 20,6,1039-1042, 1975

18. Kagan, V.E., Shvedova, A.A., Novikov, K.N. and Kozlov, Y.P.: Effects of conformational rearrangements on spontaneous and induced lipid peroxidation in frog retina rod outer segments. *Biophysics USSR*, 20,6,1043-1048,1975

19. Kotelevtseva, N.V., Kagan, V.E., Lankin, V.Z. and Kozlov, Y.P.: On the role of "structural factor" in kinetics of free radical lipid oxidation in biomembranes. *Problems Med.Chem.*, 22,3,1039-1042,1976 (in Russian)

20. Ritov, V.B., Kagan, V.E., Myagkova, G.I., Moskvina, M.N. and Komarov, P.G.: Interaction of spin-labelled derivatives of saturated and unsaturated fatty acids with lipids and proteins in biomembranes. *Biophysics USSR*, 21,4,763-765,1976

22. Kocherginsky, N.M., Kagan, V.E., Novikov, K.N. and Davydov, R.M.: Possible regulation of the kinetics of non-enzymic reactions in photoreceptor membranes. *Studia Biophysics*, 58,1,43-50,1976

23. Novikov, K.N., Shvedova, A.A., Tyurin, V.A., Shukolyukov, S.A. and Kagan, V.E.: On the role of lipid composition in kinetics of phospholipid free radical oxidation in photoreceptor membranes. *Biophysics USSR*, 22,5,942-944,1977

24. Kagan, V.E., Azizova, O.A., Arkhipenko, Y.V., Kwaan, N.K., Kozlov, Y.P. and Vladimirov Y.A.: Lipid peroxidation induced functional and structural rearrangements in sarcoplasmic reticulum membranes. *Biophysics USSR*, 22,4,625-630,1977

25. Eluashvili, I.A., Pashinova, T.P., Bogdanova, E.P., Kagan, V.E. and Prilipko, L.L.: Effects of chlorpromazine on enzymic lipid peroxidation in rat liver microsomes.

Bull.Exp.Biol.Med.USSR, 9,323-326,1977

26. Arkhipenko, Y.V., Bilenko, M.V., Dobrina, S.K., Kagan, V.E., Kozlov, Y.P. and Shelenkova, L.N.: Damage of sarcoplasmic reticulum in skeletal muscles under ischemia: role of lipid peroxidation. Bull.Exp.Biol.Med.USSR, 6,683-686,1977

27. Kagan, V.E., Barybina, G.V. and Novikov, K.N.: Lipid peroxidation and degeneration of photoreceptors in the retina of vitamin E-deficient rats. Bull.Exp.Biol.Med.USSR, 4,411-413,1977

28. Belousova, L.V., Bratkovskaya, L.B., Galuschenko, I.V., Kagan, V.E. and Kozlov, Y.P.: Mechanisms of destabilization of photoreceptor membranes modified by reactive oxygen species. Biochemistry USSR, 42,10,1800-1809,1977

29. Kagan, V.E., Arkhipenko, Y.V., Dobrina, S.K., Kozlov, Y.P., Nadirov, N.K., Pisarev, V.B., Ritov, V.B. and Khafizov R.K.: Stabilizing effects of vitamin E in biomembranes exposed to lipid peroxidation. Biochemistry USSR, 42,8,1525-1531,1977

30. Kagan, V.E., Shukolyukov, S.A., Tyurin, V.A., Shvedova, A.A., Korchagin, V.P. and Galuschenko, I.V.: Effects of chemical modification of lipids by molecular oxygen on thermal stability of rhodopsin in photoreceptor membranes of wall-eyed pollock. Studia Biophysica,72,1,51-58,1978.

31. Kagan, V.E., Karagodin, V.P., Gianik, T. and Pasechnik, V.I.: Effects of lipid peroxidation and phospholipid hydrolysis products on elasticity of planar bilayer membranes. Biophysics USSR, 23,5,927-929,1978

32. Kagan, V.E., Tyurin, V.A., Sepetov, N.F., Ivanina, T.A., Shukolyukov, S.A. and Sibeldina, L.A.: H1-NMR study of the role of lipids in thermal stability of rhodopsin in photoreceptor membrane. Proc.Natl.Acad.Sc.USSR., 243,6,1571-1574,1978

33. Krasnovsky, A.A. and Kagan, V.E.: Generation and quenching of singlet oxygen by retinals. Proc.Natl.Acad.Sc.USSR, 242,1,229-232,1978

34. Kagan, V.E., Eluashvili, I.A. and Prilipko, L.L.: Enzymic lipid peroxidation and oxidative metabolism of chlorpromazine in brain microsomes. Bull.Exp.Biol.Med.USSR, 86,10,432-434,1978.

35. Klaan, N.K., Tyurin, V.A., Kagan, V.E., Shukolyukov, S.A., Novikov, K.N., Azizova, O.A., Vladimirov, Y.A. and Kozlov, Y.P.: Spin-probe study of molecular organization of lipids in photoreceptor membranes. Biol.Sciences, 11,39-44,1978 (in Russian)

36. Kagan, V.E., Shvedova, A.A. and Novikov, K.N.: Participation of phospholipases in "repair" of photoreceptor membranes after lipid peroxidation. Biophysics USSR, 23,2, 279-284,1978.

37. Kagan, V.E., Prilipko, L.L., Savov, V.M., Pisarev, V.A., Eluashvili, I.A. and Kozlov, Y.P.: On participation of free activated oxygen species in enzymic lipid peroxidation in biomembranes. Biochemistry USSR, 44,3,482-489,1979

38. Kagan, V.E., Churakova, T.D., Karagodin, V.P., Arkhipenko, Y.V., Bilenko, M.V. and Kozlov, Y.P.: Effects of phospholipid hydroperoxides and fatty acid hydroperoxides on Ca^{++} transport in sarcoplasmic reticulum membranes. *Bull.Exp.Biol.Med. USSR.*, 2,145-149,1979
39. Faktor, V.M., Uryvaeva, I.V. and Kagan, V.E.: Heterogeneity of cytochrome P-450 distribution in liver lobes, revealed by the effects of carbon tetrachloride. *Bull.Exp.Biol. Med.USSR.*, 4,364-366,1979
40. Kagan, V.E., Lankin, V.Z., Shvedova, A.A., Novikov, K.N., Dobrina, S.K., Bratkovskaya, L.B. and Kuliev, I.Y.: Enzymic and non-enzymic protective antioxidant systems in photoreceptors. *Bull.Exp.Biol.Med.USSR.*, 8,164-166,1979
41. Meerson, F.Z., Kagan, V.E., Prilipko, L.L., Rozhitskaya, I.I., Giber, L.M. and Kozlov, Y.P.: Lipid peroxidation stimulation in animals under emotional-painful stress. *Bull.Exp. Biol.Med.USSR.*, 10,404-406,1979
42. Meerson, F.Z., Kagan, V.E., Golubeva, L.Y., Ugolev, A.A., Shimkovich, M.V., Giber, L.M. and Rozhitskaya, I.I.: Prevention of stressory and hypoxic damage of the heart by antioxidant BHT. *Soviet Cardiology*, 8,108-111,1979 (in Russian)
43. Arkhipenko, Y.V., Bilenko, M.V., Kagan, V.E., Churakova, T.D. and Shelenkova, L.N.: The role of lipid peroxidation in skeletal muscles sarcoplasmic reticulum damage under ischemia. *Soviet Surgery*, 7,106,1979 (in Russian)
44. Meerson, F.Z., Kagan, V.E., Rozhitskaya, I.I. and Prilipko L.L.: Inhibitory effects of BHT and gamma-hydroxybutyrate on lipid peroxidation under emotional-painful stress. *Bull.Exp. Biol.Med. USSR*, 12,661-663,1980
45. Savov, V.M., Eluashvili, I.A., Pisarev, V.A., Prilipko, L.L. and Kagan, V.E.: NADPH- and organic hydroperoxides-dependent oxidation of epinephrine to adrenochrome in brain and liver microsomes. *Bull.Exp.Biol.Med.USSR*, 11,557-559,1980
46. Shukolyukov, S.A., Kalishevich, O.O., Tyurin, V.A., Dikarev, V.P., Korchagin, V.P., Kotelevtsev, S.V., Kagan, V.E., Mizner, B.I. and Sokolova I.A.: Chromatography, delipidation and formation of recombinants of rhodopsin from wall-eyed pollock's photoreceptors. *Biochemistry USSR*, 45,10,1767-1772,1980
47. Korchagin, V.P., Bratkovskaya, L.B., Shvedova, A.A., Arkhipenko, Y.V., Kagan, V.E. and Shukolyukov, S.A.: Oligomerization of intrinsic membrane proteins in the course of lipid peroxidation. *Biochemistry USSR*, 45,10,1767-1772,1980
48. Gamrekeli, D.V., Savov, V.M., Stepanova, L.I. and Kagan, V.E.: Interrelations between enzymic lipid peroxidation and benz(a)pyrene hydroxylation in rat liver microsomes. *Biol.Sciences*, 8,21-24,1980 (in Russian)
49. Meerson, F.Z., Malyshev, V.V., Kagan, V.E., Treschuk, L.I. and Rozhitskaya, I.I.: Activation of lipid peroxidation and focal contractures in the heart muscle of rats exposed to emotional-

painful stress. Soviet Arch.Pathol., 42,2,9-12,1980 (in Russian)

50. Tabidze, L.V., Kagan, V.E., Shukolyukov, S.A. and Ivanov, I.I.: Does a-tocopherol stabilize rhodopsin in photoreceptor membrane? Biophysics USSR, 25,2,340-341,1980

51. Savov, V.M., Kagan, V.E. and Prilipko, L.L.: Participation of activated oxygen species and peroxy radicals in rat liver microsomal lipid peroxidation, induced by organic hydroperoxides. Problems Med.Chem., 5,623-627,1980 (in Russian)

52. Meerson, F.Z., Kagan, V.E., Arkhipenko, Y.V., Belkina, L.M. and Rozhitskaya, I.I.: Prevention of lipid peroxidation activation in myocardium under stress and experimental infarction. Soviet Cardiology, 21,55-59,1980 (in Russian)

53. Meerson, F.Z., Arkhipenko, Y.V., Rozhitskaya, I.I. and Kagan, V.E.: Effects of adaptation to hypoxia on lipid peroxidation stimulation and antioxidant systems in myocardium under stressory and ischemic damage of the heart. Soviet Cardiology, 12,55-60,1980 (in Russian)

54. Kagan, V.E., Kuliev, I.Y., Spirichev, V.B., Shvedova, A.A. and Kozlov, Y.P.: Accumulation of lipid peroxidation products and suppression of electrical activity of the retina in vitamin E-deficient rats exposed to high-light intensity. Bull.Exp.Biol.Med.USSR, 2,165-167,1981

55. Meerson, F.Z., Arkhipenko, Y.V., Rozhitskaya, I.I. and Kagan, V.E.: Disturbancies in Ca⁺⁺-transporting system of rat heart sarcoplasmic reticulum under emotional-painful stress. Bull. Exp.Biol.Med.USSR., 4,405-406,1981

56. Velikhanova, D.M., Bilenko, M.V. and Kagan, V.E.: Lipid peroxidation and damage of mixed function oxidases in endoplasmic reticulum membranes under liver ischemia. Bull.Exp.Biol.Med. USSR, 7,50-52,1981

57. Libe, M.L., Bogdanova, E.P., Rosenberg, A.E., Prilipko, L.L., Kagan, V.E. and Kozlov, Y.P.: H³-hydroxytryptamine and H³-diazepam binding and lipid peroxidation in brain membrane fractions. Bull.Exp.Biol.Med.USSR, 11,552-554,1981

58. Bogdanova, E.P., Kagan, V.E., Kuliev, I.Y., Meerson, F.Z. and Prilipko, L.L.: Stress-induced activation of lipid peroxidation in brain and appearance of antibodies to brain antigens. Immunology USSR, 2,65-66,1981 (in Russian)

59. Sokolov, V.S., Churakova, T.D., Bulgakov, V.G., Kagan, V.E., Bilenko, M.V. and Boguslavsky, L.I.: Effects of lipid peroxidation products on permeability of bilayer lipid membranes. Biophysics USSR, 26,1,149-147,1981

60. Bratkovskaya, L.B., Novikov, K.N., Shvedova, A.A., Polischuk, R.F., Kagan, V.E. and Kozlov, Y.P.: Pyridinenucleotide-dependent systems of lipid peroxidation induction in retina photoreceptors. Biol.Sciences, 6,21-26,1981 (in Russian)

61. Kagan, V.E., Kozlov, Y.P., Bilenko, M.V., Stepanova, L.I., Serbinova, E.A., Velikhanova, D.M. and Savov, V.M.: On participation of lipid peroxidation in circadian changes of cytochrome P-450 content in liver endoplasmic reticulum membranes. Biol.Sciences, 11,26-29,1981 (in Russian)

62. Kagan, V.E., Kopaladze, R.A., Prilipko, L.L., Libe, M.L., Turova, N.F. and Kozlov, Y.P.: On the mechanisms of toxic effects of hyperbaric oxygenation on the brain. *Biol.Sciences*, 5,26-30,1982 (in Russian)
63. Prilipko, L.L., Orlov, O.N., Ivanova, S.M., Kagan, V.E., Meerson, F.Z. and Ushakov, A.S.: Stress-induced activation of lipid peroxidation in humans evaluated by pentane content in the exhaled air. *Proc.Natl.Acad.Sci.USSR*, 265,4,1010-1015,1982
64. Meerson, F.Z., Kagan, V.E., Kozlov, Y.P., Belkina, L.M. and Arkhipenko, Y.V.: Lipid peroxidation in ischemia and antioxidants in protection of the heart. *Soviet Cardiol.*,2,81-92,1982 (in Russian)
65. Kuliev, I.Y., Shvedova, A.A., Kagan, V.E., Krasnovsky, A.A. and Kozlov, Y.P.: Light-induced damage of the retina: participation of singlet oxygen and lipid peroxidation. *Proc.Natl.Acad.Sc.USSR*, 263,5,1005-1009,1982
66. Vokk, P.A., Kagan, V.E. and Sukhareva, N.N.: Effects of ozone on superoxide dismutase activity in some microorganisms. *Biol.Sciences*, 10,95-98,1982 (in Russian)
67. Meerson, F.Z., Krasikov, S.I., Boev, V.M. and Kagan, V.E.: Effect of antioxidants on the resistance of untrained organism to exhausting physical loading. *Bull.Exp.Biol.Med.USSR*, 7,17-19,1982
68. Shvedova, A.A., Kagan, V.E., Kuliev I.Y., Dobrina, S.K., Prilipko, L.L., Meerson, F.Z. and Kozlov, Y.P.: Lipid peroxidation and damage of the retina in stress-exposed rats. *Bull.Exp. Biol.Med. USSR*, 4,24-27,1982
69. Kozlov, Y.P., Kagan, V.E., Beim, A.M., Dobrina, S.K., Kotelevtsev, S.V., Novikov, K.N., Savov, V.M. and Serbinova, E.A.: Biomonitoring test-systems based on membrane-bound enzymic complexes. 1.Study of mixed-function oxygenases in liver microsomes of endemic fishes of Baikal Lake.*Biol.Sciences*,1,20-25,1983 (in Russian)
70. Polyansky, N.B., Smirnov, L.D., Shvedova, A.A., Kagan, V.E. and Tkachuk, V.A.: Inhibition of phosphodiesterase of cyclic nucleotides from rabbit heart by hydroxypyridines. *Problems Med. Chem.* 1, 123-127,1983 (in Russian)
71. Kagan, V.E., Arkhipenko, Y.V. and Kozlov, Y.P.: Effects of lipid peroxidation on enzymic Ca^{++} -transporting system in sarcoplasmic reticulum membranes. Changes of chemical composition and of ultrastructural organization of membranes. *Biochemistry USSR.*, 48,1,158-166,1983
72. Kagan, V.E., Arkhipenko, Y.V., Ritov, V.B. and Kozlov, Y.P.: Effects of lipid peroxidation on enzymic Ca^{++} -transporting system in sarcoplasmic reticulum membranes. Molecular mechanisms of membrsne Ca^{++} -permeability increase. *Biochemistry USSR.*, 48,2,320-330, 1983.
73. Kagan, V.E., Arkhipenko, Y.V. and Kozlov, Y.P.: Effects of lipid peroxidation on enzymic

Ca⁺⁺-transporting system in sarcoplasmic reticulum membranes. Molecular mechanisms of changes of Ca⁺⁺-ATPase activity. *Biochemistry USSR*, 48, 3, 433-441, 1983 .

74. Klaan, N.K., Azizova, O.A., Sibeldina, L.A., Arkhipenko, Y.V. and Kagan, V.E.: Effects of lipid peroxidation on enzymic Ca⁺⁺-transporting system in sarcoplasmic reticulum membranes. Rearrangements in molecular organization of membrane lipids. *Biochemistry USSR*, 48,4,626-633,1983

75. Azizova, O.A., Maksina, A.G., Klaan, N.K., Sukhanov, V.A., Arkhipenko, Y.V., Kagan, V.E., Vladimirov, Y.A. and Kozlov, Y.P.: Effects of lipid peroxidation on enzymic Ca⁺⁺-transporting system in sarcoplasmic reticulum membranes. Changes in molecular organization of Ca⁺⁺-ATPase lipoprotein complex. *Biochemistry USSR*, 48,5,861-868,1983 .

76. Kagan, V.E., Arkhipenko, Y.V., Meerson, F.Z. and Kozlov, Y.P.: Effects of lipid peroxidation on enzymic Ca⁺⁺-transporting system in sarcoplasmic reticulum membranes. In vivo damage under pathological conditions. *Biochemistry USSR*, 48,7,1141-1148,1983 .

77. Arkhipenko, Y.V., Pisarev, V.A. and Kagan, V.E.: Effects of lipid peroxidation on enzymic Ca⁺⁺-transporting system in sarcoplasmic reticulum membranes. Generation of activated oxygen species and lipid peroxidation regulation in sarcoplasmic reticulum of skeletal and heart muscles. *Biochemistry USSR*, 48,8,1261-1270,1983

78. Bilenko, M.V., Kagan, V.E., Velikhanova, D.M. and Komarov, P.G.: Protective effects of antioxidants and inducers of microsomal monooxygenases against ischemic/reoxygenation injury of the liver. *Bull.Exp.Biol.Med.USSR*, 4,30-33,1983

79. Kozlov, Y.P., Kagan, V.E., Biem, A.M., Novikov, K.N., Savov, V.M., Minin, A.A. and Serbinova, E.A.: Biomonitoring test-systems based on membrane-bound enzymic complexes. Study of enzymic and non-enzymic lipid peroxidation systems in liver microsomes of endemic Baikal-lake fishes. *Biol.Sciences*, 5,18-23,1983 (in Russian) .

80. Glazer, V.M., Kagan, V.E., Aibilev, S.K., Biem, A.M., Savov, V.M. and Kozlov, Y.P.: Biomonitoring test-systems based on membrane-bound enzymic complexes. Evaluation of genotoxicity of pollutants using Ames test-system with metabolic activation by fish microsomal oxygenases. *Biol.Sciences*, 9,91-94,1983 (in Russian) .

81. Osipov, A.N., Savov, V.M., Yakhyaev, A.V., Zubarev, V.E., Azizova, O.A., Kagan, V.E., Kozlov, Y.P. and Vladimirov, Y.A.: The role of free radicals, formed by the Fe/ascorbate system in induction of lipid peroxidation. *Biophysics USSR*, 28,2,2094-206,1983 .

82. Erin, A.N., Spirin, M.M., Tabidze, L.V. and Kagan, V.E.: Mechanisms of stabilization of biomembranes by vitamin E. Formation of complexes of alpha-tocopherol with fatty acids. *Biochemistry USSR*, 48,11,1855-1866,1983

83. Kagan, V.E., Savov, V.M., Didenko, V.V., Arkhipenko, Y.V. and Meerson, F.Z.: Calcium and lipid peroxidation in heart mitochondrial and microsomal membranes. *Bull.Exp. Biol.Med.USSR*, 4,46-48,1983

84. Serbinova, E.A., Savov, V.M. and Kagan, V.E.: Stimulation of proteolytic degradation of cytochrome P-450 in rat liver microsomes after lipid peroxidation. *Bull.Exp.Biol.Med.USSR.*, 6,53-55,1983
85. Shvedova, A.A., Kagan, V.E., Kuliev, I.Y. and Vekshina, O.M.: Mechanisms of retina damage by fluorescent dyes. *Bull.Exp.Biol.Med.USSR.*, 8,48-50,1983
86. Prilipko, L.L., Orlov, O.N., Kagan, V.E., Savov, V.M., Saltanov, A.I., Uvarova E.B., Shapot. V.S.: Accumulation of volatile products of lipid peroxidation in exhaled air of humans exposed to hyperbaric oxygenation. *Bull.Exp.Biol.Med.USSR.*, 10,24-26,1983
87. Kovaleva, E.S., Prilipko, L.L., Muranov, K.O. and Kagan, V.E.: Effects of antioxidants on H3-hydroxytryptamine release and uptake by rat brain synaptosomes. *Bull.Exp.Biol.Med.USSR.*, 10,55-57,1983
88. Babijaev, M.A., Savov, V.M. and Kagan, V.E.: Formation of complexes of superoxide anions with Ca^{++} . *Bull.Exp.Biol.Med.USSR.*, 11,47-48,1983
89. Novikov, K.N., Dudchenko, A.M., Ugolev, A.T., Kuznetsova Z.I., Lukjanova, L.D. and Kagan, V.E.: Stabilizing effects of antioxidants on cytochrome P-450 in hepatocytes. *Bull.Exp. Biol. Med.USSR.*, 11,50-52,1983
90. Prilipko, L.L., Kagan, V.E., Meerson, F.Z., Bogdanova, E.D., Brusovanik, V.I., Orlov, O.N. and Arkhipenko, Y.V.: The role of lipids in modification of brain beta-receptors under emotional-painfull stress. *Bull.Exp.Biol.Med.USSR.*, 11.6-8,1983
91. Tabidze, L.V., Ritov, V.B., Kagan, V.E. and Kozlov, Y.P.: Vitamin E protects sarcoplasmic reticulum membranes against damage induced by free fatty acids. *Bull.Exp.Biol.Med.USSR.*, 11,48-50,1983
92. Meerson, F.Z., Sazontova, T.G., Kagan, V.E., Tverdokhlib, V.P. and Arkhipenko, Y.V.: The role of lipid peroxidation in inhibition of rat heart Na,K-ATPase under stress. *Bull.Exp..Biol.Med. USSR.*, 12,42-44,1983
93. Kagan, V.E., Kopaladze, R.A., Prilipko, L.L., Savov, V.M.: The role of lipid peroxidation induced hydroxytryptamine receptor modification in the formation of epileptiformic convulsions. *Bull.Exp.Biol.Med.USSR.*, 12,16-18,1983
94. Krasnovsky, A.A., Minin, A.A. and Kagan, V.E.: Mechanisms of singlet oxygen luminescence quenching by saturated and unsaturated fatty acids. *Proc.Natl.Acad.Sci.USSR.*, 268,6,1488-1491,1983
95. Prilipko, L.L., Kagan, V.E., Tjurin, V.A., Gorbunov, N.V. and Bogdanova, E.D.: Modification of lipids and changes in beta-receptors in brain synaptosomes. *Proc.Natl.Acad.Sci.USSR.*, 269,5,1260-1263,1983
96. Kagan, V.E., Bratkovskaya, L.B., Kuliev, I.Y. and Shvedova, A.A.: Role of lipid peroxidation in retina damage under hyperbaric oxygenation and possibility of chemical protection by antioxidants. *Proc.Natl.Acad.Sci.USSR.*, 271,1,227-230,1983

97. Erin, A.N., Skrypin, V.I. and Kagan, V.E.: Formation of complexes between alpha-tocopherol and fatty acids. The nature of complexes. Proc.Natl.Acad.Sci.USSR., 273,2,489-493,1983.
98. Kreps, E.M., Tjurin, V.A., Gorbunov, N.V., Brusovanik, V.I., Prilipko, L.L. and Kagan, V.E.: Formation of monoacylglycerophosphatides in the course of interactions of ligands with receptors. A possible mechanism of receptor desensitization. Proc.Natl.Acad.Sci.USSR., 273,3,753-757,1983
99. Meerson, F.Z., Berestneva, Z.V., Boev, V.M., Kagan, V.E., Prilipko, L.L. and Golubeva L.Y.: Effects of antioxidant on heart contractility and physical endurance in humans. Theory and Practice of Physical Culture, 9,37-42,1983 (in Russian)
100. Polyansky, N.B., Smirnov, L.D., Shvedova, A.A. and Kagan, V.E.: Inhibition of cyclic nucleotide phosphodiesterase in frog rod outer segments membranes by 3-hydroxypyridines. Biol.Sciences, 1,27-31,1984 (in Russian)
101. Glazer, V.M., Savov, V.M., Abilev, S.K., Shesterin, S.I., Beim, A.M., Kagan, V.E.: Biomonitoring test-systems based on membrane-bound enzymic complexes. Evaluation of genotoxic effects in Ames test-system with metabolic activation by fish liver microsomal monooxygenases. Biol.Sciences, 5,85-89,1984 (in Russian)
102. Kagan, V.E., Savov, V.M. and Serbinova, E.A.: Mechanisms of disassembly of a mixed function oxygenase system in liver endoplasmic reticulum.1. The role of peroxidation of membrane phospholipids. Acta Physiol.Pharmacol.Bulgarica, 10,2,73-81,1984
103. Kagan, V.E., Savov, V.M. and Serbinova, E.A.: Mechanisms of disassembly of a mixed function oxygenase system in liver endoplasmic reticulum. 2.The interrelation between lipid peroxidation and proteolytic degradation of cytochrome P-450. Acta Physiol.Pharmacol.Bulgarica, 10,2,82-90,1984
104. Novikov, K.N., Viner, R.I., Dudchenko, A.M., Ugolev, A.T., Lukyanova, L.D. and Kagan, V.E.: Products of hydrophobic xenobiotics hydroxylation - stabilizers of cytochrome P-450 in hepatocytes. Bull.Exp.Biol.Med.USSR., 9,294-296,1984
105. Dupin, A.M., Boldyrev, A.A., Arkhipenko, Y.V. and Kagan, V.E.: Protection by carnosine against damage induced in sarcoplasmic reticulum membranes by lipid peroxidation. Bull.Exp.Biol. Med.USSR., 8,186-188,1984
106. Kagan, V.E., Savov, V.M., Didenko, V.V., Arkhipenko, Y.V. and Meerson, F.Z.: Interrelations between activity of antioxidant systems and endogenous lipid peroxidation in the left and right ventricles of the myocardium. Bull.Exp.Biol.Med.USSR., 6,664-666,1984
107. Erin, A.N., Skrypin, V.I., Prilipko,L.L. and Kagan, V.E.: Formation of complexes of butylated hydroxytoluene with fatty acids. Bull.Exp.Biol.Med.USSR., 5,572-574,1984

108. Kagan, V.E., Polyansky, N.B., Muranov, K.O., Shvedova, A.A., Smirnov, L.D. and Dyumaev, K.M.: Suppression of aggregation and inhibition of phosphodiesterase of cyclic nucleotides in platelets by 3-hydroxypyridines. *Bull.Exp.Biol.Med.USSR.*, 4,416-418,1984
109. Meerson, F.Z., Didenko, V.V., Savov, V.M., Kopaladze, R.A., Dosmagambetova, R.S. and Kagan, V.E.: Lipid peroxidation under experimental myocardial infarction: effect of hyperbaric oxygenation. *Bull.Exp.Biol.Med.USSR.*, 10,398-400,1984
110. Pliquet, F., Sergienko, V.V., Wunderlich, Z., Kagan, V.E.: Changes of passive electric properties of red blood cells after haemosorption. *Bull.Exp.Biol.Med.USSR.*, 10,414-416,1984
111. Grinio, L.P., Orlov, O.N., Prilipko, L.L. and Kagan, V.E.: Lipid peroxidation in children with inherited Duchenne myopathy. *Bull.Exp.Biol.Med.USSR.*, 10,423-425,1984
112. Polyansky, N.B., Smirnov, L.D., Shvedova, A.A. and Kagan, V.E.: Inhibition of cyclic nucleotide phosphodiesterase from frog rod outer segments by 3-hydroxypyridines. *Biol.Sciences*, 1,27-31,1984 (in Russian)
113. Minin, A.A., Grigoryan, G.Y., Kagan, V.E. and Tkachuk, V.A.: Reconstitution of hormone-sensitive adenylate cyclase after solubilization by sodium cholate. *Biol.Membranes (USSR)*, 1,7,691-695,1984
114. Osipov, A.N., Savov, V.M., Yakhyaev, A.V., Zubarev, V.E., Azizova, O.A., Kagan, V.E. and Vladimirov, Y.A.: Spin-trapping study of radicals, generated during interaction of organic hydroperoxides with iron. *Biophysics USSR.*, 29,4,533-537, 1984
115. Azizova, O.A., Osipov, A.N., Savov, V.M., Zubarev, V.E., Kagan, V.E. and Vladimirov, Y.A.: Spin-trapping study of linolenic acid radicals formed in Fenton system. *Biophysics USSR.*, 29,5,766-770,1984
116. Ananieva, L.K., Ivanov, I.I., Tabidze, L.V. and Kagan, V.E.: Mechanism of Ca-ATPase stabilization by vitamin E against thermal denaturation stimulated by fatty acids. *Biochemistry USSR.*, 49,1,60-67,198
117. Kagan, V.E., Tyurin, V.A., Gorbunov, N.V., Prilipko, L.L. and Chelomin, V.P.: Is microviscosity changes and asymmetrical distribution of phospholipids in the membrane an obligatory prerequisite for signal transduction? *Journ.Evolut.Biochem.Physiol. USSR.*,20,1,9-15,1984
118. Kagan, V.E., Prilipko, L.L. and Savov, V.M.: Formation of inhibitors of lipid peroxidation during oxidative metabolism of hydrophobic xenobiotics catalyzed by mixed function oxygenases. *Acta Physiol.Pharmacol.Bulgarica*, 10,3,46-56,1984
119. Passechnik, V.I., Hianik, T., Karagodin, V.P. and Kagan, V.E.: Elasticity, strength and stability of bilayer lipid membranes and their changes due to phospholipid modification. *Gen.*

Physiol.Biophys., 3,6,475-482,1984

120. Meerson, F.Z. and Kagan, V.E.: The role of lipid peroxidation in the damage of membrane structures of cardiomyocytes. In: Pathogenesis and prevention of stressory and ischaemic damage of the heart. Meerson, F.Z., Ed., Moscow, Medicine Publishing House, 122-135,1984 (in Russian)

121. Komarov, P.G., Bilenko, M.V., Shvedova, A.A. and Kagan, V.E.: Evaluation of the efficiency of different compounds in inhibition of enzymic lipid peroxidation. Problems Med.Chem., 2,40-45,1985 (in Russian)

122. Kagan, V.E., Serbinova, E.A., Minin, A.A., Savov, V.M., Novikov, K.N., Osipov, A.N., Zubarev, V.E. and Azizova, O.A.: Study of the mechanism of initiation of enzymic NADPH-dependent lipid peroxidation in liver endoplasmic reticulum membranes. Biochemistry USSR., 50,6,986-991,1985

123. Erin, A.N., Tyurin, V.A., Brusovanik, V.I., Gorbunov, N.V., Selischeva, A.A., Prilipko, L.L. and Kagan, V.E.: Changes of physico-chemical properties of synaptosomal membranes treated by phospholipase A₂. Biochemistry USSR., 50,3,507-513,1985

124. Savov, V.M., Osipov, A.N., Ozhogina, O.A., Novikov, K.N., Zubarev, V.E., Azizova, O.A. and Kagan, V.E.: Mechanism of initiation of lipid peroxidation in system containing phenazine-methasulfate/NADH. Biophysics USSR., 30,4,598-601,1985

125. Skrypin, V.I., Erin, A.N., Bratkovskaya, L.B. and Kagan, V.E.: Alpha-tocopherol - a modifier of the phase transitions in the lipid bilayer. Bull.Exp.Biol.Med.USSR., 12,673-675,1985

126. Balevska, P.S., Kassabova, T.A., Russanov, E.M. and Kagan, V.E.: Inhibition of phospholipid hydrolysis by phospholipase A₂ in microsomal and mitochondrial membranes, preexposed to lipid peroxidation. Bull.Exp.Biol.Med.USSR., 2,161-164,1985

127. Babijaev, M.A., Shvedova, A.A., Arkhipenko, Y.V. and Kagan, V.E.: Accumulation of lipid peroxidation products in cataract lenses. Bull.Exp.Biol.Med.USSR., 9,299-301,1985

128. Orlov, O.N., Prilipko, L.L., Rodionov, V.V., Demurov, E.A., Kagan, V.E., Meerson, F.Z. and Efuni, S.N.: Estimation of endogenous lipid peroxidation level in humans, exposed to hyperbaric oxygenation. Proc.Natl.Acad.Sci.USSR., 283,2,493-496,1985

129. Savov, V.M., Didenko, V.V., Dasmagambedova, R.S., Meerson, F.Z. and Kagan, V.E.: Lipid peroxidation in myocardium under experimental infarction. Biol.Sciences., 5,30-33,1985 (in Russian)

130. Azizova, O.A., Osipov, A.N., Savov, V.M., Yakhyaev, A.V., Zubarev, V.E., Kagan, V.E. and Vladimirov, Y.A.: Mechanisms of initiation of non-enzymic lipid peroxidation in system: Fe⁺⁺ -ascorbate -linolenic acid. Biophysics USSR., 30,1,36-39,1985

131. Badalyan, L.O., Grinio, L.P., Islamova, I.B., Belousova, L.V., Rafanov, V.S., Prilipko, L.L. and Kagan, V.E.: On the pathology of membrane structures under Duschenne myodystrophy in humans. Soviet Journ.Neuropathol.Psychiatry, 85,11,1631-1633,1985 (in Russian)

132. Arkhipenko, Y.V., Meerson, F.Z., Sazontova, T.G. and Kagan, V.E.: Mode of lipid-peroxidation induced inhibition of Na,K-ATPase. *Acta Physiol.Pharmacol.Bulgarica*, 11,1,70-78,1985
133. Serbinova, E.A., Tyurin, V.A., Stoytchev, T.S. and Kagan, V.E.: Is a relay mechanism of antioxidant effect of tocopherols valuable for membrane structures? *Acta Physiol. Pharmacol. Bulgarica*, 11,3,55-60,1985
134. Novikov, K.N. and Kagan, V.E.: Stabilization of cytochrome P-450 in hepatocytes by free radical scavengers of different nature. *Acta Physiol.Pharmacol.Bulgarica*, 11,3,61-69,1985
135. Kagan, V.E., Monovich, O. and Ribarov, S.R.: Induction of lipid peroxidation in red blood cells in the course of cholesterol oxidation, catalyzed by cholesterol-oxidase. *Bull.Exp.Biol. Med.USSR.*, 8,179-181,1985
136. Erin, A.N., Skrypin, V.I., Prilipko, L.L. and Kagan, V.E.: Formation of complexes of alpha-tocopherol with phosphatidic acid. *Bull.Exp.Biol. Med.USSR.*, 8,184-186,1985
137. Skrypin, V.I., Erin, A.N., Kagan, V.E. and Prilipko, L.L.: Interaction of alpha-tocopherol with free fatty acids. Spatial organization of the complex. *Bull.Exp.Biol.Med.USSR.*, 6, 682-684, 1986
138. Savov, V.M., Babijaev, M.A. and Kagan, V.E.: Mechanisms of Ca⁺⁺ effects on lipid peroxidation. *Bull.Exp.Biol.Med.USSR.*, 6,693-695,1986
139. Erin, A.N., Skrypin, V.I., Prilipko, L.L. and Kagan, V.E.: Mechanism of stabilization of synaptosomes by alpha-tocopherol during exposure to phospholipase A₂. *Bull.Exp.Biol. Med.USSR.*, 7,25-28,1986
140. Kagan, V.E., Skrypin, V.I., Serbinova, E.A., Raikova, D.P., Tyurin, V.A. and Stoytchev, T.S.: Localization of alpha-tocopherol in the hydrophobic zone of a lipid bilayer. *Proc.Natl.Acad.Sci. USSR.*, 288,5,1242-1246,1986
141. Serbinova, E.A., Bakalova, R.A., Stoytchev, T.S. and Kagan, V.E.: Efficiency of lipid peroxidation inhibition in biomembranes by antioxidants with and without hydrocarbon chains. *Bull.Exp.Biol.Med.USSR.*, 10,419-421,1986
142. Muranov, K.O., Polyansky, N.B., Shvedova, A.A., Smirnov, L.D. and Kagan, V.E.: Changes in the cyclic nucleotide level and the inhibition of human platelet aggregation in 3-hydroxypyridine exposure. *Bull.Exp.Biol.Med.USSR.*, 10,432-434,1986
143. Meerson, F.Z., Sazontova, T.G., Arkhipenko, Y.V. and Kagan, V.E.: Thermal denaturation of Na,K-ATPase in the rat myocardial sarcolemma and possible role of damage of this enzyme in the pathogenesis of arrhythmias. *Problems Med.Chem.*, 32,5,67-71,1986 (in Russian)
144. Volkovitskaya, O.E., Bochev, P.G., Ribarov, S.R., Gorkin, V.Z. and Kagan, V.E.: Study of monoamine oxidase from human placenta mitochondria by the chemiluminescent method.

Problems Med.Chem., 32,5,77-79,1986 (in Russian)

145. Kagan, V.E., Ivanova, S.M., Murzakhmetova, M.K, Shvedova, A.A. and Smirnov, L.D.: Antioxidants - stabilizers of the C^{++} -transport enzyme system in sarcoplasmic reticulum membranes in vivo. Bull.Exp.Biol.Med.USSR., 11,52-54,1986

146. Volkovitskaya, O.E., Bochev, P.G., Ribarov, S.R., Gorkin, V.Z. and Kagan, V.E.: Formation of superoxide anion-radical during the oxidation of biogenic amines catalyzed by mitochondrial monoamine oxidase. Bull.Exp.Biol.Med.USSR., 12,687-689,1986

147. Tyurin, V.A., Kagan, V.E., Serbinova, E.A., Gorbunov, N.V. and Erin, A.N.: The interaction of alpha-tocopherol with phospholipid liposomes: the absence of transbilayer mobility. Bull.Exp.Biol. Med.USSR., 12,689-692,1986

148. Balevska, P.S., Tyurin, V.A., Kassabova, T.A., Russanov, E.M. and Kagan, V.E.: Inhibition of phospholipid hydrolysis by soluble phospholipase A₂ in biological membranes of different origin after lipid peroxidation. Acta Physiol.Pharmacol.Bulgarica, 12,3,58-65,1986

149. Kreps, E.M., Tyurin, V.A., Gorbunov, N.V., Maksimovich, A.A., Polyakov, V.N., Plyusnin, V.V. and Kagan, V.E.: Activation of lipid peroxidation during spawning migration stress in salmon: a possible mechanism of adaptation. Proc.Natl.Acad.Sci.USSR., 286,4,1009-1012,1986

150. Viner, R.I., Novikov, K.N., Arkhipenko, Y.V., Skrypin, V.I., Kozlov, Y.P., Spirichev, V.B. and Kagan, V.E.: Nonantioxidant mechanism of cytochrome P-450 stabilization by alpha-tocopherol: efficiency in vitamin E-deficient animals. Biochemistry USSR., 51,9,1549-1554,1986

151. Babijaev, M.A., Arkhipenko, Y.V. and Kagan, V.E.: Activity of antioxidant enzymes and metabolism of peroxide compounds in the cataract lenses. Bull.Exp.Biol.Med.USSR., 2,143-146,1987

152. Erin, A.N., Gorbunov, N.V., Skrypin, V.I., Kagan V.E. and Prilipko, L.L.: Interaction of alpha-tocopherol with free fatty acids. Mechanism of stabilization of lipid bilayer microviscosity. Biol.Sciences, 1,10-16,1987 (in Russian)

153. Shvedova, A.A., Platonov, E.S., Polyansky, N.B., Babijaev, M.A. and Kagan, V.E.: The chemical nature of the fluorescent products accumulating in the lipids of the lenses of mice with hereditary cataract. Bull.Exp.Biol.Med.USSR., 3,301-304,1987

154. Viner, R.I., Novikov, K.N., Kozlov, Y.P. and Kagan, V.E.: Does alpha-tocopherol interact with the active site of cytochrome P-450 in liver microsomes? Bull.Exp.Biol.Med.USSR., 3,304-306,1987

155. Viner, R.I., Novikov, K.N., Kozlov, Y.P. and Kagan, V.E.: Inhibition of the dealkylating activity of cytochrome P-450 isoforms in rat livermicrosomes by the products of phospholipase A₂-induced phospholipid hydrolysis. Biochemistry USSR., 52,3,459-468,1987

156. Kagan, V.E., Serbinova, E.A., Bakalova, R.A., Stoytchev, T.S. and Erin, A.N.: Mechanisms of biomembrane stabilization by alpha-tocopherol. The role of the isoprenoid chain in the inhibition of lipid peroxidation. *Proc.Natl.Acad.Sci.USSR.*, 295,3,728-731,1987
157. Simidjiev, I., Kagan, V.E. and Minkov, I.B.: Effect of alpha-tocopherol and its derivatives on ATPase and oxidative phosphorylation in rat liver mitochondria. *Bull.Exp.Biol.Med.*, 9,299-301,1987
158. Tyurin, V.A., Korolkov, S.N., Berman, A.L. and Kagan, V.E.: Structural stabilization of lipids and visual pigment rhodopsin in the photoreceptor membrane by vitamin E. *Bull.Exp.Biol.Med. USSR.*, 10,391-394,1987
159. Sukhareva-Nemakova, N.N., Vokk, R.A. and Kagan, V.E.: Changes in the phospholipid composition of microorganisms induced by ozone. *Biology Bulletin USSR.*, 6,871-880,1987
160. Kreps, E.M., Tyurin, V.A., Chelomin, V.P., Gorbunov, N.V., Nalivaeva, N.N., Tyurina, Y.Y., Avrova, N.F. and Kagan, V.E.: Study of mechanisms of initiation of lipid peroxidation in synaptosomes from the brain of marine teleosts. *J.Evolut.Biochem.Physiol.USSR.*, 23,4,461-467,1987
161. Erin, A.N., Davitashvili, N.G., Prilipko, L.L., Boldyrev, A.A., Luschak, V.I., Batrakov, S.G., Pridachina, N.N., Serbinova, E.A. and Kagan, V.E.: Effects of alkylresorcinol on biomembranes under activation of lipid peroxidation. *Biochemistry USSR.*, 52,7,1180-1185,1987
162. Tyurin, V.A., Kagan, V.E., Avrova, N.F. and Prozorovskaya, M.P.: Lipid asymmetry and alpha-tocopherol distribution in outer and inner monolayers of bilayer lipid membranes. *Bull.Exp. Biol.Med.USSR.*, 6,667-669,1988
163. Erin, A.N., Davitashvili, N.G., Kagan, V.E., Zakharova, E.I., Sarycheva, I.K. and Evstigneeva, R.P.: The role of isoprenoid chain of alpha-tocopherol in protection of synaptosomes against lipid peroxidation and damaging effects of phospholipase A₂. *Biochemistry USSR.*, 53,4,591-597,1988.
164. Bakalova, R.A., Nekrasov, A.S., Lankin, V.Z., Kagan, V.E., Stoytchev, T.S. and Evstigneeva, R.P.: The mechanism of inhibitory effects of alpha-tocopherol and its synthetic homologues on oxidation of linoleic acid, catalysed by reticulocyte lipoxygenase. *Proc.Natl. Acad.Sci.USSR.*, 299, 4,1008-1011,1988.
165. Gotlib, V.A., Tyurin, V.A., Rychkova, M.P., Berman, A.L., Lev, A.A. and Kagan, V.E.: Differential scanning microcalorimetry study of stabilizing effects of alpha-tocopherol on rhodopsin under damaging action of free fatty acids. *Bull.Exp.Biol.Med.USSR.*, 1, 132-137,1989.
166. Bekiarova, G.I., Markova, M.P., Kagan, V.E., Alpha-tocopherol protection of erythrocytes from hemolysis induced by thermal injury. *Bull.Exp.Biol.Med.*, 107(4):413-415,1989.
167. Antipov, A.D., Tyurin, V.A., Avrova, N.F., Khovanski, A.E., Kagan V.E.: Protection of

monoamine oxidase by water- and lipid-soluble antioxidants under lipid peroxidation in brain synaptosomes. *Bull.Exp.Biol.Med.USSR*, 2,169-171,1989.

168. Serbinova, E.A., Kadiiska, M.B., Tyurin, V.A., Kagan, V.E.: The protective effects of water- and lipid-soluble antioxidants on cytochrome P-450 under lipid peroxidation in liver microsomes. *Bull.Exp.Biol.Med.USSR*., 2,187-188, 1989.

169. Kagan, V.E., Tyurin, V.A., Kitanova, S.A., Serbinova E.A., Quinn, P.J. and Stoytchev, Ts.S.: The effects of ubiquinol homologues on lipid peroxidation in membranes of brain mitochondria and synaptosomes. *Bull.Exp.Biol.Med.USSR*., 4,420-422,1989.

170. Tyurin, V.A., Korolkov, S.N. and Kagan, V.E.: Transbilayer distribution of a-tocopherol and asymmetry of lipids in neural membranes. *Biochemistry USSR*, 54,940-947,1989.

171. Koynova G.M., Markovska, D., Staneva, D., Kagan, V.E., Activation of endogenous lipid peroxidation in the brain under conditions of oxidative stress caused by iron-loading and its prevention by vitamin E. *Bull. Exp. Biol. Med. USSR*, 109, 1, 35-37,1990.

172. Rangelova, D.A., Zhelev, Zh.Zh., Bakalova, R.A., Denisova, N.K., Tyurin, V.A., Serbinova, E.A., Kagan, V.E., Packer, L. Intermembrane transfer and antioxidant effects of alpha-tocopherol in liposomes. *Bull. Exp. Biol. Med. USSR*, 109, 1, 37-39,1990.

173. Tyurina, Y. Y., Tyurin, V.A., Avrova, N.F., Kagan, V.E., Ganglioside-dependent factor inhibiting lipid peroxidation in synaptosomal membranes. *Bull.Exp.Biol.Med. USSR*, 109, 6, 553-555,1990.

174. Stoyanovsky D.A. Kagan V.E., Afanas'ev I.B. Effect of ascorbic acid on decomposition of arachdinate-15-hydroperoxide in the presence of iron salts and complexes. *Bull.Exptl Biol.Med. USSR*, 110, 1485-1488, 1990

175. Kharfuf M., Serbinova E.A., Komissarov V.P., Erin A.N., Rakovski S., Bakalova R.A., Savov V.M., Kagan V.E. Mechanisms of the antioxidant action of hindered phenols. Membrane effects of BHT derivatives on luminol-dependent chemiluminescence.*Bull.Exptl Biol.Med. USSR*, 110, 480-483, 1990

176. Serbinova E.A., Kharfuf M., Ukhin L.Y., Komissarov V.P., Rakovsky S. Kagan V.E. Mechanisms of the antioxidant action of hindered phenols. Effects of BHT derivatives in membranes. *Bull.Exptl Biol.Med. USSR*, 110, 486-489,1990

177. Tyurin, V.A., Kuznetsova, L.A., Tyurina, Y.Y., Erin, A.N., Avrova, N.F., Pertseva, M.N., and Kagan, V.E. Participation of gangliosides in protecting beta-adrenoreceptors against damage by lipid peroxidation in synaptosomes. *Bull.Exp.Biol.Med.*, 111, 597-599, 1991

178. Konorev E.A., Saks V.A., Rudnev D.V., Konorev L.A., Sharov V.G., Kagan V.E., Pichugin V.V., Evstigneeva R.P. Phosphocreatine, tocopheryl phosphate and their combination in acute ischemia and myocardial reperfusion in dogs: the effect on rhythm disorders, left ventricle contractility and infarct size. *Proc Acad.Med, Sci. USSR*, (3):35-39,, 1991 (in Russian)

179. Gorbunov, N.V., Kagan, V.E., Alekseev, S.M., and Erin, A.N. Role of isoprenoid chain in

lateral mobility of alpha-tocopherol in lipid bilayer. Bull.Exp.Biol.Med., 112, 39-41, 1991

180. Bakalova, R.A., Sokolova, T., Ribarov, S., Kagan, V. Effects of alpha-tocopherol and its homologues on luminol-dependent chemiluminescence induced by (Fe²⁺ + NADPH) and (Fe²⁺ + ascorbate) in rat liver microsomes. Bull.Exp.Biol.Med. Russ. 112 (11): 482-485, 1991.

181. Kovacheva-Ivanova, S., Bakalova, R., Kagan, V., Georgiev, G. Activation of lipid peroxidation and changes in the vitamin E level in the lungs under oxidative stress. Bull.Exp.Biol. Med.Russ. 113 (2): 132-134, 1992

182. Tyurin, V.A., Bagrov, A.I., Fedorova, O.V., Zhabko, E.P., Tyurina, J.J., Avrova, N.F., Das, D.K., Kagan, V.E. Protection of the erythrocyte membranes by gangliosides in myocardial ischemia. Bull. Exp. Biol. Med. 114(10), 366-368, 1992

183. Tyurin, V.A., Erin, A.N., Tyurina, J.J., Avrova, N.F., Kagan, V.E. Gangliosides regulate free-radical reactions in brain membranes. Bull. Exp. Biol. Med. 114(12), 592-594, 1992

184. Tyulina, O.V., Kagan, V.E., Boldyrev, A.A. Effects of carnosine and related compounds on oxidative burst in leukocytes activated by barium sulphate. Bull. Exp. Biol. Med., 116 (11), 463-465, 1994

185. Kurella, A.G., Kagan, V.E., Bodyrev, A.A. Sensitivity of brain and kidney Na/K-ATPase to oxygen free radicals. Neurochemistry (Russia), 13, 4, 314-320, 1996.

PRESENTATIONS AT NATIONAL AND INTERNATIONAL MEETINGS

Invited as a Key-Note speaker, Plenary speaker or Session speaker at more than 300 congresses and meetings and presented more than 700 posters.

PROFESSIONAL ACTIVITIES

TEACHING

Formal classroom

1. EOH 2101 - Introduction to Research Methods I; Instructor Dr. VE Kagan
2. EOH 2102 - Introduction to Research Methods II; Instructor Dr. VE Kagan
3. EOH 2306 - Biochemical Techniques in Molecular Toxicology; Instructor Dr. VE Kagan
4. MSCMP - Cancer Biology and Therapeutics (Graduate Pharmacology Course Series);
3710 Instructor - Dr. JCYalowich (1 hour)
5. EOH 2175 - Principles of Toxicology. Instructor – Dr. JP Fabisiak (4 hours);
6. EOH 3210 - Molecular Fundamentals – Instructor - Dr. P. Di (1 hour)
8. MSMBPH 2012 Molecular Biophysics 2: Biomolecular Interactions and Dynamics
Instructor – Dr. J. Klein (1 hour)

SUPERVISION OF POSTDOCTORAL STUDENTS:

Postdoctoral Fellows Directed in Pittsburgh (since 1992):

Dr. Detcho A. Stoyanovsky, Topic: "Interaction of phenoxyl radicals with reductants (ascorbate and thiols) in model chemical systems"; September 1992-May 1995, 6 papers are published or accepted for publication during this period; currently at the Department of Biochemistry, Mount Sinai Medical Center, New York, NY10029

Dr. Vladimir A. Tyurin (on leave from the Institute of Evolutionary Biochemistry, St. Petersburg, Russia, supported by a training grant from UNESCO); Topic: "Oxidation of sulfhydryls in metallothioneins by VP-16 phenoxyl radicals"; October 1993-July 1994, second visit January 1997-Present. 20 papers published.

Dr. Vladimir B. Ritov (on leave from M.V. Lomonosov Moscow State University, supported by a training grant from NSF); Topic: "Effects of reactive phenoxyl radicals on Ca^{2+} -transport and Ca^{2+} -pump in sarcoplasmic reticulum membranes"; October 1993-August 1994, 4 papers published.

Dr. Yulia Y. Tyurina (on leave from the Institute of Evolutionary Biochemistry, St. Petersburg, Russia); Topic: "Reactivity of phenoxyl radicals of VP-16 and vitamin E homologues with intracellular GSH and protein sulfhydryls", October 1993-July 1994, , second visit January 1997-Present. 24 papers published.

Dr. Elizabeth V. Menshikova (on leave from the Helmholtz Research Institute for Eye Diseases, Moscow), Topic: "Characterization of Ca^{2+} -transport in pulmonary microsomes and its modification by oxidative stress"; October 1993-August 1994; 3 papers published.

Dr. Anatoly N. Osipov (on leave from N. Pirogov Medical University of Russia, Moscow); Topic "Role of ubiquinones in regeneration of vitamin E phenoxyl radicals by membrane electron transport); October 1994 -June 1995; 4 papers published.

Dr. Nikolai V. Gorbunov (collaboration with Walter Reed Institute of Research, Washington, D.C.); Topic: "Interactions of nitric oxide with antioxidants and their radicals); September 1994-December 1996, 6 papers published.

Dr. Catherine G. Kurella (on leave from the Institute of Neurology, Medical Academy, Russia); Topic: "Oxidative modification of Na,K-ATPase by phenoxyl radicals", October 1994-November 1994, 1 paper published.

Dr. Sebastiano Banni (on leave from the University of Cagliari, Italy); Topic "Quantitation of oxidative stress in cells", February 1995 - June 1995, 1 paper published

Dr. Andrew Kozlov (on leave from N. Pirogov Medical University of Russia, Moscow); Topic "Low-temperature ESR studies of NO-complexes with transition metal-binding proteins in the blood"; March 1995 - August 1995. 3 papers published.

Dr. Kazuhara Osaka (on leave from Jikei University School of Medicine, University of Tokyo, Japan); Topic "Development of methodology for assay of pharmacologically active Amphotericin B in biological fluids". February 1996 - August 1996; 2 papers published

Dr. Tatyana Sokolova (on leave from Institute of Evolutionary Biochemistry & Physiology, St. Petersburg, Russia); Topic "Phospholipid peroxidation in apoptosis". May 1997-October, 1997 (1 paper submitted)

Dr. Shang Xi Liu (on leave from Department of Biochemistry, The First Military Medical University, Guangzhou, China); Topic "Free radical regulation of copper transfer between metallothioneins and SOD". January, 1999-December 2001. 6 papers published.

Dr. Oleksander Kuzmenko (On leave from A.V. Palladin Institute of Biochemistry, Ukraine, Kiev); Topic: "Free radical/antioxidant approaches to chemoprevention of etoposide-induced acute myelogenous leukemia", February 1999-December 2000. 4 papers published

Dr. Kazuaki Kawai, (On leave from the Laboratory of Biological Sciences, Faculty of Pharmaceutical Sciences, Meijo University, Nagoya, Japan). Topic: "Oxidative stress and phospholipid signaling in apoptosis". March, 1999-June 2001. 5 papers published.

Dr. Tatsuya Matsuura (on leave from Tottori University, Japan). Topic: "Development of multiphoton-based imaging techniques to study oxidative stress in cells." March 2000-December 2001; 4 papers published.

Dr. Hulia Bayir (On leave from the University of Ankara, Turkey). Topic: "Biomarkers of oxidative stress in cerebrospinal fluid of children with brain trauma" (jointly with Safar Resuscitation Center, University of Pittsburgh); July 2000 – present, 4 papers published

Dr. Antonio Arroyo (On leave from the Department of Molecular and Cell Biology, University of Cordoba, Spain); Topic "Mechanisms of NADPH-oxidase-induced oxidative stress and apoptosis in neutrophils" March 2000 – December 2001, 3 papers published.

Dr. Jianfei Jiang (On leave from Institute of Chinese Medicine, Shanghai, PRC). Topic: "Cytochrome c-induced mechanisms of oxidative stress during apoptosis." August 2000 – present, 5 papers published

Dr. Behice Serinkan (On leave from the University of Istanbul, Turkey). Topic: "Effects of antioxidants on oxidation and externalization of phosphatidylserine during apoptosis and phagocytosis". March 2001 – December, 4 papers published

Dr. Gregory Borisenko (On leave from Medical University of Russia, Moscow, Russia). Topic: "Fluorescence detection of thiol radicals in cells". August 2001 – February 2004, 5 papers published.

Dr. Hareesh Babu (On leave from Cancer Center in Kerala, India). Topic: "Oxidative stress and externalization of phosphatidylserine in apoptosis". October 2002 – December 2003. 2 papers published

Dr. Mirjana Vidic (On leave from the University of Belgrade, Serbia). Topic: "Synthesis of fluorescently-labeled phosphatidylserine and its applications in studies of apoptosis". September 2002-March 2003. 2 papers published.

Dr. Alla Potapovich (On leave from the University of Belarus, Minsk, Belorussia). Topic:

“Phosphatidylserine signaling and ROS production by macrophages.” April 2003 – March 2005. 3 papers published.

Dr. Natalia Belikova (On leave from Medical University of Russia). Topic: “Mitochondrial targeting of anti-apoptotic radical scavengers.” January 2004 – Present. 2 papers published.

Dr. Olexander Kapralov (On leave from Institute of Biochemistry, Kiev, Ukraine). Topic: “Interactions of cytochrome c with cardiolipin resulting in a complex with peroxidase activity.” March 2004 – Present. 2 papers published.

Dr. Weihong Feng. Topic: “Lung Oxidative Stress Inflammation of Carbon Nanotubes.” January 2006 – Present.

Dr. Jin Ren. Topic: “Center for Medical Counter Measures Against Radiation.” September 2006 – Present.

Dr. Ruslan Rafikov. Topic: “Cardiolipin Oxidation during Irradiation Apoptosis.” May 2006 – August 2008.

Dr. Zhentai Huang. Topic: “Pulmonary Inflammation/Oxidative Stress by Carbon Nanotubes.” October 2006 - Present

Doctoral Students Directed during the work in the former USSR and Bulgaria (primary supervisor, 1974-1989):

Kotelevtsev, S.V., Ph.D. in biophysics (1975): “EPR studies of NAD(P)H-dependent electron transport in endoplasmic reticulum membranes using stable nitroxide radicals.”

Beriya, V.P. Ph.D. in biochemistry (1976): “Enzymatic lipid peroxidation as a trigger of disassembly of CYP450 system in endoplasmic reticulum membranes.”

Novikov, K.N. Ph.D. in biophysics (1977): “Light-induced free radical production in photoreceptor membranes.”

Arkhipenko, Yu.V., Ph.D. in biochemistry (1978): “Modulation of Ca²⁺-transport in sarcoplasmic reticulum membranes by oxidative stress.”

Savov, V.M Ph.D. in biophysics (1979): “Spin-trapping ESR study of radicals, generated during interaction of organic hydroperoxides transition metals and metalloproteins.”

Tyurin, V.A. Ph.D. in biophysics (1980): “Role of lipids in thermal stability of rhodopsin in photoreceptor membranes.”

Rozhitskaya, I.I., Ph.D. in biochemistry (1980) “Oxidative stress and damage of Ca²⁺-transport in sarcoplasmic reticulum induced by stress and ischemia/reperfusion of the heart”

Klaan, N.K, Ph.D. in biophysics (1981): “Spin-probe ESR study of molecular organization of lipids in membranes”

Sazontova, T.G., Ph.D. in biochemistry (1981) “Oxidative modification of Na,K-ATPase in rat myocardial sarcolemma.”

Churakova, T.D. Ph.D. in biochemistry (1982) "Role of lipid peroxidation in ischemia damage of skeletal muscles sarcoplasmic reticulum membranes."

Bratkovskaya, L.B., Ph.D. in biophysics (1982): "Oligomerization of intrinsic membrane proteins in the course of lipid peroxidation."

Serbinova, E.A. Ph.D. in biochemistry (1982): "Oxidative stress and proteolytic degradation of cytochrome P-450 in rat liver microsomes."

Kuliev, I.Y., Ph.D. in Biochemistry (1983): "Singlet-oxygen induced lipid peroxidation and suppression of electrical activity of the retina in vitamin E-deficient rats exposed to high-light intensity."

Velikhanova, D.M., Ph.D. in biochemistry (1983): "Ischemia/reperfusion-induced damage of mixed function oxidases in endoplasmic reticulum membranes in the liver: role of lipid peroxidation."

Tabidze, L.V., Ph.D. in biophysics (1983): " α -Tocopherol as a structural stabilizer of lipid bilayer in membranes."

Bulgakov, V.G., Ph.D. in biophysics (1983): "Ion permeability channels formed by lipid peroxidation products in bilayer lipid membranes."

Minin, A.A., Ph.D. in biochemistry (1984): "Reconstitution of hormone-sensitive adenylate cyclase after solubilization by different detergents."

Pisarev, V.A., Ph.D. in Biophysics (1985) "Generation of reactive oxygen species and its regulation regulation in sarcoplasmic reticulum of skeletal and heart muscles."

Skrypin, V.I., Ph.D. in biophysics (1986): "NMR studies of alpha-tocopherol as a modifier of phase transitions in membrane lipid bilayers."

Bakalova, R.A. Ph.D. in biochemistry (1987): "Membrane antioxidant mechanisms of vitamin E homologues differing in the length of their side chain."

Stoyanovsky, D.A. Ph.D. in biochemistry (1988): "Molecular mechanisms of antioxidant interactions of alpha-tocopherol."

Kharfuf, M., Ph.D. in biochemistry (1988): "Antioxidant mechanisms of hindered phenols in biomembranes."

Doctoral and MS Students Directed in Pittsburgh (primary supervisor):

Radoslav Goldman, Ph.D. student, Environ.Occup.Health (Molec. Toxicol.) - graduated (fall of 1996). Dissertation topic: "Molecular mechanisms and role of phenoxyl radicals in cytotoxicity of phenolic compounds." (Currently, a postdoctoral Fellow in the laboratory of Molecular Carcinogenesis, NCI, NIH).

Arunasri Gaddam, student in MS program - graduated (fall of 1997). Research project topic: "Oxidative stress in erythroleukemia cells: mechanisms of induction and protection by nitric oxide"

Vidisha Kini, MS student – graduated in June 2005. Research project topic: “Radical scavenging in mechanisms of apoptotic signaling by etoposide.”

Doctoral Students Directed in Pittsburgh (secondary supervisor):

Mr. Antonio Arroyo a Ph.D. student from the Department of Molecular and Cell Biology, University of Cordoba, Spain); Topic “One-electron reactions catalyzed by plasma membrane NADH-coenzyme Q reductase”. August 1997-December 1997; 1 paper published; graduated in March 2000 (Ph.D. in cell biology).

Mr. Gregory Borisenko a Ph.D. student from N. Pirogov Medical University of Russia, Moscow. Topic "Low-temperature ESR studies of copper/metallothionein complexes"; February 1998 – February 2000; 3 papers published; graduation date – December 2000.

Juanfang Wu, PhD. Student from the Department of Chemistry, University of Pittsburgh. “Online determination of extracellular glutathione in organotypic hippocampal slice cultures with a microfluidic device and confocal laser-induced fluorescence detection system, 2010.

Jing, Ji, PhD. Student from the Department of Environmental and Occupational Health. “Oxidative stress and traumatic brain injury, 2012.

Predoctoral Students Trained in Pittsburgh (secondary supervisor):

Mr. R. Rabledo (a minority summer student); Topic: “Interactions of VP-16 phenoxyl radicals with reductants in liver tissue and hepatocytes”, June-August, 1993

Ms. Gianfranca Carta (on leave from the University of Cagliari, Italy); Topic "Interaction of phenoxyl radicals with retinoids and carotenoids", February 1996 - January 1997; 2 papers published

Ms. Stefania Bergamini (on leave from the University Of Modena, Italy); Topic "Anti-prooxidant effects of carotenoids in live cells". March 1997 -July 1997; 1 paper published

Ms. Gwen Breuer (graduated from St. Vincent College, PA); Topic: “Antioxidant Reserves and Thiols in Metallothionein-Knock-out Mice Exposed to Acetaminophen”, May-August, 1997, 1 paper presented at the Meeting

Mr. Andrey Sedlov (on leave from MV Lomonosov Moscow State University, Russia, Moscow); Topic: “Multifluorescence analysis of the redox-status of proteins in cells”; October, 1998 – June 1999, 2 papers published.

Mike J. Taylor (summer student from Westminster College, PA); Topic: "Quinolizin-coumarins as physical enhancers of low level chemiluminescence to study oxidative stress in cells." May-July 2000; 1 paper published

Ian Martin (undergraduate student from King’s College, London, UK). Topic: “Free radical mechanisms of a phenolic antitumor drug, etoposide.” June 2001 – June 2002, 1 paper published.

Nagardjun Konduru (pre-doctoral fellow, EOH, University of Pittsburgh). Topic “Phospholipid

signaling in phagocytosis." July 2005 present, 1 paper published.

Faculty, Pre- and Postdoctoral Training Grants and Programs:

Faculty, EOH, DOD-supported Postdoctoral Training Program in Radiation Sciences

Faculty, Department of Pharmacology, Predoctoral Training Program in Pharmacological Sciences

Faculty, Departments of Anesthesiology and Critical Care Medicine, Training Program in Experimental Therapeutics in Critical Illness

GRANTS AND CONTRACTS RECEIVED (since 1992, direct costs only):

Grants:

- 1992-1993 PI, American Cancer Society, Institutional Small Grant, 10/01/92-12/30/93, 5% effort, \$5,500 my budget; \$5,500 total
- 1993-1995 PI, Grant from the American Heart Association, Pennsylvania Affiliate, Recycling of vitamin E and its antioxidant function in the heart, 07/01/93-06/30/95, 20% effort. \$63,640 my budget; \$63,640 total
- 1994-1996 PI, Grant from the American Institute for Cancer Research "Role of dietary antioxidants in free radical enhancement of etoposide (VP-16) antitumor activity." 07/01/94-06/30/96, 10% effort, \$100,000 my budget; \$100,000 total
- 1994-1996 PI, Grant from National Science Foundation "Role of coenzyme Q in regenerating vitamin E in electron transport membranes." 06/01/94-05/30/96, 10% effort, \$40,412 my budget; \$40,412 total
- 1994-1997 Co-PI, (Dr. J.C. Yalowich - PI) Grant from American Cancer Society, Free radical activation of VP-16/topoisomerase II interactions." 07/01/94-06/30/97, 10% effort; \$97,961 my budget; \$389,266 total
- 1994-1995 PI, Grant from the US Army Medical Command. Free radical mechanisms of hemorrhagic damage, 06/01/94-05/30/95, 5% effort, my budget \$8,488; \$8,488 total
- 1994-1995 PI, Grant from the US Army Medical Command. Ca²⁺ transport systems and pulmonary damage by blast overpressure. 08/01/94-07/31/95, 5% effort, my budget \$22,636; \$22,636 total
- 1995-1996 PI, Grant from the US Army Medical Command. Antioxidant protection against free radical damage by blast overpressure. 07/20/95-07/19/96, 10% effort, my budget \$36,364; \$36,364 total
- 1995-1998 Co-PI, (PI - Dr. Peter Quinn (King's College, University of London)) Grant from The Wellcome Trust "Antioxidant mechanisms of ubiquinones in non-energy transducing membranes", \$8,300 my budget; \$25,000 total (£14, 992)
- 1996-2000 PI, Grant from Center for Alternatives to Animal Testing; School of Hygiene and Public Health Johns Hopkins University "Fluorescent probing of oxidative stress and antioxidant efficacy in cell culture model", 02/01/96-01/31/99, \$43,097 my budget; \$43,097 total
- 1996-1998 PI, Grant from the US Army Medical Command. Nitric oxide in free radical protection of the lung. 09/30/96-03/31/98, 5% effort, my budget \$27,273; \$27,273 total
- 1997-2001 Co-Investigator, (J. Roberts - PI) Grant from NIH, NICHD "Preeclampsia: Convergence of Fetal and Maternal Factors." Project 3: Oxidative Stress in the genesis of preeclampsia. \$49,019 my budget; \$690,580 total

- 1997-2001 Co-Investigator, (M. McLaughlin - PI) Grant from NIH, NICHD "Preeclampsia: Convergence of Fetal and Maternal Factors." Project 4: Mediators of Vascular and Pathology in Preeclampsia. \$49,019 my budget; \$662,200 total
- 1997-1997 Co-PI (E. Serbinova - PI) Grant from NIH "Topical Vitamin D Treatment for Skin Disease and Aging" 10% effort, \$42,300 my budget; \$100,000 total
- 1997-2000 Co-PI, (N. Schor - PI), Grant from DOD "Exploiting bcl-2 Overexpression in the Chemotherapy of Breast Cancer, \$71,231 my budget; \$200,000 total
- 1997-1998 Co-PI, (N.Schor - PI), Grant from NIH (Shannon Award) "Targeted Therapy for Chemoresistant Tumors", \$18,900 my budget; \$100,000 total
- 1998-2002 Co-PI, (N.Schor - PI), Grant from NIH, NCI "Targeted Therapy for Chemoresistant Tumors", 10% effort, \$104,457 my budget; \$935,291 total
- 1998-1998 Co-PI (J. Fabisiak - PI), Grant from NIH "Endothelial lipid oxidation/translocation by paraquat", 02/01/98 - 07/30/98, \$10,100 my budget; \$49,997 total
- 1998-1998 Co-Investigator, (B.Day - PI), Grant from NIH, "Oxidative Biomarkers in Asthma" 02/01/97 - 07/30/97, \$32,800 my budget; \$50,000 total
- 1998-2001 PI, Grant from the American Institute for Cancer Research "Development of Nutritional Antioxidant-based Strategies to Prevent Etoposide-induced Acute Myeloid Leukemia" 01/31/98-12/31/99, 15% effort, \$150,000 my budget; \$150,000 total
- 1998-2003 Co-Investigator, (B.R.Pitt - PI) Grant from NIH "Metallothionein and Reactive Oxygen and Nitrogen Species, 01/01/98-12/31/02, 15% effort, \$134,151 my budget; \$985,239 total
- 1998-1999 Co-Investigator, (C. Hsia - PI) Grant from NIH "PNA, Nitroxide and 6OHDA for Metastatic Neuroblastoma" 10% effort, \$11,471 my budget; \$100,000 total
- 1998-2001 Co-Investigator (S. Graham - PI) Merit award from VA "The role of inducible cyclooxygenase in delayed neuronal injury" 10% effort, \$75,000 my budget
- 2000-2001 PI, Grant from Research Development Fund, Office of Research, University of Pittsburgh, to support research instrumentation, \$21,563
- 1999-2003 Co-Investigator (S. Graham - PI) Grant from NIH "Cyclooxygenase 2 and ischemic neuronal injury" 10% effort, \$163,057 my budget; \$631,978 total
- 1999-2002 Co-PI (J. Fabisiak - PI) Grant from EPA "Metal/metal/NO mixtures: metallothioneins and oxidative stress" 10% effort, \$586,000 total
- 1999-2000 Co-Investigator (T. Orchard - PI) Epidemiology of Diabetic Complications - Phase II; Grant from NIH, 5% effort, my budget \$90,400; \$2,300,000 total.
- 2000-2001 Co-Investigator on Projects 1 and 3 (PI - D. Marion), Molecular Mechanisms in Traumatic Brain Injury: from Bench to Bedside, my budget \$36,500/year
- 2000-2004 PI, Copper/Albumin Redox-Cycling in Preeclampsia. Grant from NIH HL64145, 1,225,000
- 2001-2006 Co-Investigator (PI-J. Greenberger). Gene therapy reduction of radiotherapy esophagitis. Grant from NIH 1R01 CA 83876-01A2 (my budget \$60,000/year)
- 2000-2005 Co-Investigator (PI-J.Siegfried) NIH SPORE grant in Lung Cancer (my budget \$16,000/year)
- 2002-2006 Co-PI (PI-J.Yalowich). Mechanisms and prevention of etoposide-induced leukemia. Grant from NIH NCI. 1R01 CA 90787-01 (my budget ≈\$54,500/year)
- 2002-2007 PI, Pulmonary phosphatidylserine oxidation during apoptosis. Grant from NIH NHLB HL70755, 1,000,000
- 2002-2007 Co-Investigator (PI- N. Schor). Antioxidant Strategies for Parkinson's Disease, NIH NCI, \$250,000/year (my budget ≈\$55,000/year)

- 2003-2008 Co-Investigator, (J. Roberts - PI) Grant from NIH, NICHD “Preeclampsia: Convergence of Fetal and Maternal Factors.” Project 3: Oxidative Stress in the genesis of preeclampsia. ≈\$25,000/year my budget; \$690,580 total
- 2003-2008 Co-Investigator (PI- N. Schor). Targeted Therapy for Chemoresistant Tumors. NIH NCI, \$250,000/year (my budget ≈60,000/year)
- 2003-2008 Director, Core on Biomarkers of Oxidative Stress, (PI-A. Choi), PPG from NHLB “Hyperoxic Lung Injury”(my budget ≈\$100,000/year).
- 2003-2008 Co-Investigator, (PI- M. Sanders), RO1 from NHLB “OSA and metabolic syndrome: role of oxidative stress” (my budget ≈\$25,000/year)
- 2005-2007 Co-Investigator (PI-M. Fink). Anti-apoptotic strategies against hemorrhagic shock. DARPA, DOD (my budget is ≈\$195,000), total budget is \$1,500,000/year
- 2005-2009 PI, Oxidative lipidomics of cell clearance: from nematodes to humans. Human Frontier Science Program. ≈\$350,000
- 2005-2009 PI on Sub-project 3 (PI of the Program Project - S. DeKosky). Neurolipidomics in dementia, Program project funded by the State of Pennsylvania (\$365,000)
- 2004-2009 Co-Investigator (PI-J. Greenberger). Mn-SOD-PL Irradiation Protection in the Oral Cavity, (my budget ≈\$150,000), total 1,000,000.
- 2005-2009 PI, NIOSH, CDC, Lung Oxidative Stress/Inflammation By Carbon Nanotubes. \$1,000,000.
- 2005-2010 PI on Project 2 “Prevention of cardiolipin oxidation in irradiation apoptosis,” a part of the Center for Medical Countermeasures against Radiation; (PI of the Center – J. Greenberger). My budget is \$900,000.
- 2006-2007 PI, NIH/Fogarty International Center, “Cytochrome c Mechanism of ROS signaling in Apoptosis” total budget is \$31,248 (no salary support)
- 2006-2011 Co-Investigator, “Novel Nitroxide resuscitation Strategies in Experimental Traumatic Brain Injury,” US Army (my budget ≈\$150,000)
- 2007-2012 Co-Investigator, “Regulation of Autophagy in Dopaminergic Cell Death,” NIH my budget = \$128,236
- 2007-2012 Co-Investigator, “Mechanisms and Prevention of Etoposide Induced Leukemia” NIH/NCI My budget = \$19,596
- 2008-2013 PI, “Oxidative Lipidomics of Pulmonary Endothelial Apoptosis in Hyperoxia,” NIH/NHLBI My budget = \$250,000
- 2008-2013 Co-Investigator, “Oxidative Lipidomics in Pediatric Traumatic Brain Injury” NIH/NINDS My budget = \$14,506
- 2008-2013 Co-Investigator, “Mechanisms of Preeclampsia Impact of Obesity” Magee Womens Research Institute and Foundation/NIH my budget is \$42,261
- 2008-2013 Co-Investigator, “TNF-alpha signaling in Silica-Induced Lung Fibrosis” NIH/NIEHS My budget is \$18,009
- 2009-2011 PI, “Irradiation Damage and Protection of Pulmonary Endothelium: Oxidative Lipidomics” NIH my budget is \$250,000
- 2010-2015 PI, “Lung Oxidative Stress/Inflammation by Carbon Nanotubes” NIH/NIOSH my budget is \$250,000
- 2010-2015 Co-Investigator, “Mitochondrial Targeting Against Radiation Damage” NIH/NIAID my Budget is \$183,124
- 2010-2015 PI, “Carbon Nanotubes Biodegradation by Neutrophil Myeloperoxidase” CDC/NIOSH my budget is \$236,394
- 2010-2015 Co-Investigator, “Investigation and Mitigation of Carbon Nanomaterial Toxicity” NIH/NIEHS my budget is \$42,200

- 2011-2016 Co-Investigator, "Oxygenated Species of Cardiolipin's as Biomarkers of Mitochondrial Dysfunction" NIH my budget is \$225,000
- 2012-2014 Co-Investigator, "Imaging Mass Spectrometry for Oxidized Lipidomics in Acute Lung Injury" NIH my budge is \$150,000
- 2012-2017 Co-Investigator, "Mapping Lipid Oxidation in Traumatic Brain Injury by Mass Spectrometric Imaging" NIH my budget is \$94,127
- 2012-2017 Co-Investigator, "Lipids and Myeloid Cell Function in Cancer" H. Lee Moffitt Cancer Center & Research Institute/NIH my budge is \$85,538

Contracts:

- 1993-1994 PI, Contract from the World's Health Organization (via New York Institute for Medical Research) "Assessment of plasma antioxidant status" within the framework of the WHO project on "Combined utilization of antidepressants and antioxidants in the treatment of therapy resistant depression", \$10,850
- 1994-1996 PI, Contract from Magee-Womens Research Institute, "Plasma antioxidant reserves in pregnant women with preeclampsia", 09/01/94-06/30/95, \$9,300
- 1995-1996 PI, Contract from Safar International Center for Resuscitation Research (the University of Pittsburgh) "Brain antioxidants after cardiac arrest", 07/01/95-06/30/96, \$5,000
- 1998-1999 PI, Contract from Safar International Center for Resuscitation Research (the University of Pittsburgh) "Uncontrolled hemorrhagic shock in rats", 07/01/98-09/30/99, \$4,2000
- 2000-2001 PI, Contract from Bertek Pharmaceuticals, Inc (Foster City, CA) "Effects of Butenafine on peroxisomal enzymatic activities in rat and human hepatocytes", 02/01/00 – 01/30/01, \$19,000
- 2000-2002 PI, Contract from Safar International Center for Resuscitation Research (University of Pittsburgh) "Uncontrolled hemorrhagic shock in rats", \$30,000
- 2011-2013 PI, Contract from Glaxo Klein Smith, \$175,878.

Grants to support postdoctoral training and collaborative research:

- 1993 PI, Grant from Research Development Fund, Office of Research, University of Pittsburgh to support collaborative research with Prof. Peter Quinn (King's College, University of London), \$900
- 1993-1994 PI, Grant from the UNESCO Global Network in Molecular and Cell Biology to support postdoctoral training and collaborative research with Dr. V. Tyurin (I.M. Sechenov Institute of Evolutionary Biochemistry and Physiology, St. Petersburg, Russia), \$2,500
- 1993-1994 PI, Grant from NSF to support visit (postdoctoral training and collaborative research) for Dr. V. Ritov (M.V. Lomonosov Moscow State University, Russia), \$3,800
- 1994 Co-PI, Grant from the Hewlett International Small Grants Program to support visit to Novokuznetsk, Russia to initiate the project "Plasma antioxidant reserves in cokeoven operators of Novokuznetsk Steel Combine", (together with Dr. R. Day, Department of Biostatistics, GSPH) \$2,500
- 1994-1995 Grant from from The Society of Toxicology Graduate Fellowship Award (sponsored by Hoffmann-La Roche, \$12,000);
- 1994-1995 Grant from The Allegheny-Erie Chapter of Society of Toxicology Graduate Fellowship Award for Rado Goldman (\$1,500).
- 1995-1996 Grant from EPA (Graduate Fellowship Award) (\$24,667) to support graduate student, Rado Goldman

- 1995-1996 PI, Grant from the National Science Foundation to support visit of a graduate student R. Goldman to Germany to conduct a collaborative research on fast Kinetics of thiol-phenoxy radicals with Dr. W. Bors (National Laboratory for Radiation Research, Munich), \$4,150
- 1997-2002 Principal Trainer, (M. Pinsky - PI), NIH, Institutional National Research Service Award for Institutional Research Training Grant, \$832,815
- 1998-2000 International Fellowship award from NIH/WHO to support postdoctoral fellow Yulia Tyurina (Russia), 6/1/97-5/31/99, \$59,200
- 1999-2000 Magee-Womens Research Institute Fellowship award to support postdoctoral training of Dr. Vladimir Tyurin
- 2000-2002 Seed grant from the Department of Anesthesiology and Critical Care Medicine, University Pittsburgh, Dr. Hulya Bayir, MD.
- 2000-2001 Award from the Ministry of Education and Science of Spain to support training and research of Dr. Antonio Arroyo
- 2002-2004 International Fellowship award from NIH NINDS/WHO to support postdoctoral Fellow Gregory Borisenko (Russia), 02/1/02-1/31/04, \$98,000
- 2007 Mentored Clinical Scientist Research Career Development Award Application for grant proposal entitled, "Oxidative stress in regional cerebral blood flow Alterations after cardiac arrest" of Dr. Mioara D. Manole

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 Chairman, Departmental Admission Committee, Graduate School of Public Health, University of Pittsburgh

Member, Subcommittee on Molecular Toxicology, Environmental and Occupational Health, Departmental Committee, University of Pittsburgh

Chairman, Departmental ad hoc Committee on Chemoprevention, Department of Environmental and Occupational Health, University of Pittsburgh

Member, Department of Environmental and Occupational Health, Promotion and Advancement Committee

Member, Promotions and Appointment Committee, Department of Environmental and Occupational Health

School

Member, GSPH Faculty Appointment Promotion and Tenure Committee

Member, GSPH Planning and Budget Policies Committee

University

Member, Admission Committee, Integrated Interdisciplinary Biomedical Graduate Program, School of Medicine/Graduate School of Public Health

Member, STEP Committee, Integrated Interdisciplinary Biomedical Graduate Program, School of Medicine/Graduate School of Public Health

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National Science Foundation
National Institutes of Health
International Science Foundation
National Research Counsel of Singapore
International Coenzyme Q Association
Competitive Medical Research Fund, UPMC, University of Pittsburgh
Technology Transfer Committee, University of Pittsburgh