

CURRICULUM VITAE

NAME: **Valerian E. Kagan**

BUSINESS ADDRESS: Department of Environmental and Occupational Health
University of Pittsburgh
Graduate School of Public Health
130 DeSoto St., Room 1420
Pittsburgh, PA 15261

PHONE: (412) 624-9479

FAX: (412) 624-9361

EMAIL: kagan@pitt.edu

EDUCATION AND TRAINING

Undergraduate

MV Lomonosov Moscow State University Russia	B.S.	1967	Biochemistry, Biophysics
MV Lomonosov Moscow State University Russia	M.S.	1968	Biochemistry, Biophysics

Graduate

MV Lomonosov Moscow State University Russia	Ph.D.	1972	Biochemistry, Biophysics
USSR Academy of Sciences, Moscow, Russia	D.Sc.	1981	Biochemistry, Biophysics

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
1989-1992	Associate Research Biochemist	University of California, Berkeley Department of Molecular and Cell Biology
1989-1992	Visiting Scientist	Lawrence Berkeley Laboratory, Berkeley
1992-1996	Associate Professor	University of Pittsburgh, Department of Environmental and Occupational Health
1996-2001	Associate Professor (tenured)	University of Pittsburgh, Department of Environmental and Occupational Health
1992-Present	Member	University of Pittsburgh Cancer Institute
1997-2003	Associate Professor	University of Pittsburgh, Department of Pharmacology, Pittsburgh, PA
1999-2002	Associate Investigator	Magee-Womens Research Institute, Pittsburgh, PA

1999-2012	Adjunct Professor	Division of Life Sciences, King's College, University of London, UK
2000-Present	Vice-Chairman	Department of Environmental and Occupational Health, University of Pittsburgh
2001-Present	Professor	Department of Environmental and Occupational Health, University of Pittsburgh
2002-Present	Senior Investigator	Magee-Womens Research Institute, Pittsburgh, PA
2003-Present	Professor	Department of Pharmacology, University of Pittsburgh
2004-Present	Director	Center for Free Radical and Antioxidant Health, University of Pittsburgh
2005-Present	Professor	School of Medicine, Department of Department of Pharmacology and Chemical Biology, University of Pittsburgh
2006-Present	Member	University of Pittsburgh Nanotechnology Institute
2006-Present	Member	University of Pittsburgh Drug Discovery Institute
2007-2013	Adjunct Foreign Professor	Institute of Environmental Medicine, Karolinska Institute, Stockholm, Sweden
2007-Present	Professor	Department of Radiation Oncology, School of Medicine, University of Pittsburgh
2010-Present	Professor	Department of Chemistry, University of Pittsburgh
2010-Present	Professor	Taipei Medical University, Taiwan
2010-Present	Professor	Russian State Medical University, Moscow, Russia
2010-Present	Foreign Professor	MV Lomonosov Moscow State University Moscow, Russia
2011-Present	Member Faculty	McGowan Institute for Regenerative Medicine, UPMC, University of Pittsburgh
2013-2014	Fulbright Visiting Chair	Environmental Sciences, McMaster University, Hamilton, Ontario, Canada
2014-2015	Sackler Lecturer	University of Tel-Aviv, Israel
2018-2020	Head	Laboratory of Navigational Redox Lipidomics, IM Sechenov State Medical University, Moscow, Russia
2020-present	Professor-consultant	Institute for Regenerative Medicine, IM Sechenov State Medical University, Moscow, Russia

ADDITIONAL TEMPORARY APPOINTMENTS

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

HONORS

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 Elected Fellow, The American Association for the Advancement of Science
- 2017 Science and Humanity Award from the Society for Free Radical Research Europe and Oxygen Club of California
- 2019 Honorary Clinical Lecture and Award from the Society. For Free Radical Research-Europe

PUBLICATIONS

BOOKS IN ENGLISH:

1. **Kagan, V.E.** Lipid peroxidation in biomembranes, CRC Press, Boca Raton, Florida, 1-184, 1988.
2. Quinn, P.J., **Kagan, V.E.** (Eds). Subcellular Biochemistry: fat-soluble vitamins. Plenum Publishing Corp., N.Y., London, 1998.
3. **Kagan, V.E.**, Quinn, P.J. (Eds). Coenzyme Q: molecular mechanisms in health and disease. CRC Press, Boca Raton, 2001.
4. 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 VE**, Shvedova AA, Novikov KN, and Kozlov YP. Light-induced free radical oxidation of membrane lipids in photoreceptor of frog retina. *Biochim. Biophys. Acta.* 1973; 330:76-79.
2. Krasnovsky AA, and **Kagan VE**. Photosensitization and quenching of singlet oxygen by pigments and lipids of photoreceptor cells of the retina. *FEBS Lett.* 1979; 108(1):152-154.
3. Tyurin VA, **Kagan VE**, Shukolyukov SA, Klaan NK, Novikov KN, Azizova OA. Thermal stability of rhodopsin and lipid-protein interactions in the photoreceptor membranes of homoiothermic and poikilothermic animals. *J. Therm. Biol.* 1979; 4:203-208.
4. Shvedova AA, Sidorov AS, Novikov KN, Galuschenko IV, **Kagan VE**. Lipid peroxidation and electric activity of the retina. *Vision Res.* 1979; 19:49-55.
5. Meerson FZ, **Kagan VE**, Kozlov YP, Belkina LM, Arkhipenko YV. Role of lipid peroxidation in pathogenesis of ischemic damage and antioxidant protection of the heart. *Basic Res. Cardiol.* 1982; 77:465-485.
6. Shvedova AA, Alekseeva OM, Kuliev IY, Muranov KO, Kozlov YP, **Kagan VE**. Damage of photoreceptor membrane lipids and proteins induced by photosensitized oxidation. *Curr. Eye Res.* 1983; 2,10:683-690.
7. Krasnovsky AA, **Kagan VE**, Minin AA. Quenching of single oxygen luminescence by fatty acids and lipids. Contribution of physical and chemical mechanisms. *FEBS Lett.* 1983; 155(2):233-236.
8. Erin AN, Skrypin MM, Tabidze LV, **Kagan VE**. Formation of alpha-tocopherol complexes with fatty acids. A hypothetical mechanisms of stabilization of biomembranes by vitamin E. *Biochim. Biophys. Acta.* 1984; 774:96-102.

9. Erin AN, Spirin MM, Tabidze LV, **Kagan, VE**. Formation of alpha-tocopherol complexes with fatty acids. Nature of complexes. *Biochim. Biophys. Acta*. 1985; 815:209-214.
10. **Kagan VE**, Serbinova EA, Novikov KN, Ritov VB, Kozlov YP, Stoytchev TS. Toxic and protective effects of antioxidants in biomembranes. *Arch. Toxicol. (Suppl.)*, 1986; 9:302-305.
11. **Kagan VE**, Quinn PJ. The interaction of alpha-tocopherol and homologues with shorter hydrocarbon chains with phospholipid bilayer dispersions. A fluorescence probe study. *Eur. J. Biochem*. 1988; 171(3):661-667.
12. Baldenkov GN, Serbinova EA, Bakalova RA, Tkachuk VA, **Kagan VE**, Stoychev TS. The role of secondary messengers in the regulation of lipid peroxidation in rat liver microsomes. *Free Rad. Res. Commun.* 1988; 4(5):277-281.
13. **Kagan VE**, Bakalova RA, Rangelova DS, Stoyanovsky DA, Koynova GM, Wolinsky I. Oxidative stress leads to inhibition of calcium transport by sarcoplasmic reticulum in skeletal muscle. *Proc. Soc. Exp. Biol. Med.* 1989; 190:365-368.
14. Serbinova EA, Kadiiska MB, Bakalova RA, Koynova GM, Stoyanovsky DA, Karakashev PC, Stoytchev TS, Wolinsky I, **Kagan VE**. Lipid peroxidation activation and cytochrome P-450 decrease in rat liver endoplasmic reticulum under oxidative stress. *Toxicol. Lett.* 1989; 47:119-123.
15. **Kagan VE**, Bakalova RA, Serbinova EA, Stoytchev TS. Fluorescent measurements of incorporated and hydrolysis of tocopherol and its esters in biomembranes. *Meth. Enzymol.* 1989; 186:355-367.
16. Packer L, Maguire JJ, Melhorn RJ, Serbinova EA, **Kagan VE**. Mitochondria and microsomal membranes have a free radical reductase activity that prevents chromanoxyl radical accumulation. *Biochem. Biophys. Res. Commun.* 1989; 159(1):229-235.
17. Stoyanovsky DA, **Kagan VE**, Packer L. Iron binding to α -tocopherol-containing phospholipid liposomes. *Biochem. Biophys. Res. Commun.* 1989; 160(2):834-838.
18. **Kagan VE**. Tocopherol stabilizers membrane against phospholipases A, free fatty acids and lysophospholipids. *Ann. N.Y. Acad. Sci.* 1989; 570:121-135.
19. **Kagan VE**, Serbinova EA, Packer L. Recycling and antioxidant activity of tocopherol homologues of differing hydrocarbon chain length in liver microsomes. *Arch. Biochem. Biophys.* 1990; 282(2):221-225.
20. **Kagan VE**, Bakalova RA, Zhelev ZhZh, Rangelova D.A, Serbinova EA, Tyurin VA, Denisova NK, Packer L. Intermembrane transfer and antioxidant action of alpha-tocopherol in liposomes. *Arch. Biochem. Biophys.* 1990; 280(1):147-152.
21. **Kagan VE**, Serbinova EA, Packer L. Generation and recycling of radicals from phenolic antioxidants. *Arch. Biochem. Biophys.* 1990; 280(1):33-39.
22. **Kagan VE**, Serbinova EA, Koynova EA, Kitanova SA, Tyurin VA, Stoytchev TS, Quinn PJ, Packer L. Antioxidant action of ubiquinol homologues with different isoprenoid chain length in biomembranes. *Free Rad. Biol. Med.* 1990; 9:117-126.
23. **Kagan VE**, Serbinova EA, Packer L. Antioxidant effects of ubuquinones in microsomes and mitochondria are mediated by tocopherol recycling. *Biochem. Biophys. Res. Commun.* 1990; 169(3):851-857.

24. **Kagan VE**, Serbinova EA, Bakalova RA, Stoytchev TS, Erin AN, Prilipko LL, Evstigneeva RP. Mechanisms of stabilization of biomembranes by alpha-tocopherol: the role of the hydrocarbon chain in the inhibition of lipid peroxidation. *Biochem. Pharmacol.* 1990; 40(11):2403-2413.
25. Konishi T, **Kagan VE**, Matusg, 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-naphtalene-tetra-carboxylic-diimide (NP-III). *Biochem. Biophys. Res. Comm.* 1991; 175(1):129-133.
26. Serbinova EA, **Kagan VE**, Han D, Packer L. Intramembrane mobility and recycling in antioxidant properties of alpha-tocotrienol. *Free Rad. Biol. Med.* 1991; 10:263-275.
27. Packer L, Valenza M, Serbinova EA, Starke-Reed P, Frost K, **Kagan VE**. Free radical scavenging is involved in the protective effect of 1-propionyl-carnitine against ischemia-reperfusing injury of the heart. *Arch. Biochem. Biophys.* 1991; 288(2):533-537.
28. **Kagan VE**, Freisleben HJ, 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.* 1991; 15:273-284.
29. Maguire JJ, **Kagan VE**, Serbinova EA, Ackrell BA, Packer L. Succinate-ubiquinone reductase-linked recycling of alpha-tocopherol in reconstituted systems and mitochondria: requirement for reduced ubiquinone. *Arch. Biochem. Biophys.* 1992; 229:47-53.
30. **Kagan VE**, 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.* 1992; 16:51-64.
31. **Kagan VE**, Serbinova EA, Forte T, Scita G, Packer L. Recycling of vitamin E in human low density lipoproteins. *J. Lipid Res.* 1992; 33:385-397.
32. Reznick AZ, **Kagan VE**, Ramsey R, Tsuchiya M, Khwaja S, Serbinova EA, 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.* 1992; 296:394-401.
33. **Kagan VE**, Serbinova EA, Safadi A, Catudioc J, Packer L. NADPH-dependent inhibition of lipid peroxidation in rat liver microsomes. *Biochem. Biophys. Res. Commun.* 1992; 86:74-80.
34. **Kagan VE**, Shvedova A, Serbinova EA, 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.* 1992; 44:1637-1649.
35. Suzuki YJ, Tsuchiya M, Safadi A, **Kagan VE**, Packer L. Antioxidant properties of nitecapone (OR-462). *Free Radical Biol. Med.* 1992; 13:517-525.
36. Maguire JJ, **Kagan VE**, Packer L. Electron transport between cytochrome c and alpha-tocopherol. *Biochem. Biophys. Res. Commun.* 1992; 188:190-197.
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.* 1992; 213:460-72.
38. **Kagan VE**, Tsuchiya M, Serbinova E, Packer L, Sies H. Interaction of the pyridoindole stobadine

with peroxy, superoxide and chromanoxyl radicals. *Biochem. Pharmacol.* 1993; 45:393-400.

39. Chatelain E, Boscoboinik DO, Bartoli GM, **Kagan VE**, Gey FK, Packer L, Azzi A. Inhibition of smooth muscle cell proliferation and protein kinase C activity by tocopherols and tocotrienols. *Biochim. Biophys. Acta.* 1993; 1176:83-89.
40. Suzuki Y, Tsuchiya M, Wassall S, Choo Y, Govil G, **Kagan V**, Packer L. Structural and dynamic membrane properties of α -tocopherol and α -tocotrienol: implication to the molecular mechanism of their antioxidant potency. *Biochemistry.* 1993; 32:10692-10699.
41. Stoyanovsky D, Yalowich J, Gantchev T, **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. Commun.* 1993; 19:371-386.
42. Gantchev TG, van Lier JE, Stoyanovsky DA, Yalowich JC, **Kagan VE**. 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.* 1994; 234:643-654.
43. **Kagan VE**, Packer L. Light-induced generation of the vitamin E radicals: a new method to assess vitamin E regeneration. *Meth. Enzymol* 1994; 234:316-320.
44. **Kagan VE**, Serbinova EA, Stoyanovsky DA, Khwaja S, Packer L. Assay of ubiquinones and ubiquinols as antioxidants. *Meth. Enzymol.* 1994; 234:343-354.
45. Tsuchiya M, **Kagan VE**, Freisleben HJ, Manabe M, Packer L. Antioxidant activity of α -tocopherol, β -carotene and ubiquinol in membranes: cis-parinaric acid-incorporated liposomes. *Meth. Enzymol.* 1994; 234:371-383.
46. Stoyanovsky DA, Salama G, **Kagan VE**. Ascorbate/iron activates Ca^{2+} -release channels of skeletal sarcoplasmic reticulum vesicles reconstituted in lipid bilayers. *Arch. Biochem. Biophys.* 1994; 308:214-221.
47. Schwarz MA, Lazo JS, Yalowich JC, Reynolds I, **Kagan VE**, Tyurin VA, Kim YM, Watkins S, Pitt B. Cytoplasmic metallothionein overexpression protects NIH 3T3 cells from tert-butyl hydroperoxide toxicity. *J. Biol. Chem.* 1994; 269:15238-15243.
48. Avrova NF, Tyurin VA, Tyurina YY, **Kagan VE**. Gangliosides in postischemic cellular dysfunctions. *Ann. NY Acad. Sci.* 1994; 723:353-355.
49. **Kagan VE**, Yalowich JC, Day BW, Goldman RR, Stoyanovsky DA. 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.* 1994; 33:9651-9660.
50. Engelman DT, Watanabe M, Engelman RM, Rousou JA, Kisin ER, **Kagan VE**, Das DK. Hypoxic preconditioning preserves antioxidant reserve and prevents calcium overload in the ischemic/reperfused working heart. *Cardiovasc. Res.* 1995; 29:133-140.
51. Tyurina YY, Tyurin VA, Yalowich JC, Quinn PJ, Claycamp HG, Schor NF, Pitt BR, **Kagan VE**. Phenoxyl radicals of etoposide (VP-16) can directly oxidize intracellular thiols: protective versus damaging effects of phenolic antioxidants. *Toxicol. Appl. Pharmacol.* 1995; 131: 277-288.
52. Menshikova EV, Ritov VB, Shvedova AA, Elsayed NM, Karol MH, **Kagan VE**. Pulmonary microsomes contain a Ca^{2+} -transport system sensitive to oxidative stress. *Biochim. Biophys. Acta.* 1995; 1228:165-174.

53. Stoyanovsky DA, Goldman R, Organisciak DT, Darrow RM, **Kagan VE**. Endogenous ascorbate regenerates vitamin E in the retina directly and in combination with dihydrolipoic acid. *Curr. Eye Res.* 1995; 14:181-189.
54. Stoyanovsky DA, Goldman R, Claycamp HG, **Kagan VE**. Phenoxyl radical-induced thiol-dependent generation of reactive oxygen species: implications for benzene toxicity. *Arch.Biochem.Biophys.* 1995; 317:315-323.
55. Shvedova AA, Kisin ER, **Kagan VE**, Karol MH. Increased lipid peroxidation and decreased antioxidants in lungs of guinea pigs following an allergic pulmonary response. *Toxicol.Appl.Pharmacol.* 1995; 132:72-81.
56. Goldman R, Stoyanovsky DA, Day BW, **Kagan VE**. Reduction of phenoxyl radicals by thioredoxin results in selective oxidation of its SH-groups to disulfides. *Biochemistry.* 1995; 34: 4765-4772.
57. Shvedova AA, Menshikova EV, Ritov VB, **Kagan VE**, Karol MH. Murine pulmonary Ca²⁺-transport system activated by allergic immune response retains sensitivity to oxidative stress. *Exp. Lung Res.* 1995; 21:743-769.
58. Gorbunov NV, Osipov AN, Day BW, Zayas-Rivera B, **Kagan VE**, Elsayed NM. Reduction of ferrylmyoglobin and ferrylhemoglobin by nitric oxide: a protective mechanism against ferryl hemoprotein-induced oxidations. *Biochemistry.* 1995; 34:6689-6699.
59. Jones DP, **Kagan VE**, Aust SD, Reed DJ, Omaye ST. Impact of nutrients on cellular lipid peroxidation and antioxidant defense system. *Fund.Appl. Toxicol.* 1995; 26(1):1-7.
60. Ritov VB, Goldman R, Stoyanovsky DA, Menshikova EV, **Kagan VE**. Antioxidant paradoxes of phenolic compounds: peroxy radical scavenger and lipid antioxidant, Etoposide (VP-16), inhibits sarcoplasmic reticulum Ca²⁺-ATPase via thiol oxidation by its phenoxyl radical. *Arch. Biochem. Biophys.* 1995; 321:140-152.
61. Maulik N, Watanabe M, Engelman D, Engelman RM, **Kagan VE**, Kisin E, Tyurin VA, Cordis GA, Das DK. Myocardial adaptation to ischemia by oxidative stress induced by endotoxin. *Am. J. Physiol., Cell Physiol.* 1995; 38:907-916.
62. Stoyanovsky DA, Osipov AN, Quinn PJ, **Kagan VE**. Ubiquinone-dependent recycling of vitamin E radicals by superoxide. *Arch. Biochem. Biophys.* 1995; 323:343-351.
63. Kurella EG, Osipov AN, Goldman R, Boldyrev AA, **Kagan VE**. Inhibition of Na,K-ATPase by phenoxyl radicals of etoposide (VP-16): role of sulfhydryls oxidation. *Biochim. Biophys. Acta.* 1995; 1232:52-58.
64. Elsayed NM, Tyurina YY, Tyurin VA, Menshikova EV, Kisin ER, **Kagan VE**. Antioxidant depletion, lipid peroxidation, and impairment of calcium transport induced by air blast overpressure in rat lungs. *Exp. Lung Res.* 1996; 22:179-200.
65. Yalowich JC, Tyurina YY, Tyurin VA, Allan WP, **Kagan VE**. 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.* 1996; 10:59-68.
66. Winer RI, Novikov KN, Ritov VB, **Kagan V.**, Alterman MA. 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.* 1996; 217:886-891.

67. Gorbunov NV, Osipov AN, Sweetland MA, Day BW, Elsayed NM, **Kagan VE**. NO redox paradox: direct oxidation of α -tocopherol and α -tocopherol-mediated oxidation of ascorbate. *Biochem. Biophys. Res. Commun.* 1996; 219:835-841.
68. Stoyanovsky DA, Goldman R, Jonnalagadda SS, Day BW, Claycamp HG, **Kagan VE**. 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.* 1996; 330:3-11.
69. Osipov AN, Gorbunov NV, Day BW, Elsayed NM, **Kagan VE**. Electron spin resonance and mass spectral analysis of interactions of ferrylhemoglobin and ferrylmyoglobin with nitric oxide. *Meth. Enzymol.* 1996; 268:193-203.
70. Hubel CA, Kozlov AV, **Kagan VE**, Evans RW, Davidge ST, McLaughlin MK, Roberts JM. Decreased transferrin and increased transferrin saturation in sera of women with preeclampsia: implications for oxidative stress. *Amer. J. Obst. Gynecol.* 1996; 175:672-700.
71. Purpura P, Westman L, Will P, Eidelman A, **Kagan VE**, Osipov AN, Schor NF. Adjunctive treatment of murine neuroblastoma with 6-hydroxydopamine and TEMPOL. *Cancer Res.* 1996; 56: 2336-2342.
72. **Kagan VE**, Day BW, Elsayed NM, Gorbunov NV. Dynamics of nitrosylated hemoglobin in blood. *Nature.* 1996; 383:30-31.
73. Ritov VB, Menshikova EV, Goldman R, **Kagan VE**. 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.* 1996; 87:121-129.
74. Ritov VB, Banni S, Yalowich JC, Day BW, Claycamp HG, Corongiu FP, **Kagan VE**. Non-random peroxidation of different classes of membrane phospholipids in live cells detected by metabolically integrated *cis*-parinaric acid. *Biochim. Biophys. Acta.* 1996; 1283:127-140.
75. Muldoon MF, Kritchevsky SB, Evans RW, **Kagan VE**. Serum total antioxidant activity in relative hypo- and hypercholesterolemia. *Free Radical Res.* 1996; 25:239-245.
76. Maulik N, Engelman DT, Watanabe M, Engelman RM., Rousou JA, Flack JA, Deaton DW, Gorbunov NV, Elsayed NM, **Kagan VE**, Das DK. Nitric oxide/carbon monoxide: a molecular switch for myocardial preservation during ischemia. *Circulation.* 1996; 94: II-398-II406.
77. Gorbunov NV, Elsayed NM, Kisin ER, Kozlov AV, **Kagan VE**. Air blast overpressure induces oxidative stress in rat lungs: interplay between hemoglobin, antioxidants and lipid peroxidation. *Am. J. Physiol.: Lung Cell. Molec. Physiol.* 1997; 16(2):L 320-L 334.
78. Fabisiak JP, **Kagan VE**, Ritov VB, Johnson DE, Lazo JS. Bcl-2 inhibits selective oxidation and externalization of phosphatidylserine during paraquat-induced apoptosis. *Am. J. Physiol.: Cell Physiol.* 1997; 41(2):C 675-C 684.
79. Tyurin VA, Carta G, Tyurina YY, Banni S, Day BW, Corongiu FP, **Kagan VE**. Peroxidase-catalyzed oxidation of β -Carotene in HL-60 cells and in model systems: involvement of phenoxyl radicals. *Lipids.* 1997; 32(2):131-142.
80. Osaka K, Ritov VB, Bernardo JF, Branch RA, **Kagan VE**. Amphotericin B protects *cis*-parinaric acid against peroxy radical-induced oxidation: amphotericin B as an antioxidant. *Antimicrob. Agents and Chemother.* 1997; 41(4):743-747.

81. Goldman R, Tsyrlow IB, Grogan J, **Kagan VE**. Reactions of phenoxyl radicals with NADPH-cytochrome P-450 reductase and NADPH: reduction of the radicals and inhibition of the enzyme. *Biochemistry*. 1997; 36(11):3186-3192.
82. Gorbunov NV, Yalowich JC, Gaddam AS, Thampatty P, Kisin ER, Elsayed NM, **Kagan VE**. 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.* 1997; 272:12328-12341.
83. Goldman R, Bors W, Michel M, Day BW, **Kagan VE**. Environmental and nutritional phenols: bioactivation to phenoxyl radicals and their cytotoxic and/or protective interactions with intracellular reductants. *Env. Nutr. Interactions*. 1997; 1(2):97-118.
84. Hubel CA, **Kagan VE**, Kisin ER, McLaughlin MK, Roberts JM. Increased ascorbyl radical production and ascorbate depletion in plasma from women with preeclampsia: implications for oxidative stress. *Free Radical Biol. Med.* 1997, 23(4):596-609.
85. Craven PA, DeRubertis FR, **Kagan VE**, Melhem M, Studer RK. Effects of supplementation with vitamin C or E on albuminuria, glomerular TGF β and size in diabetes. *J. Am. Soc. Nephrol.* 1997; 8: 1405-1414.
86. Tyurina YY, Tyurin VA, Carta G, Quinn PJ, Schor NF, **Kagan VE**. Direct evidence for antioxidant effect of Bcl-2 in PC-12 rat pheochromocytoma cells. *Arch. Biochem. Biophys.* 1997; 344:413-423.
87. Osaka K, Tyurina YY, Dubey RK, Tyurin VA, Ritov VB, Quinn PJ, Branch RA, **Kagan VE**. 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.* 1997; 54:937-945.
88. Elsayed NM, Gorbunov NM, **Kagan VE**. A proposed biochemical mechanism involving hemoglobin for blast overpressure-induced injury. *Toxicology*. 1997; 121:81-90.
89. Maulik G, Maulik N, Bhandari V, **Kagan VE**, Pakrashi S, Das DK. Evaluation of antioxidant effectiveness of a few herbal plants. *Free Radical Res.* 1997; 27(2):221-228.
90. Pitt BR, Schwarz M, Woo ES, Yee E, Wasserloos K, Tran S, Weng W, Mannix RJ, Watkins SA, Tyurina YY, Tyurin VA, **Kagan VE**, Lazo JS. Over-expression of metallothionein decreases the sensitivity of pulmonary endothelial cells to oxidant injury. *Am. J. Physiol.: Lung Cell. Mol. Physiol.* 1997; 17(4):L 856-L 865.
91. Omaye ST, Krinsky NI, **Kagan VE**, Mayne ST, Liebler DT, Bidlack WR. β -Carotene: friend or foe? *Fund. Appl. Toxicol.* 1997; 40:163-174.
92. Maulik N, **Kagan VE**, Tyurin VA, Das DK. Redistribution of membrane phosphatidylethanolamine and phosphatidylserine precedes the reperfusion-induced apoptosis in heart. *Am. J. Physiol.: Heart Circul. Physiol.* 1998; 43(1):H 242-H 248.
93. Gorbunov NV, Tyurina YY, Salama G, Day BW, Claycamp HG, Argyros G, Elsayed NM, **Kagan VE**. Nitric oxide protects cardiomyocytes against tert-butyl hydroperoxide-induced formation of alkoxyl and peroxy radicals and peroxidation of phosphatidylserine. *Biochem. Biophys. Res. Commun.* 1998; 244:647-651.
94. Fabisiak JP, **Kagan VE**, Tyurina YY, Tyurin VA, Lazo JS. Paraquat-induced phosphatidylserine

oxidation and apoptosis is independent of activation of phospholipase A2. *Am. J. Physiol.: Lung Cell. Molec. Physiol.* 1998; 18(5):L 793-L 802.

95. Katz LM, Callaway CW, **Kagan VE**, Kochanek PM. ESR measure of brain antioxidant activity during ischemia/reperfusion. *Neuroreport.* 1998; 9(7):1587-1593.
96. **Kagan VE**, Arroyo A, Tyurin VA, Tyurina YY, Villalba JM, Navas P. Plasma membrane NADH-coenzyme Q₀ reductase generates semiquinone radicals and recycles vitamin E homologue in a superoxide-dependent reaction. *FEBS Lett.* 1998, 428:43-46.
97. **Kagan VE**, Tyurina YY. Recycling and redox cycling of phenolic antioxidants. *Ann. N.Y. Acad. Sci.* 1998; 854:425-434.
98. Tyurin VA, Tyurina YY, Quinn PJ, Schor NF, Balachandran R, Day BW, **Kagan VE**. Glutamate-induced cytotoxicity in PC12 pheochromocytoma cells: role of oxidation of phospholipids, glutathione and protein sulfhydryls revealed by *bcl-2* transfection. *Mol. Brain Res.* 1998; 60:270-281.
99. Fabisiak JP, Tyurina YY, Tyurin VA, Lazo JS, **Kagan VE**. Random versus selective membrane phospholipid oxidation in apoptosis: role of phosphatidylserine. *Biochemistry.* 1998; 37:13781-13790.
100. Shvedova AA, Tyurina YY, Gorbunov NV, Tyurin VA, Castranova V, Ojimba J, McLaughlin MK, **Kagan VE**. *tert*-Butyl hydroperoxide/hemoglobin-induced oxidative stress and damage to mesenteric smooth muscle cells: different effects of nitric oxide and nitrosothiols. *Biochem. Pharmacol.* 1999; 57:989-1001.
101. Dubey RK, Tyurina YY, Tyurin VA, Gillespi D, Branch RA, Jackson EK, **Kagan VE**. Estrogen and tamoxifen metabolites protect smooth muscle cell membrane phospholipids against peroxidation and inhibit cell growth. *Circulat. Res.* 1999; 84:229-239.
102. Day BW, Tyurin VA, Tyurina YY, Liu M, Facey JA, Carta G, Kisin ER, Dubey RK, **Kagan VE**. Peroxidase-catalyzed pro- versus anti-oxidant effects of 4-hydroxytamoxifen – enzyme specificity and biochemical sequelae. *Chem. Res. Toxicol.* 1999; 12(1):28-37.
103. Fabisiak JP, Tyurin VA, Tyurina YY, Borisenko GG, Korotaeva A, Pitt BR, Lazo JS, **Kagan VE**. Redox regulation of copper-metallothionein. *Arch. Biochem. Biophys.* 1999; 363:171-181.
104. Quinn PJ, Fabisiak JP, **Kagan VE**. Expansion of antioxidant function of vitamin E by coenzyme Q. *Biofactors.* 1999; 9:149-154.
105. Shvedova AA, Osipov AN, Jeffries BA, Kommineni C, Vallyathan V, Castranova V, **Kagan VE**. Peroxidase/H₂O₂ enhances hypersensitivity responses induced by eugenol: inhibitory effect of an antioxidant, lipoic acid. *Env. Nutr. Interactions.* 1999; 3:15-32.
106. Schor NF, Tyurina YY, Fabisiak JP, Tyurin VA, Lazo JS, **Kagan VE**. Bcl-2-induced potentiation of apoptosis: enhancement of reducing potential and externalization of membrane phosphatidylserine. *Brain Res.* 1999; 831:125-130.
107. Menshikova EV, Ritov VB, Gorbunov NV, Salama G, Claycamp HG, **Kagan VE**. Nitric oxide prevents myoglobin/*tert*-butyl hydroperoxide-induced inhibition of Ca²⁺-transport in skeletal and cardiac sarcoplasmic reticulum. *Ann. N.Y. Acad. Sci.* 1999; 874:371-385.
108. **Kagan VE**, Yalowich JC, Borisenko GG, Tyurina YY, Tyurin VA, Thampatty P, Fabisiak JP.

Mechanism-based chemopreventive strategies against etoposide-induced acute myeloid leukemia: free radical/antioxidant approach. *Mol. Pharmacol.* 1999; 56:494-506.

109. Schor NF, Tyurina YY, Tyurin VA, **Kagan VE**. Differential antioxidant effects of immediate and long-term estradiol treatment of MCF-7 breast cancer cells. *Biochem. Biophys. Res. Comm.* 1999; 260: 410-415.
110. Fabisiak JP, Pearce LL, Borisenko GG, Tyurina YY, Tyurin VA, Razzack J, Lazo JS, Pitt BR, **Kagan VE**. Bifunctional anti-/prooxidant potential of metallothionein: redox- signaling of copper binding and release. *Antiox. Redox Signal.* 1999; 1:349-364.
111. Yalowich JC, Gorbunov NV, Kozlov AV, Allan W, **Kagan VE**. Mechanisms of nitric oxide protection against *tert*-butyl hydroperoxide-induced cytotoxicity in iNOS-transduced human erythroleukemia cells. *Biochemistry.* 1999; 38:10691-10698.
112. Lange RW, Day BW, Lemus R, Tyurin VA, **Kagan VE**, Karol MH. Intracellular S-glutathionyl adducts in murine lung and human bronchoepithelial cells after exposure to diisocyanatotoluene. *Chem. Res. Toxicol.* 1999; 12:931-936.
113. Goldman R, Claycamp HG, Sweetland MA, Sedlov AV, Tyurin VA, Kisin ER, Tyurina Y, Ritov, VB, Wenger SL, Grant SG, **Kagan VE**. Myeloperoxidase-catalyzed redox-cycling of phenol promotes lipid peroxidation and thiol oxidation in HL-60 cells. *Free Radical Biol. Med.* 1999; 27:1050-1063.
114. Fabisiak JP, Tyurin VA, Tyurina Y, Sedlov AV, Lazo JS, **Kagan VE**. Nitric oxide dissociates lipid oxidation from apoptosis and phosphatidylserine externalization during oxidative stress. *Biochemistry.* 2000; 39:127-138.
115. Shvedova AA, Kommineni C, Jeffries BA, Castranova V, Tyurina YY, Tyurin VA, Serbinova EA, Fabisiak JP, **Kagan VE**. Redox-cycling of phenol induces oxidative stress in human epidermal keratinocytes. *J. Invest.Dermatol.* 2000; 114:354-364.
116. Schor NF, Rudin CM, Hartman AR, Thompson CB, Tyurina YY, **Kagan VE**. Cell line dependence of Bcl-2-induced alteration of glutathione handling. *Oncogene.* 2000; 19: 472-476.
117. Boota A, Johnson B, Lee K, Blaskovich MA, Hamilton A, Liu SX, **Kagan VE**, Pitt B, Davies P. Superoxide production by pulmonary vascular smooth muscle cells requires farnesylated and geranylgeranylated proteins. *Am.J.Physiol.: Lung Cel.Mol.Physiol.* 2000; 278:L329-L334.
118. Borisenko GG, **Kagan VE**, Hsia CJC, Schor NF. Interaction between 6-hydroxydopamine and transferrin: "let my iron go." *Biochemistry.* 2000; 39:3392-3400.
119. Fabisiak JP, Ritov VB, **Kagan VE**. Reversible thiol-dependent activation of ryanodine-sensitive Ca²⁺ release channel (RyR) by etoposide (VP-16) phenoxyl radical. *Antiox. Redox Signal.* 2000; 2:73-82.
120. **Kagan VE**, Kuzmenko AA, Shvedova AA, Kisin ER, Tyurina YY, Yalowich JC. 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.* 2000; 270:1086-1092.
121. Tyurina YY, Shvedova AA, Kawai K, Tyurin VA, Kommineni C, Quinn PJ, Schor NF, Fabisiak JP, **Kagan VE**. Phospholipid signaling in apoptosis: peroxidation and externalization of phosphatidylserine. *Toxicol.* 2000; 148:93-101.

122. Arroyo A, **Kagan VE**, Tyurin VA, Burgess JR, de Cabo R, Navas P, Villalba JM. NADH and NADPH-dependent reduction of coenzyme Q at the plasma membrane. *Antiox. Redox Signal.* 2000; 2:251-262.
123. **Kagan VE**, Fabisiak JP, Quinn PJ. Coenzyme Q and vitamin E need each other as antioxidants. *Protoplasma.* 2000; 214:11-18.
124. **Kagan VE**, Fabisiak JP, Shvedova AA, Tyurina YY, Tyurin VA, Schor NF, Kawai K. Oxidative signaling pathway for externalization of plasma membrane phosphatidylserine during apoptosis. *FEBS Lett.* 2000; 477:1-7.
125. Tyurin VA, Tyurina YY, Borisenko GG, Sokolova TV, Ritov VB, Quinn PJ, Rose M, Kochanek P, Graham SH, **Kagan VE**. Oxidative stress following traumatic brain injury in rats: Quantitation of biomarkers and detection of free radical intermediates. *J. Neurochem.* 2000; 75:2178-2189.
126. Liu SX, Fabisiak JP, Tyurin VA, Borisenko GG, Pitt BR, Lazo JS, **Kagan VE**. Redox regulation of copper delivery by metallothioneins: reconstitution of apo-superoxide dismutase by nitric oxide-induced copper transfer. *Chem Res. Toxicol.* 2000; 13:922-931.
127. Vladimirov YA, Arroyo A, Taylor JM, Tyurina YY, Matsura T, Tyurin VA, **Kagan VE**. Quinolizin-coumarins as physical enhancers of chemiluminescence during lipid peroxidation in live HL-60 cells. *Arch. Biochem. Biophys.* 2000; 384:154-162.
128. Kawai K, Liu SX, Tyurin VA, Tyurina YY, Borisenko GG, Jiang JF, St. Croix, CM, Fabisiak JP, Pitt BR, **Kagan VE**. Antioxidant and anti-apoptotic function of metallothioneins in HL-60 cells challenged with Cu-NTA. *Chem Res. Toxicol.* 2000; 13(12):1275-1286.
129. Liu SX, Kawai K, Tyurin VA, Tyurina YY, Borisenko GG, Fabisiak JP, Pitt BR, **Kagan VE**. Nitric oxide-dependent pro-oxidant and pro-apoptotic effect of metallothioneins in HL-60 cells challenged with cupric nitrilotriacetate. *Biochem. J.* 2001; 354(Pt 2):397-406.
130. Shvedova AA, Tyurina YY, Tyurin VA, Kikuchi Y, **Kagan VE**, Quinn P.J. Quantitative analysis of phospholipid peroxidation and antioxidant protection in live human epidermal keratinocytes. *Biosc. Reports.* 2001; 21:33-43.
131. Tyurin VA, Liu SX, Tyurina YY, Sussman NB, Hubel CA, Roberts JM, Taylor RN, **Kagan VE**. Elevated levels of S-nitrosoalbumin in preeclampsia plasma. *Circ. Res.* 2001; 88:1210-1215.
132. **Kagan VE**, Kozlov AV, Tyurina YY, Shvedova AA, Yalowich JC. Antioxidant mechanisms of nitric oxide against iron-catalyzed oxidative stress in cells. *Antioxid Redox Signal.* 2001; 3:189-202.
133. **Kagan VE**, Laskin JD. Direct and indirect antioxidant effects of nitric oxide: radically unsettled issues. *Antioxid Redox Signal.* 2001; 3:173-175.
134. **Kagan VE**, Tyurin VA, Borisenko GG, Fabisiak JP, Hubel CA, Ness RB, Gandley R, McLaughlin MK, Roberts JM. Mishandling of copper by albumin: Role in redox-cycling and oxidative stress in preeclampsia plasma. *Hypertens. Pregn.* 2001; 20 (3):221-241.
135. Tyurina YY, Tyurin VA, Shvedova AA, Fabisiak JP, **Kagan VE**. Peroxidation of phosphatidylserine in mechanisms of apoptotic signaling. *Meth. Enzymol.* 2002; 352, 159-174.
136. Fabisiak JP, Borisenko GG, Liu SX, Tyurin VA, Pitt BR, **Kagan VE**. Redox sensor function of metallothioneins. *Meth. Enzymol.* 2002; 353:268-281.

137. Tyurin VA, Tyurina YY, Liu SX, Bayir H, Hubel CA, **Kagan VE**. Quantitation of S-nitrosothiols in cells and biological fluids. *Meth. Enzymol.* 2002; 352, 347-360.
138. Greenberger JS, **Kagan VE**, Pearce L, Borisenko GG, Tyurina YY, Epperley MW. Modulation of redox signal transduction pathways in the treatment of cancer. *Antioxid Redox Signal.* 2001; 3:347-359.
139. Epperly MW, **Kagan VE**, Sikora CA, Gretton JE, Defilippi SJ, Bar-Sagi D, Greenberger JS. Manganese superoxide dismutase-plasmid/liposome (MnSOD-PL) administration protects mice from esophagitis associated with fractionated radiation. *Int. J. Cancer.* 2001; 96: 221-231.
140. **Kagan VE**, Kuzmenko AI, Tyurina YY, Shvedova AA, Matsura T, Yalowich JC. Prooxidant and antioxidant mechanisms of etoposide in HL-60 cells: Role of myeloperoxidase. *Cancer Res.* 2001; 61:7777-7784.
141. Behringer W, Safar P, Kentner R, Wu X, **Kagan VE**, Radovsky A, Clark RSB, Kochanek PM, Subramanian M, Tyurin VA, Tyurina YY, Tisherman SA. Antioxidant Tempol enhances hypothermic cerebral preservation during prolonged cardiac arrest in dogs. *J. Cereb. Blood Flow Metab.* 2002; 22: 105-117.
142. Bayir H, **Kagan VE**, Tyurina YY, Tyurin VA, Ruppel RA, Adelson PD, Graham SH, Janesko K, Clark RSB, Kochanek PM. Assessment of antioxidant reserves and oxidative stress in cerebrospinal fluid after severe traumatic brain injury in infants and children. *Pediatr. Res.* 2002; 51:571-578.
143. Shvedova AA, Tyurina YY, Kawai K, Tyurin VA, Kommineni C, Fabisiak JP, **Kagan VE**. Selective peroxidation and externalization of phosphatidylserine in normal human epidermal keratinocytes during oxidative stress induced by cumene hydroperoxide. *J. Invest. Dermatol.* 2002; 118:1008-1018.
144. Koty P, Tyurina YY, Tyurin VA, Liu SX, **Kagan VE**. 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.* 2002; 234-235(1-2):125-133.
145. Modriansky M, Tyurina YY, Tyurin VA, Matsura T, Shvedova AA, Yalowich JC, **Kagan VE**. Anti-/pro-oxidant effects of phenolic compounds in cells: are colchicine metabolites chain-breaking antioxidants? *Toxicol.* 2002; 177:105-117.
146. **Kagan VE**, Kisin ER, Kawai K, Serinkan BF, Osipov AN, Serbinova EA, Wolinsky I, Shvedova AA. Towards mechanism-based antioxidant interventions: lessons from natural antioxidants. *Ann.N.Y.Acad.Sci.* 2002; 959:188-198.
147. **Kagan VE**, Gleiss B, Tyurina YY, Tyurin VA, Elenström-Magnusson C, Liu SX, Serinkan BF, Arroyo A, Chandra J, Orrenius S, 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.* 2002; 169:487-499.
148. Fabisiak JP, Sedlov A, **Kagan VE**. Quantitative fluorescence-based SDS-PAGE assay of oxidative/nitrosative modification of Cys34 in human serum albumin in plasma. *Antioxid Redox Signal.* 2002; 4(5):855-65.
149. Matsura T, Serinkan BF, Jiang J, **Kagan VE**. Phosphatidylserine peroxidation/ externalization during staurosporine-induced apoptosis in HL-60 cells. *FEBS Lett.* 2002; 524: 25-30.

150. Jiang J, St. Croix CM, Sussman N, Zhao Q, Pitt BR, **Kagan VE**. 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.* 2002; 15:1080-1087.
151. Ritov VB, Kelley DE, **Kagan VE**. Optimized derivatization of F2-isoprostanes with 1-pyrenyl-diazomethane for their subsequent determination by fluorescence HPLC. *Analyt. Biochem.* 2002; 311: 10-18.
152. Arroyo A, Modriansky M, Serinkan FB, Bello RI, Matsura T, Jiang J, Tyurin VA, Tyurina YY, Fadeel B, **Kagan VE**. NADPH oxidase-dependent oxidation and externalization of phosphatidylserine during apoptosis in DMSO-differentiated HL-60 cells: Role in phagocytic clearance. *J. Biol. Chem.* 2002, 277: 49965-49975.
153. Hubel CA, **Kagan VE**, Roberts JM. 8,12-iso-iPF2 α -VI: The last word on oxidative stress? *Am J. Obstet. Gynecol.* 2002; 187: 1119.
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.* 2002; 184: 1-8.
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.* 2002; 53: 968-977.
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.* 2003; 23: 51-61.
157. **Kagan VE**, Kuzmenko AI, Shvedova AA, Kisin ER, Li R, Martin I, Quinn PJ, Tyurin VA, Tyurina YY, Yalowich JC. 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.* 2003; 1620, 72-84.
158. **Kagan VE**, Borisenko GG, Serinkan BF, Tyurina YY, Tyurin VA, Jiang J, Liu SX, Shvedova AA, Fabisiak JP, Uthaisang W, Fadeel B. Appetizing rancidity of apoptotic cells for macrophages: oxidation/externalization/recognition of phosphatidylserine. *Amer. J. Physiol.: Lung. Cel. Mol. Physiol.* 2003; 285(1):L1-L17.
159. Gryzunov YA, Arroyo A, Vigne JL, Zhao Q, Tyurin VA, Hubel CA, Gandley RE, Vladmirov YA, Taylor RN, **Kagan VE**. Binding of fatty acids facilitates oxidation of cysteine-34 and converts copper-albumin complexes from antioxidants to prooxidants. *Arch. Biochem. Biophys.* 2003; 413(1):53-66.
160. Borisenko GG, Matsura T, Liu SX, Tyurin VA, Jiang J, Serinkan FB, **Kagan VE**. Macrophage recognition of externalized phosphatidylserine and phagocytosis of apoptotic Jurkat cells – existence of a threshold. *Arch. Biochem. Biophys.* 2003; 413(1):41-52.
161. Fadeel B, **Kagan VE**. Apoptosis and macrophage clearance of neutrophils: regulation by reactive oxygen species. *Redox Reports.* 2003; 8:143-150.
162. Greenberger JS, Epperly MW, Gretton J, Jefferson M, Nie S, Bernarding M, **Kagan V**, Guo HL. Radioprotective gene therapy. *Curr. Gene Ther.* 2003; 3(3):183-195.

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*. 2003; 129-135.
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.* 2003; 29, S42-46.
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.* 2003; 35, 814-825.
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.* 2003; 17, 243-251.
167. Epperly MW, Osipov AN, Martin I, 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 32Dcl3 hematopoietic cells and subclones overexpressing human manganese superoxide dismutase. *Int. J. Radiat. Oncol. Biol. Phys.* 2004; 58:851-861.
168. Tyurina YY, Serinkan BF, Tyurin VA, Kini V, Yalowich JC, Schroit AJ, Fadeel B, **Kagan VE**. Lipid antioxidant, etoposide, inhibits phosphatidylserine externalization and macrophage clearance of apoptotic cells by preventing phosphatidylserine oxidation. *J. Biol. Chem.* 2004; 279:6056-6064.
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.* 2004; 11(8): 943-5.
170. Matura T, Kai M, Jiang J, Babu H, Kini V, Kusumoto C, Yamada K, **Kagan VE**. Endogenously generated hydrogen peroxide is required for execution of melphalan-induced apoptosis as well as oxidation and externalization of phosphatidylserine. *Chem Res. Toxicol.* 2004; 17:685-696.
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)*. 2004; 69: 38-44.
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.* 2004; 6: 227-236.
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.* 2004; 6:209-225.
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.* 2004; 6:203-208.
175. **Kagan VE**, Quinn PJ. Toward oxidative lipidomics of cell signaling. *Antioxid. Redox Signal.* 2004; 6:199-202.
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.* 2004; 279(22):23453-62.

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.* 2004; 90(5):1036-49.
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.* 2004; 1012:13-21.
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.* 2004; 126(30): 9221-32.
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.* 2004; 37(12):1963-1985.
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.* 2004; 324(3):1059-64.
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.* 2004; 39(11):1133-42.
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.* 2005; 45: 21-27.
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.* 2005; 25(6):673-84.
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.* 2005;291:457-64.
186. Fabisiak JP, Tyurina YY, Tyurin VA, **Kagan VE**. Quantification of selective phosphatidylserine oxidation during apoptosis. *Methods Mol. Biol.* 2005; 291:449-56.
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.* 2005; 12(8):1141-1144.
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 Mol. Cell Physiol.* 2005; 289(5):L698-708.
189. Tyurina YY, Nylander KD, Mirnics ZK, Portugal C, Yan C, Zaccaro C, Saragovi HU, **Kagan VE**, Schor NF. The intracellular domain of p75NTR as a determinant of cellular reducing potential and response to oxidant stress. *Aging Cell.* 2005; 4(4):187-196.

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, Svistunencko DA, Kurnikov IV, Borisenko GG. Cytochrome c acts as a cardiolipin oxygenase required for release of pro-apoptotic factors. *Nat. Chem Biol.* 2005; 1:223-232.
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.* 2005; 21(1):93-100.
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.* 2005; 57(3):357-67.
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.* 2005; 127(36):12460-12461.
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.* 2005; 0(9):1371-81.
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.* 2005; 127(45):15815-1582.
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.* 2005; 2(3):236-242.
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.* 2005; 19(6): 997-1004.
198. Gong H, Singh SV, Singh SP, Mu Y, Lee YJ, Saini SPP, Toma D, Ren S, **Kagan VE**, Day BW, Zimniak P, and Xie W, Orphan nuclear receptor PXR sensitizes oxidative stress responses in transgenic mice and cancerous cells. *Molec. Endocrinol.* 2006; 20(2):279-90.
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.* 2006; 20(6):387-94.
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.* 2006; 1093(1):71-82.
201. Bayir H, Fadeel B, Palladino MJ, Witas E, Kurnikov IV, Tyurina YY, Tyurin VA, Amoscato AA, Jiang J, Kochanek PM, DeKosky ST, Greenberger JS, Shvedova AA, **Kagan VE**. Apoptotic interactions of cytochrome c: redox flirting with anionic phospholipids within and outside of mitochondria. *Biochim. Biophys. Acta – Bioenergetics.* 2006; 1757(5-6):648-59.
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.* 2006; 47(3):454-60.

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.* 2006; 165(1):88-100.
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.* 2006; 281(21):14554-62.
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.* 2006; 45(15):4998-5009.
206. 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.* 2007; 62(2):154-69.
207. **Kagan VE**, Jiang J, Bayir H, Stoyanovsky DA. Targeting nitroxides to mitochondria: location, 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.* 2007; 43(3):348:50.
208. 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.* 2007; 74(6):801-9.
209. 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.* 2007; 221(3):339-48.
210. 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.* 2007; 101(1):168-81.
211. 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.* 2007; 46(11):3423-34.
212. 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.* 2007; 69(1):176-186.
213. 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.* 2007; 74(6):801-9.
214. Macias CA, Chiao JW, Xiao J, Arora DS, Tyurina YY, Delude RL, Wipf P, **Kagan VE**, Fink MP. Treatment with a novel hemigramicidin-TEMPO conjugate prolongs survival in a rat model of lethal hemorrhagic shock. *Ann. Surg.* 2007; 245(2):305-14.

215. 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.* 2007; 282(11):8498-509.
216. 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.* 2007; 320(3):1050-60.
217. 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.* 2007; 14(4):872-5.
218. 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.* 2007; 35(9 Suppl):S461-7.
219. 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.* 2007; 69(1):176-186.
220. 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. *Nanotoxicol.* 2007; 1(2):73-84.
221. Tyurina YY, Tyurin VA, Epperly MW, Greenberger JS, **Kagan VE**. Oxidative lipidomics of gamma-irradiation-induced intestinal injury. *Free Radic. Biol. Med.* 2007; 44(3):299-314.
222. 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.* 2007; 38(5):579-90.
223. 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.* 2007; 70(24):2071-9.
224. 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.* 2007; 46(49):14232-44
225. 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.* 2008; 368(1):145-50.
226. Hoye AT, Davoren JE, Wipf P, Fink MP, **Kagan VE**. Targeting mitochondria. *Acc. Chem. Res.* 2008; 41(1):87-97. Huang Z, Jiang J, Tyurin VA, Zhao Q, Mnskin 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.* 2008; 44(11):1935-44.
227. 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.* 2008; 12(1):206. Jiang J, Belikova NA, Hoye AT, Zhao Q, Epperly NW, Greenberger JS, Wipf P, **Kagan VE**. A mitochondria-targeted nitroxide/hemigramicidin S conjugate protects mouse embryonic cells against gamma irradiation. *Int. J. Radiat. Oncol. Biol. Phys.* 2008; 70(3):816-25.

228. 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.* 2008; 582(5):725-8.
229. Tyurina YY, Tyurin VA, Epperly MW, Greenberger JS, **Kagan VE**. Oxidative lipidomics of gamma-Irradiation-induced intestinal injury. *Free Radic. Biol. Med.* 2008; 44(3):299-314.
230. 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.* 2008; 107(6):1614-33.
231. Borisenko GG, Kapralov AA, Tyurin VA, Maeda A, Stoyanovsky DA, **Kagan VE**. Molecular design of new inhibitors of peroxidase activity of cytochrome c/cardiophilin complexes: fluorescent oxadiazole-derivatized cardiophilin. *Biochemistry.* 2008; 47(51):13699-710.
232. 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.* 2008; 284(4):2383-2396.
233. 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.* 2008; 85(3):427-37.
234. 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.* 2008; 121(2):192-204.
235. 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.
236. **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/cardiophilin peroxidase complexes: A new strategy in anti-apoptotic drug discovery. *Mol. Nutr. Food Res.* 2009; 53(1):104-114.
237. 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.* 2009; 37(4):1536.
238. Konduru NV, Tyurina YY, Feng W, Basova LV, Belikova NA, Bayir H, Clark K, Rubin M, Stolz D, Vallhov H, Scheynius A, Witas 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.* 2009; 4(2):e4398.
239. 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.* 2009; 106(8):2653-8.

240. 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.* 2009; 257(3):161-71.
241. 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.* 2009; 284(23):15951-69.
242. **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/cardioplipin relations In mitochondria: a kiss of death. *Free Radic. Biol. Med.* 2009; 46(11):1439-53.
243. 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.* 2009; 69(6):2487-96.
244. 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).* 2009; 74(3): 301-7.
245. 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.* 2009; 583(12): 1945-50.
246. 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.* 2009; 297(3):C621-31.
247. 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 cardioplipin and phosphatidylserine in cells and tissues induced by pro-apoptotic and pro-inflammatory stimuli. *J. Chromatogr. B Analyt. Technol. Biomed. Life Sci.* 2009; 877(26):2863-72.
248. Witasp E, Shvedova AA, **Kagan VE**, Fadeel B. Single-walled carbon nanotubes impair human macrophage engulfment of apoptotic cell corpses. *Inhal. Toxicol.* 2009; (S1):131-136.
249. 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.* 2009; 172(6):706-17.
250. 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.* 2009; 131(47):17194-205.
251. 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.* 2009; 583(21):3437-42.

252. 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.* 2009; 580:153-83.
253. 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.* 2009; 284(44):30395-407.
254. **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.* 2009; 61(14):1375-85.
255. 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.* 2009; 131(32):11288-9.
256. 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.* 2009; 391(1):1127-30.
257. 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.* 2010; 113(4):965-77.
258. 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.* 2010; 25(7):2328-33. PMID: 20179007.
259. 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.* 2010; 267(1):106-18. PMID:20059647.
260. 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. *Ann. Rev. Pharmacol. Toxicol.* 2010; 20:63-88.
261. 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.
262. **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.* 2010; 5(5):354-9.
263. 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.* 2010; 299(1):L73-85. PMID: 20418384.
264. 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.* 2010; 32(5-6):385-95. PMID: 21124000.
265. 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.* 2011; 5(3):2098-108. PMID: 21344859.
266. 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.* 2011, 175(5):610-21. PMID: 21338246.
267. 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.* 2011, 252(1):1-10. PMID: 213310169.
268. Samhan-Arias AK, Tyurina YY, **Kagan VE**. Lipid antioxidants: free radical scavenging versus regulation of enzymatic lipid peroxidation. *J. Clin. Biochem. Nutr.* 2011; 48(1):91-5. PMID: 21297919.
269. 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.* 2011; 11(3):369-81. PMID: 21296189.
270. 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.* 2011; 300(4):L624-32. PMID: 21239534.
271. 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.* 2011; 300(4):L526-33. PMID: 21239532.
272. 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.
273. 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.* 2011; 5(7):5755-62. PMID: 21657201.
274. Stoyanovsky DA, Maeda A, Atkins JL, **Kagan VE**. Assessments of thiyl radicals in biosystems: difficulties and new applications. *Anal. Chem.* 2011; 83(17):6432-8. PMID: 21591751.
275. 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.* 2011; 1808(9):2147-55. PMID: 21550335.

276. 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.* 2011; 80(3):860-8. PMID: 21493014.
277. 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.* 2011; 413(1):149-153. PMID: 21872574.
278. 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.* 2011; 201(1):185-90. PMID: 21255575.
279. 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.* 2011; 412(1):55-60. PMID: 21806968.
280. 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.* 2011; 5(9):7342-53. PMID: 21800898.
281. 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.* 2011; 52(5):87-9. PMID: 22203369.
282. 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.* 2011; 25(6):841-8. PMID: 22021675.
283. 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.* 2011; 2:497. PMID: 21988913.
284. 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.* 2011; 2(11):814-817. PMID: 2224778.
285. 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; 288(1):111-121. PMID: 23150663.
286. Tyurin VA, Yanamala N, Tyurina YY, Klein-Seetharaman J, Macphee CH, **Kagan VE**. Specificity of lipoprotein-associated phospholipase A₂ toward oxidized phosphatidylserines: lipid chromatography-electrospray ionization mass spectrometry characterization of products and

computer modeling of interactions. *Biochemistry*. 2012; 51 (48):9736-9750. PMID: 23148485.

287. Hoye AT, Davoren JE, Wipf P, Fink MP, **Kagan VE**. Correction to targeting mitochondria. *Acc. Chem. Res.* 2012; 45(12):2222. PMID: 23145896.
288. 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; 9(9-10):1691-1695. PMID: 22996965.
289. 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.
290. 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.* 2012; (3):235-41. PMID: 22210054.
291. 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.* 2012; 15(10):1407-13. PMID: 22922784.
292. 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.* 2012; 165(5):545-62. PMID: 22692104.
293. 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.* 2012; 45(10):1770-81. PMID: 22824066.
294. Tkach AV, Yanamala N, Stanley S, Shurin MR, Shurin GV, Kisin ER, Murray AR, Pareso S, Khaliullin T, Kotchev 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*. 2012; 288(1):111-21. PMID: 22887961.
295. 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.* 2012; 67(2):461-76. PMID: 22669739.
296. 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.* 2012; 302(12):L1287-95. PMID: 22523284.
297. Shvedova AA, Pietroiusti A, Fadeel B, **Kagan VE**. Mechanisms of carbon nanotube-induced toxicity: focus on oxidative stress. *Toxicol. Appl. Pharmacol.* 2012; 261(2):121-33. PMID: 22513272.
298. 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, Kotchev 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*. 2012; 7(3):e30923. PMID: 22479306.

299. 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*. 2012; 1818(10):2413-33. PMID: 22464971.
300. 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*. 2012; 6(5):4147-56. PMID: 22463369.
301. 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*. 2012; 6(3):1925-38. PMID: 22303956.
302. 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*. 2013; 57(8):1410-22. PMID: 23650208.
303. 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*. 2013; 1(3):302-309. PMID: 23626907.
304. 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; 9(16):2721-9. PMID: 23447468.
305. 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*. 2013; 288(1):111-21. PMID: 23150663.
306. 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*. 2013; 75(15):2070-7. PMID: 23726945.
307. 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*. 2013; 49(5):759-67. PMID:23721177.
308. 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*. 2013; 10(11):920-37. PMID: 23496248.
309. 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.* 2014; 28(4):403-12. PMID:24497278.

310. Tyurin VA, Balasubramanian K, Winnica 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; 21(5):825-35. PMID: 24464221.
311. **Kagan VE**, Epand RM. Deciphering the mysteries of cardiolipins in mitochondria. *Chem. Phys. Lipids.* 2013; 179: 2-4. PMID: 24365282.
312. **Kagan VE**, Chu CT, Tyurina YY, Cheikhi A, Bayir H. Cardiolipin asymmetry, oxidation and signaling. *Chem. Phys. Lipids.* 2013; 179:64-9. PMID: 24300280.
313. 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.* 2013; 306(2):L170-82. PMID: 24213921.
314. 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.* 2013; 272(2):373-83. PMID: 23886933.
315. 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.* 2013; 15(10):1197-205. PMID: 24036476.
316. 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. *Biochem. J.* 2013; 456(3):441-52. PMID: 24099549.
317. 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.* 2014; 28(5):403-12. PMID: 24497278.
318. 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.* 2014; 21(5):825-35. PMID: 24464221.
319. 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.* 2014; 289(15):10668-79. PMID: 24591516.
320. 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**, Gabrilovich DI. Oxidized lipids block antigen cross-presentation by dendritic cells in cancer. *J. Immunol.* 2014; 192(6):2920-31. PMID: 24554775.

321. **Kagan VE**, Epanand RM. Deciphering the mysteries of cardiolipins in mitochondria. *Chem. Phys. Lipids.* 2014; 179:1-2. PMID: 24365282.
322. Chu CT, Bayir H, **Kagan VE**. LC3 binds externalized cardiolipin on injured mitochondria to signal mitophagy in neurons: Implications for Parkinson disease. *Autophag.* 2014; 10(2):376-378. PMID: 24351649.
323. 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.* 2014; 179:3-10. PMID: 24333544.
324. 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.* 2014; 7(2):476-87. PMID:24703837.
325. 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.* 2014; 71C:221-230. PMID: 24631490.
326. 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. Biol.* 2014; 1105:613-21. PMID: 24623356.
327. Fabisiak JP, Tyurina YY, Tyurin VA, **Kagan VE**. Quantification of selective phosphatidylserine oxidation during apoptosis. *Methods Mol. Biol.* 2014; 1105:603-11. PMID: 2462355.
328. 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.
329. 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.* 2014; 6(6):542-52. PMID: 24848241.
330. 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 Nano.* 2014; 8(6):5585-99. PMID: 24847914.
331. Amoscato AA, Sparvero LJ, He RR, Watkins S, Bayir H, **Kagan VE**. Imaging mass spectrometry of diversified cardiolipin molecular species in the brain. *Anal. Chem.* 2014; 86(13):6587-95. PMID: 24949523.
332. **Kagan VE**, Kapralov AA, St Croix CM, Watkins SC, Kisin ER, Kotchey GP, Balasubramanian K, Vlasova II, Yu J, Kim K, Seo W, Mallampalli RK, Star A, Shvedova AA. Lung macrophages “digest” carbon nanotubes using a superoxide/peroxynitrite oxidative pathway. *ACS Nano.* 2014;

8(6):5610-21. PMID: 24871084.

333. Yanamala N, Kapralov AA, Djukic M, Peterson J, Mao G, Klein-Seetharaman J, Stoyanovsky DA, Stursa J, Neuzil J, **Kagan VE**. Structural re-arrangement and peroxidase activation of cytochrome c by anionic analogues of vitamin E: tocopherol-succinate and tocopherol-phosphate. *J. Biol. Chem.* 2014; 289(47):32488-89. PMID: 25278024.
334. Kisin ER, Yanamala N, Farcas MT, Gutkin DW, Shurin MR, **Kagan VE**, Bugarski AD, Shvedova AA. Abnormalities in the male reproductive system after exposure to diesel and biodiesel blend. *Environ. Mol. Mutagen.* 2014; 56(20):265-76. PMID: 25327512.
335. Schlattner U, Tokarsaka-Schlattner M, Epanand RM, Boissan M, Lacombe ML, Klein-Seetharaman J, **Kagan VE**. Mitochondrial NM23-H4/NDPK-D: a bifunctional ranswitch for bioenergetics and lipid signaling. *Naunyn Schmiedebergs Arch. Pharmacol.* 2014; 388(2):271-8. PMID: 25231795.
336. Mohammadyani D, Tyurin VA, O'Brien M, Sadovsky Y, Gabrilovich DI, Klein-Seetharaman J, **Kagan VE**. Molecular speciation and dynamics of oxidized triacylglycerols in lipid droplets: Mass spectrometry and coarse-grained simulations. *Free Radic. Biol. Med.* 2014; 76:43-60. PMID: 25110833.
337. Fatfat M, Merhi RA, Rahal O, Stoyanovsky DA, Zaki A, Haidar H, **Kagan VE**, Gali-muhtasib H, Machaca K. Copper chelation selectively kills colon cancer cells through redox cycling and generation of reactive oxygen species. *BMC Cancer.* 2014; 14:527. PMID: 25047035.
338. Friedmann Angeli JP, Schneider M, Proneth B, Tyurina YY, Tyurin VA, Hammond VJ, Herbach N, Aichler M, Walch A, Eggenhofer E, Basavarajappa D, Rådmark O, Kobayashi S, Seibt T, Beck H, Neff F, Esposito I, Wanke R, Förster H, Yefremova O, Heinrichmeyer M, Bornkamm GW, Geissler EK, Thomas SB, Stockwell BR, O'Donnell VB, **Kagan VE**, Schick JA, Conrad M. . Inactivation of the ferroptosis regulator Gpx4 triggers acute renal failure in mice. *Nat. Cell Biol.* 2014; 16(12):1180-91.
339. Ji J, Baart S, Vikulina AS, Clark RS, Anthonymuthu TS, Tyurin VA, Du L, St Croix CM, Tyurina YY, Lewis J, Skoda EM, Kline AE, Kochanek PM, Wipf P, **Kagan VE**, Bayır H. Deciphering of mitochondrial cardiolipin oxidative signaling in cerebral ischemia-reperfusion. *J. Cereb. Blood Flow Metab.* 2015; 35(2):319-28.
340. Zhao Y, Burkert SC, Tang Y, Sorescu DC, Kapralov AA, Shurin GV, Shurin MR, **Kagan VE**, Star A. Nano-gold corking and enzymatic uncorking of carbon nanotube cups. *J. Am. Chem. Soc.* 2015; 137(2):675-84. PMID: 25530234.
341. Stoyanovsky DA, Jiang J, Murphy MP, Epperly M, Zhang X, Li S, Greenberger J, **Kagan V**, Bayır H. Design and synthesis of a mitochondria-targeted mimic of glutathione peroxidase, mitoebsele-2, as a radiation mitigator. *ACS Med. Chem. Lett.* 2014; 5(12):1304-1307. PMID: 25530831.
342. **Kagan VE**, Tyurina YY, Tyurin V, Mohammadyani D, Angeli JP, Baranov SV, Klein-Seetharaman J, Friedlander RM, Mallampalli RK, Conrad M, Bayır H. Cardiolipin signaling mechanisms: collapse of asymmetry and oxidation. *Antioxid. Redox Signal.* 2015; 22(18):1667-80. PMID: 25566681.
343. Rolyan H, Tyurina YY, Hernandez M, Amoscato AA, Sparvero LJ, Nmezi BC, Lu Y, Estécio MR, Lin K, Chen J, He RR, Gong P, Rigatti LH, Dupree J, Bayır H, **Kagan VE**, Casaccia P, Padiath QS. Defects of lipid synthesis are linked to the age-dependent demyelination caused by lamin B1 overexpression. *J. Neurosci.* 2015; 35(34):12002-17. PMID: 26311780.

344. Planas-Iglesias J, Dwarakanath H, Mohammadyani D, Yanamala N, **Kagan VE**, Klein-Seetharaman J. Cardiolipin interactions with proteins. *Biophys. J.* 2015; 109(6):1282-94. PMID: 26300339.
345. Bakan A, Kapralov AA, Bayir H, Hu F, **Kagan VE**, Bahar I. Inhibition of peroxidase activity of cytochrome c: De novo compound discovery and validation. *Mol. Pharmacol.* 2015; 88(3):421-7. PMID: 26078313.
346. Seo W, Kapralov AA, Shurin GV, Shurin MR, **Kagan VE**, Star A. Payload drug vs. nanocarrier biodegradation by myeloperoxidase- and peroxynitrite-mediated oxidations: pharmacokinetic implications. *Nanoscale.* 2015;7(19):8689-94. PMID: 25902750.
347. Tejero J, Kapralov AA, Baumgartner MP, Sparacin-Watkins CE, Anthonymutu TS, Vlasova II, Camachu CJ, Gladwin MT, Bayir, H, **Kagan VE**. Peroxidase activation of cytoglobin by anionic phospholipids: Mechanisms and consequences. *Biochim. Biophys. Acta.* 2016; 1861(5):391-401. PMID: 2698591.
348. Banerjee K, Munshi S, Xu H, Frank DE, Chen HL, Chu CT, Yang J, Cho S, **Kagan VE**, Denton TT, Tyurina YY, Jiang JF, Gibson GE. Mild mitochondrial metabolic deficits by α -ketoglutarate dehydrogenase inhibition cause prominent changes in intracellular autophagic signaling: Potential role in the pathobiology of Alzheimer's disease. *Neurochem. Int.* 2016; 96:32-45. PMID:26923918.
349. Huang Z, Epperly M, Watkins SC, Greenberger JS, **Kagan VE**, Bayir H. Necrostatin-1 rescues mice from lethal irradiation. *Biochim. Biophys. Acta.* 2016; 1862(4):850-6. PMID: 26802452.
350. Vlasova II, Kapralov AA, Michael ZP, Burkert SC, Shurin MR, Star A, Shvedova AA, **Kagan VE**. Enzymatic oxidative biodegradation of nanoparticles: Mechanisms, significance and applications. *Toxicol. Appl. Pharmacol.* 2016; 299:58-69. PMID: 26768553.
351. Mao G, Qu F, St Croix CM, Tyurina YY, Planas-Iglesias J, Jiang J, Huang Z, Amoscato AA, Tyurina VA, Kapralov AA, Cheikhi A, Maguire J, Klein-Seetharaman J, Bayir H, **Kagan VE**. Mitochondrial redox opto-lipidomics reveals mono-oxygenated cardiolipins as pro-apoptotic death signals. *ACS Chem. Biol.* 2016; 11(2):530-40. PMID: 26697918.
352. Zou C, Synan MJ, Li J, Xiong S, Manni ML, Liu Y, Chen BB, Zhao Y, Shiva S, Tyurina YY, Jiang J, Lee JS, Das S, Ray A, Ray P, **Kagan VE**, Mallampalli RK. LPS impairs oxygen utilization in epithelia by triggering degradation of the mitochondrial enzyme Alcat1. *J. Cell Sci.* 2016; 129(1):51-64. PMID:26604221.
353. Shvedova AA, Kisin ER, Yanamala N, Farcas MT, Menas AL, Williams A, Fournier PM, Reynolds JS, Gutkin DW, Star A, Reiner RS, Halappanavar S, **Kagan VE**. Gender differences in murine pulmonary responses elicited by cellulose nanocrystals. *Part Fibre Toxicol.* 2016; 13(1):28. PMID: 27278671.
354. Buland JR, Wasserloos KJ, Tyurin VA, Tyurina YY, Amoscato AA, Mallampalli RK, Chen BB, Zhao J, Zhao Y, Ofori-Acquah S, **Kagan VE**, Pitt BR. Biosynthesis of oxidized lipid mediators via lipoprotein associated phospholipase A2 hydrolysis of extracellular cardiolipin induces endothelial toxicity. *Am. J. Physiol.:Lung Cell Mol. Physiol.* 2016; 311(2):L303-16. PMID: 27233995.
355. Maguire JJ, Tyurina YY, Mohammadyani D, Kapralov AA, Anthonymuthu TS, Qu F, Amoscato AA, Sparvero LJ, Tyurin VA, Planas-Iglesias J, He RR, Klein-Seetharaman J, Bayir H, **Kagan VE**. Known unknowns of cardiolipin signaling: The best is yet to come. *Biochim. Biophys. Acta.* 2016; 1862(1):8-24. PMID: 27498292.
356. Fidan E, Lewis J, Kline AE, Garman RH, Alexander H, Cheng JP, Bondi CO, Clark R, Dezfulian C,

Kochanek PM, **Kagan VE**, Bayir H. Repetitive mild traumatic brain injury in the developing brain: effects on long-term functional outcome and neuropathology. *J. Neurotrauma*. 2016; 33(7):641-51. PMID: 26214116.

357. Sparvero LJ, Amoscato AA, Fink AB, Anthony-muthu T, New LE, Kochanek PM, Watkins S, **Kagan VE**, Bayir H. Imaging mass spectrometry reveals loss of polyunsaturated cardiolipins in the cortical contusion, hippocampus and thalamus after traumatic brain injury. *J. Neurochem*. 2016; 139(4):659-675. PMID:27591733
358. **Kagan VE**, Jiang J, Huang Z, Tyurina YY, Desbourdes C, Cottet-Rousselle C, Dar HH, Verma M, Tyurin VA, Kapralov AA, Cheikhi A, Mao G, Stolz D, St Croix CM, Watkins S, Shen Z, Li Y, Greenberg ML, Tokarska-Schlattner M, Boissan M, Lacombe ML, Epanand RM, Chu CT, Mallampalli RK, Bayir H, Schlattner U. NDPK-D (NM23-H4)-mediated externalization of cardiolipin enables elimination of depolarized mitochondria by mitophagy. *Cell Death Differ*. 2016; 23(7): 1140-51. PMID: 26742431.
359. Ouyang Y, Bayer A, Chu T, Tyurin VA, **Kagan VE**, Morelli AE, Coyne CB, Sadovsky Y. Isolation of human trophoblastic extracellular vesicles and characterization of their cargo and antiviral activity. *Placenta*. 2016; 47:86-95. PMID: 27780544.
360. Olonisakin TF, Li H, Xiong Z, Kochman EJ, Yu M, Qu Y, Hulver M, Kolls JK, St Croix C, Doi Y, Nguyen MH, Shanks RM, Mallampalli RK, **Kagan VE**, Ray A, Siverstein RL, Ray P, Lee JS. CD36 provides host protection against *Klebsiella pneumoniae* intrapulmonary infection by enhancing lipopolysaccharide responsiveness and macrophage phagocytosis. *J. Infect. Dis*. 2016; 214(12):1865-1875. PMID: 27683817.
361. Mahapatra G, Varughese A, Ji Q, Lee I, Liu J, Vaishnav A, Sinkler C, Kapralov AA, Moraes CT, Sanderson TH, Stemmier TL, Grossman LI, **Kagan VE**, Brunzelle JS, Salomon AR, Edwards BF, Hüttemann M. Phosphorylation of cytochrome c threonine 28 regulates electron transport chain activity in kidney: implication for AMP kinase. *J. Biol. Chem*. 2017; 292(1):64-89. PMID: 27758862.
362. Tian H, Sparvero LJ, Amoscato AA, Bloom A, Bayir H, **Kagan VE**, Winograd N. Gas cluster ion beam time-of-flight secondary ion mass spectrometry high-resolution imaging of cardiolipin speciation in the brain: Identification of molecular losses after traumatic injury. *Anal. Chem*. 2017; 89(8):4611-4619. PMID: 28306235.
363. Chiu CF, Saidi WA, **Kagan VE**, Star A. Defect-induced near-infrared photoluminescence of single-walled carbon nanotubes treated with polyunsaturated fatty acids. *J. Am. Chem. Soc*. 2017; 139(13):4859-4865. PMID: 28288512.
364. **Kagan VE**, Bayir H, Tyurina YY, Bolevich SB, Maguire JJ, Fadeel B, Balasubramanian K. Elimination of the unnecessary: Intra- and extracellular signaling by anionic phospholipids. *Biochem. Biophys. Res. Commun*. 2017;(3):482-490. Review. PMID: 28212735.
365. Chakraborty K, Raundhal M, Chen BB, Morse C, Tyurina YY, Khare A, Oriss TB, Huff R, Lee JS, St Croix CM, Watkins S, Mallampalli RK, **Kagan VE**, Ray A, Ray P. The mito-DAMP cardiolipin blocks IL-10 production causing persistent inflammation during bacterial pneumonia. *Nat. Commun*. 2017; 8:3944. doi: 10.1038/ncomms 13944. PMID: 28074841.
366. Kooijman EE, Swim LA, Graber ZT, Tyurina YY, Bayir H, **Kagan VE**. Magic angle spinning ³¹P NMR Spectroscopy reveals two essentially identical ionization states for the cardiolipin phosphates in phospholipid liposomes. *Biochim. Biophys. Acta*. 2017; 1859(1):61-68. PMID: 27984017.

367. Tyurina, YY, Lou W, Qu F, Tyurin VA, Mohammadyani D, Liu J, Hüttemann M, Frasso MA, Wipf P, Bayir H, Greenberg ML, **Kagan VE**. Lipidomics characterization of biosynthetic and remodeling pathways of cardiolipins in genetically and nutritionally manipulated yeast cells. *ACS Chem. Biol.* 2017; 12(1):265-281. PMID: 27982579.
368. Anthonymuthu TS, Kenny EM, Amoscato AA, Lewis J, Kochanek PM, **Kagan VE**, Bayir H. Global assessment of oxidized free fatty acids in brain reveals an enzymatic predominance to oxidative signaling after trauma. *Biochim. Biophys. Acta.* 2017; 1863(10 Pt B):2601-2613. PMID:28347845.
369. Doll S, Proneth B, Tyurina YY, Panzilius E, Kohayashi S, Ingold I, Irmeler M, Beckers J, Aichler M, Walch A, Prokisch H, Trümbach D, Mao G, Qu F, Bayir H, Füllekrug J, Scheel CH, Wurst W, Schick JA, **Kagan VE**, Angeli JP, Conrad M. ACSL4 dictates ferroptosis sensitivity by shaping cellular lipid composition. *Nat. Chem. Biol.* 2017; 13(1):91-98. PMID: 27842070.
370. **Kagan VE**, Mao G, Qu F, Angeli JP, Doll S, Croix CS, Dar HH, Liu B, Tyurin VA, Ritov VB, Kapralov AA, Amoscato AA, Jiang J, Anthonymuthu T, Mohammadyani D, Yang Q, Proneth B, Klein-Seetharaman J, Watkins S, Bahar I, Greenberger, J, Mallampalli RK, Stockwell BR, Tyurina YY, Conrad M, Bayir H. Oxidized arachidonic and adrenic PEs navigate cells to ferroptosis. *Nat. Chem. Biol.* 2017; 13(1):81-90. PMID: 27842066.
371. Brand RM, Epperly NW, Stottlemeyer JM, Skoda EM, Gao X, Li S, Huq S, Wipf P, **Kagan VE**, Greenberger JS, Falo LD Jr. A topical mitochondria-targeted redox-cycling nitroxide mitigates oxidative stress-induced skin damage. *J. Invest. Dermatol.* 2017; 137(3):576-586. PMID: 27794421.
372. Dobrovolskaia MA, Shurin MR, **Kagan VE**, Shvedova AA. Ins and outs in environmental and occupational safety studies of asthma and engineered nanomaterials. *ACS Nano.* 2017; 9(18):5948-5956. PMID: 28737932.
373. Veglia F, Tyurin VA, Mohammadyani D, Blasi M, Duperret EK, Donthireddy L, Hashimoto A, Kapralov A, Amoscato A, Angelini R, Patel S, Alicea-Torres K, Weiner D, Murphy ME, Klein-Seetharaman J, Celis E, **Kagan VE**, Gabrilovich DI. Lipid bodies containing oxidatively truncated lipids block antigen cross-presentation by dendritic cells in cancer. *Nat Commun.* 2017; 8(1):2122. PMID:29242535, PMC5730553
374. Khaliullin TO, Kisin ER, Murray AR, Yanamala N, Shurin MR, Gutkin DW, Fatkhutdinova LM, **Kagan VE**, Shvedova AA. Mediation of the single-walled carbon nanotubes induced pulmonary fibrogenic response by osteopontin and TGF- β 1. *Exp Lung Res.* 2017; 43(8):311-326. PMID: 29140132.
375. Wenzel SE, Tyurina YY, Zhao J, St Croix CM, Dar HH, Mao G, Tyurin VA, Anthonymuthu TS, Kapralov AA, Amoscato AA, Mikulska-Ruminska K, Shrivastava IH, Kenny EM, Yang Q, Rosenbaum JC, Sparvero LJ, Emler DR, Wen X, Minami Y, Qu F, Watkins SC, Holman TR, VanDemark AP, Kellum JA, Bahar I, Bayir H, **Kagan VE**. PEBP1 wards ferroptosis by enabling lipoxygenase generation of lipid death signals. *Cell.* 2017; 171(3):628-641. PMID: 29053969.
376. Schlattner U, Tokarska-Schlattner M, Epand RM, Boissan M, Lacombe ML, **Kagan VE**. NME4/nucleoside diphosphate kinase D in cardiolipin signaling and mitophagy. *Lab. Invest.* 2018; 98(2):228-232. PMID: 29035377.
377. Geric I, Tyurina YY, Krysko O, Krysko DV, De Schryver E, **Kagan VE**, Van Veldhoven PP, Baes M, Verheijden S. Lipid homeostasis and inflammatory activation are disturbed in classically activated macrophages with peroxisomal β -oxidation deficiency. *Immunology.* 2018; 153(3):342-

356. PMID: 28940384

378. Chiu CF, Dar HH, Kapralov AA, Robinson RAS, **Kagan VE**, Star A. Nanoemitters and innate immunity: the role of surfactants and bio-coronas in myeloperoxidase-catalyzed oxidation of pristine single-walled carbon nanotubes. *Nanoscale*. 2017; 9(18):5948-5956. PMID:28440832.
379. Anthony-muthu TS, Kenny EM, Amoscato AA, Lewis J, Kochanek PM, **Kagan VE**, Bayır H. Global assessment of oxidized free fatty acids in brain reveals an enzymatic predominance to oxidative signaling after trauma. *Biochim. Biophys. Acta*. 2017; 1863(10 Pt B):2601-2613. PMID:28347845.
380. Conrad M, **Kagan VE**, Bayır H, Pagnussat GC, Head B, Traber MG, Stockwell BR. Regulation of lipid peroxidation and ferroptosis in diverse species. *Genes Dev*. 2018; 32(9-10):602-619. PMID: 29802123.
381. Krysko O, Aaes TL, **Kagan VE**, D'Herde K, Bachert C, Leybaert L, Vandenabeele P, Krysko DV. Necroptotic cell death in anti-cancer therapy. *Immunol. Rev*. 2017; 280(1):207-219. PMID: 29027225.
382. Stockwell BR, Friedmann Angeli JP, Bayır H, Bush AI, Conrad M, Dixon SJ, Fulda S, Gascón S, Hatzios SK, **Kagan VE**, Noel K, Jiang X, Linkermann A, Murphy ME, Overholtzer M, Oyagi A, Pagnussat GC, Park J, Ran Q, Rosenfeld CS, Salnikow K, Tang D, Torti FM, Torti SV, Toyokuni S, Woerpel KA, Zhang DD. Ferroptosis: A regulated cell death nexus linking metabolism, redox biology, and disease. *Cell*. 2017; 171(2):273-285. PMID: 28985560.
383. Tyurina YY, Shrivastava I, Tyurin VA, Mao G, Dar HH, Watkins S, Epperly M, Bahar I, Shvedova AA, Pitt B, Wenzel SE, Mallampalli RK, Sadovsky Y, Gabrilovich D, Greenberger JS, Bayır H, **Kagan VE**. "Only a life lived for others is worth living": Redox signaling by oxygenated phospholipids in cell fate decisions. *Antioxid Redox Signal*. 2017; doi: 10.1089/ars.2017.7124. [Epub ahead of print] PMID: 28835115.
384. Gaschler MM, Andia AA, Liu H, Csuka JM, Hurlocker B, Vaiana CA, Heindel DW, Zuckerman DS, Bos PH, Reznik E, Ye LF, Tyurina YY, Lin AJ, Shchepinov MS, Chan AY, Peguero-Pereira E, Fomich MA, Daniels JD, Bekish AV, Shmanai VV, **Kagan VE**, Mahal LK, Woerpel KA, Stockwell BR. FINO₂ initiates ferroptosis through GPX4 inactivation and iron oxidation. *Nat. Chem. Biol*. 2018; 14(5):507-515. PMID:29610484.
385. Mohammadyani D, Yanamala N, Samhan-Arias AK, Kapralov AA, Stepanov G, Nuar N, Planas-Iglesias J, Sanghera N, **Kagan VE**, Klein-Seetharaman J. Structural characterization of cardiolipin-driven activation of cytochrome c into a peroxidase and membrane perturbation. *Biochim. Biophys. Acta*. 2018; 1860(5):1057-1068. PMID: 29317202.
386. Lou W, Ting HC, Reynolds CA, Tyurina YY, Tyurin VA, Li Y, Ji J, Yu W, Liang Z, Stoyanovsky DA, Anthony-muthu TS, Frasso MA, Wipf P, Greenberger JS, Bayır H, **Kagan VE**, Greenberg ML. Genetic re-engineering of polyunsaturated phospholipid profile of *Saccharomyces cerevisiae* identifies a novel role for Cld1 in mitigating the effects of cardiolipin peroxidation. *Biochim Biophys Acta Mol Cell Biol Lipids*. 2018 Oct;1863(10):1354-1368. doi: 10.1016/j.bbalip.2018.06.016. Epub 2018 Jun 20. PMID:29935382
387. Hassannia B, Wiernicki B, Ingold I, Qu F, Van Herck S, Tyurina YY, Bayır H, Abhari BA, Angeli JPF, Choi SM, Meul E, Heyninck K, Declercq K, Chirumamilla CS, Lahtela-Kakkonen M, Van Camp G, Krysko DV, Ekert PG, Fulda S, De Geest BG, Conrad M, **Kagan VE**, Vanden Berghe W, Vandenabeele P, Vanden Berghe T. Nano-targeted induction of dual ferroptotic mechanisms

eradicates high-risk neuroblastoma. *J Clin Invest*. 2018 Aug 1;128(8):3341-3355. doi: 10.1172/JCI99032. Epub 2018 Jun 25. PMID: 29939160

388. Anthonymuthu TS, Kenny EM, Lamade AM, **Kagan VE**, Bayir H. Oxidized phospholipid signaling in traumatic brain injury. *Free Radic Biol Med*. 2018 Aug 20;124:493-503. doi: 10.1016/j.freeradbiomed.2018.06.031. Epub 2018 Jun 30. Review. PMID:29964171
389. Lamade AM, Kenny EM, Anthonymuthu TS, Soysal E, Clark RSB, **Kagan VE**, Bayir H. Aiming for the target: Mitochondrial drug delivery in traumatic brain injury. *Neuropharmacology*. 2019 Feb;145(Pt B):209-219. doi: 10.1016/j.neuropharm.2018.07.014. Epub 2018 Jul 30. Review. PMID:30009835
390. Cole LK, Kim JH, Amoscato AA, Tyurina YY, Bay R H, Karimi B, Siddiqui TJ, **Kagan VE**, Hatch GM, Kauppinen TM. Aberrant cardiolipin metabolism is associated with cognitive deficiency and hippocampal alteration in tafazzin knockdown mice. *Biochim Biophys Acta Mol Basis Dis*. 2018 Oct;1864(10):3353-3367. doi: 10.1016/j.bbadis.2018.07.022. Epub 2018 Jul 25. PMID: 30055293
391. Dar HH, Tyurina YY, Mikulska-Ruminska K, Shrivastava I, Ting HC, Tyurin VA, Krieger J, St Croix CM, Watkins S, Bayir E, Mao G, Armbruster CR, Kapralov A, Wang H, Parsek MR, Anthonymuthu TS, Ogunsola AF, Flitter BA, Freedman CJ, Gaston JR, Holman TR, Pilewski JM, Greenberger JS, Mallampalli RK, Doi Y, Lee JS, Bahar I, Bomberger JM, Bayir H, **Kagan VE**. *Pseudomonas aeruginosa* utilizes host polyunsaturated phosphatidylethanolamines to trigger theft-ferroptosis in bronchial epithelium. *J Clin Invest*. 2018 Oct 1;128(10):4639-4653. doi: 10.1172/JCI99490. Epub 2018 Sep 10. PMID:30198910
392. Stoyanovsky DA, Tyurina YY, Shrivastava I, Bahar I, Tyurin VA, Protchenko O, Jadhav S, Bolevich SB, Kozlov AV, Vladimirov YA, Shvedova AA, Philpott CC, Bayir H, **Kagan VE**. Iron catalysis of lipid peroxidation in ferroptosis: Regulated enzymatic or random free radical reaction? *Free Radic Biol Med*. 2019 Mar;133:153-161. doi: 10.1016/j.freeradbiomed.2018.09.008. Epub 2018 Sep 12. Review. PMID:30217775
393. Burkert SC, Shurin GV, White DL, He X, Kapralov AA, **Kagan VE**, Shurin MR, Star A. Targeting myeloid regulators by paclitaxel-loaded enzymatically degradable nanocups. *Nanoscale*. 2018 Sep 27;10(37):17990-18000. doi: 10.1039/c8nr04437f. PMID:30226240
394. Kochanek PM, Jackson TC, Jha RM, Clark RSB, Okonkwo DO, Bayir H, Poloyac SM, Wagner AK, Empey PE, Conley YP, Bell MJ, Kline AE, Bondi CO, Simon DW, Carlson SW, Puccio AM, Horvat CM, Au AK, Elmer J, Treble-Barna A, Ikonovic MD, Shutter LA, Taylor DL, Stern AM, Graham SH, **Kagan VE**, Jackson EK, Wisniewski SR, Dixon CE. Paths to Successful Translation of New Therapies for Severe Traumatic Brain Injury in the Golden Age of Traumatic Brain Injury Research: A Pittsburgh Vision. *J Neurotrauma*. 2019 Feb 1. doi: 10.1089/neu.2018.6203. [Epub ahead of print] PMID: 30520681
395. Kenny EM, Fidan E, Yang Q, Anthonymuthu TS, New LA, Meyer EA, Wang H, Kochanek PM, Dixon CE, **Kagan VE**, Bayir H. Ferroptosis Contributes to Neuronal Death and Functional Outcome After Traumatic Brain Injury. *Crit Care Med*. 2019 Mar;47(3):410-418. doi: 10.1097/CCM.0000000000003555. PMID:30531185
396. Baranov SV, Baranova OV, Yablonska S, Suofu Y, Vazquez AL, Kozai TDY, Cui XT, Ferrando LM, Larkin TM, Tyurina YY, **Kagan VE**, Carlisle DL, Kristal BS, Friedlander RM. Mitochondria modulate programmed neuritic retraction. *Proc Natl Acad Sci U S A*. 2019 Jan 8;116(2):650-659. doi: 10.1073/pnas.1811021116. Epub 2018 Dec 24. PMID:30584104

397. Chao H, Lin C, Zuo Q, Liu Y, Xiao M, Xu X, Li Z, Bao Z, Chen H, You Y, Kochanek PM, Yin H, Liu N, **Kagan VE**, Bayır H, Ji J. Cardioliipin-dependent mitophagy guides outcome after traumatic brain injury. *J Neurosci*. 2019 Jan 9. pii: 3415-17. doi: 10.1523/JNEUROSCI.3415-17.2018. [Epub ahead of print] PMID:30626699
398. Tian H, Sparvero LJ, Blenkinsopp P, Amoscato AA, Watkins SC, Bayır H, **Kagan VE**, Winograd N. Secondary-Ion Mass Spectrometry Images Cardioliipins and Phosphatidylethanolamines at the Subcellular Level. *Angew Chem Int Ed Engl*. 2019 Mar 4;58(10):3156-3161. doi: 10.1002/anie.201814256. Epub 2019 Feb 14. PMID:30680861
399. Mikulska-Ruminska K, Shrivastava I, Krieger J, Zhang S, Li H, Bayır H, Wenzel SE, VanDemark AP, **Kagan VE**, Bahar I. Characterization of Differential Dynamics, Specificity, and Allostery of Lipoxygenase Family Members. *J Chem Inf Model*. 2019 Feb 28. doi: 10.1021/acs.jcim.9b00006. [Epub ahead of print] PMID: 30762363
400. Kim-Campbell N, Gretchen C, Ritov VB, Kochanek PM, Balasubramani GK, Kenny E, Sharma M, Viegas M, Callaway C, **Kagan VE**, Bayır H. Bioactive Oxyliipins in Infants and Children With Congenital Heart Disease Undergoing Pediatric Cardiopulmonary Bypass. *Pediatr Crit Care Med*. 2019 Jul 11. doi: 10.1097/PCC.0000000000002036. PMID:31305328
401. Veglia F, Tyurin VA, Blasi M, De Leo A, Kossenkov AV, Donthireddy L, To TKJ, Schug Z, Basu S, Wang F, Ricciotti E, DiRusso C, Murphy ME, Vonderheide RH, Lieberman PM, Mulligan C, Nam B, Hockstein N, Masters G, Guarino M, Lin C, Nefedova Y, Black P, **Kagan VE**, Gabrilovich DI. Fatty acid transport protein 2 reprograms neutrophils in cancer. *Nature*. 2019 May;569(7754):73-78. doi: 10.1038/s41586-019-1118-2. Epub 2019 Apr 17, PMID:30996346
402. Anthonymuthu TS, Kenny EM, Hier ZE, Clark RSB, Kochanek PM, **Kagan VE**, Bayır H. Detection of brain specific cardioliipins in plasma after experimental pediatric head injury. *Exp Neurol*. 2019 Jun;316:63-73. doi: 10.1016/j.expneurol.2019.04.007. Epub 2019 Apr 11. PMID: 30981805
403. Li M, Mandal A, Tyurin VA, DeLucia M, Ahn J, **Kagan VE**, van der Wel PCA. Surface-Binding to Cardioliipin Nanodomains Triggers Cytochrome c Pro-apoptotic Peroxidase Activity via Localized Dynamics. *Structure*. 2019 May 7;27(5):806-815.e4. doi: 10.1016/j.str.2019.02.007. Epub 2019 Mar 14, PMID:30879887
404. Anthonymuthu TS, Kenny EM, Lamade AM, Gidwani H, Krehel NM, Misse A, Gao X, Amoscato AA, Straub AC, **Kagan VE**, Dezfulian C, Bayır H. Lipidomics Detection of Brain Cardioliipins in Plasma Is Associated With Outcome After Cardiac Arrest. *Crit Care Med*. 2019 Apr;47(4):e292-e300. doi: 10.1097/CCM.0000000000003636. PMID:30855329
405. Li W, Feng G, Gauthier JM, Lokshina I, Higashikubo R, Evans S, Liu X, Hassan A, Tanaka S, Cicka M, Hsiao HM, Ruiz-Perez D, Bredemeyer A, Gross RW, Mann DL, Tyurina YY, Gelman AE, **Kagan VE**, Linkermann A, Lavine KJ, Kreisel D. Ferroptotic cell death and TLR4/Trif signaling initiate neutrophil recruitment after heart transplantation. *J Clin Invest*. 2019 Feb 26;130:2293-2304. doi: 10.1172/JCI126428. PMID: 30830879
406. Anthonymuthu TS, Kenny EM, Shrivastava I, Tyurina YY, Hier ZE, Ting HC, Dar HH, Tyurin VA, Nesterova A, Amoscato AA, Mikulska-Ruminska K, Rosenbaum JC, Mao G, Zhao J, Conrad M, Kellum JA, Wenzel SE, VanDemark AP, Bahar I, **Kagan VE**, Bayır H. Empowerment of 15-Lipoxygenase Catalytic Competence in Selective Oxidation of Membrane ETE-PE to Ferroptotic Death Signals, HpETE-PE. *J Am Chem Soc*. 2018 Dec 26;140(51):17835-17839. doi: 10.1021/jacs.8b09913. PMID: 30525572

407. Artyukhova MA, Tyurina YY, Chu CT, Zharikova TM, Bayir H, **Kagan VE**, Timashev PS. Interrogating Parkinson's disease associated redox targets: Potential application of CRISPR editing. *Free Radic Biol Med.* 2019 Jun 12. pii: S0891-5849(19)30251-5. doi: 10.1016/j.freeradbiomed.2019.06.007. [Epub ahead of print] Review. PMID: 31201850
408. Tyurina YY, St Croix CM, Watkins SC, Watson AM, Epperly MW, Anthonymuthu TS, Kisin ER, Vlasova II, Krysko O, Krysko DV, Kapralov AA, Dar HH, Tyurin VA, Amoscato AA, Popova EN, Bolevich SB, Timashev PS, Kellum JA, Wenzel SE, Mallampalli RK, Greenberger JS, Bayir H, Shvedova AA, **Kagan VE**. Redox (phospho)lipidomics of signaling in inflammation and programmed cell death. *J Leukoc Biol.* 2019 May 9. doi: 10.1002/JLB.3MIR0119-004RR. [Epub ahead of print] Review. PMID:31071242
409. Tyurina YY, Tyurin VA, Anthonymuthu T, Amoscato AA, Sparvero LJ, Nesterova AM, Baynard ML, Sun W, He R, Khaitovich P, Vladimirov YA, Gabrilovich DI, Bayir H, **Kagan VE**. "Redox lipidomics technology: Looking for a needle in a haystack". *Chem. Phys. Lipids.* 2019 Mar 27;221:93-107. doi: 10.1016/j.chemphyslip.2019.03.012. [Epub ahead of print], PMID:30928338
410. Kapralov AA, Yang Q, Dar HH, Tyurina YY, Anthonymuthu TS, Kim R, St Croix CM, Mikulska-Ruminska K, Liu B, Shrivastava IH, Tyurin VA, Ting HC, Wu YL, Gao Y, Shurin GV, Artyukhova MA, Ponomareva LA, Timashev PS, Domingues RM, Stoyanovsky DA, Greenberger JS, Mallampalli RK, Bahar I, Gabrilovich DI, Bayir H, **Kagan VE**. Redox lipid reprogramming commands susceptibility of macrophages and microglia to ferroptotic death. *Nat Chem Biol.* 2020 Mar;16(3):278-290. doi: 10.1038/s41589-019-0462-8. Epub 2020 Feb 17. PMID: 32080625
411. Hussey GS, Pineda Molina C, Cramer MC, Tyurina YY, Tyurin VA, Lee YC, El-Mossier SO, Murdock MH, Timashev PS, **Kagan VE**, Badylak SF. Lipidomics and RNA sequencing reveal a novel subpopulation of nanovesicle within extracellular matrix biomaterials. *Sci Adv.* 2020 Mar 20;6(12):eaay4361. doi: 10.1126/sciadv.aay4361. eCollection 2020 Mar. PMID: 32219161, PMCID: PMC7083606
412. Lamade AM, Anthonymuthu TS, Hier ZE, Gao Y, **Kagan VE**, Bayir H. Mitochondrial damage & lipid signaling in traumatic brain injury. *Exp Neurol.* 2020 Apr 11;329:113307. doi: 10.1016/j.expneurol.2020.113307. [Epub ahead of print] Review. PMID:32289317
413. Kisin ER, Yanamala N, Rodin D, Menas A, Farcas M, Russo M, Guppi S, Khaliullin TO, Iavicoli I, Harper M, Star A, **Kagan VE**, Shvedova AA. Enhanced morphological transformation of human lung epithelial cells by continuous exposure to cellulose nanocrystals. *Chemosphere.* 2020; 250:126170. doi: 10.1016/j.chemosphere.2020.126170. PMID:32114335
414. Kalpage HA, Vaishnav A, Liu J, Varughese A, Wan J, Turner AA, Ji Q, Zurek MP, Kapralov AA, **Kagan VE**, Brunzelle JS, Recanati MA, Grossman LI, Sanderson TH, Lee I, Salomon AR, Edwards BFP, Hüttemann M. Serine-47 phosphorylation of cytochrome *c* in the mammalian brain regulates cytochrome *c* oxidase and caspase-3 activity. *FASEB J.* 2019 Dec;33(12):13503-13514. doi: 10.1096/fj.201901120R. Epub 2019 Sep 28. PMID:31570002
415. Kim-Campbell N, Gretchen C, Ritov VB, Kochanek PM, Balasubramani GK, Kenny E, Sharma M, Viegas M, Callaway C, **Kagan VE**, Bayir H. Bioactive Oxylipins in Infants and Children With Congenital Heart Disease Undergoing Pediatric Cardiopulmonary Bypass. *Pediatr Crit Care Med.* 2020 Jan;21(1):33-41. doi: 10.1097/PCC.0000000000002036. PMID:31305328
416. **Kagan VE**, Tyurina YY, Sun WY, Vlasova II, Dar H, Tyurin VA, Amoscato AA, Mallampalli R, van der Wel PCA, He RR, Shvedova AA, Gabrilovich DI, Bayir H. Redox phospholipidomics of enzymatically generated oxygenated phospholipids as specific signals of programmed cell death.

417. Bayır H, Anthonymuthu TS, Tyurina YY, Patel SJ, Amoscato AA, Lamade AM, Yang Q, Vladimirov GK, Philpott CC, **Kagan VE**. Achieving Life through Death: Redox Biology of Lipid Peroxidation in Ferroptosis. *Cell Chem Biol.* 2020;27(4):387-408. doi: 10.1016/j.chembiol.2020.03.014. Review. PMID: 32275865

INVITED CHAPTERS IN BOOKS:

1. Arkhipenko YV, **Kagan VE**, Meerson FZ : 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, pp. 258-264, 1983.
2. **Kagan VE**, Savov VM, Serbinova EA, Osipov AN, Skrypin VI, Evstigneeva RP, Stoytchev TS.: 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, pp. 425-441, 1987.
3. **Kagan VE**, Serbinova EA, Bakalova RA, Novikov KN, Skrypin VI, Evstigneeva RP, Stoytchev TS.: 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, pp. 425-441, 1987.
4. **Kagan VE**, Bakalova RA, Serbinova EA, Koynova GM, Baldenkov GN, Tkachuk VA Stoytchev TS.: 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., Richelieu Press, London, pp. 417-438, 1988.
5. Goltsev V, Popov O, Doltchinkova V, Yordanov I, **Kagan VE**.: 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, pp. 249-253, 1988.
6. Serbinova EA, Kadiiska MB, Stoytchev TS, Lankin VZ, **Kagan VE**.: 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, pp. 866-869, 1989.
7. **Kagan VE**, Bakalova RA, Serbinova EA Stoytchev TS.: 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, pp. 301-308, 1989.
8. Serbinova EA, Koynova GM, Stoytchev TS, **Kagan VE**.: 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, pp. 579-582, 1989.
9. **Kagan VE**, Serbinova EA, Bakalova RA, Tyurin VA, Stoytchev TS, Erin AN, Prilipko LL.: 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, pp. 261-266, 1989.

10. **Kagan VE**, Spirichev VB, Erin AN.: Vitamin E, Physical Exercise and Sport. In: Nutrition, Physical Exercise and Sport., J. Hickson and I. Wolinsky, Eds., CRC Press, Boca Raton, Florida, pp.256-278, 1989.
11. **Kagan VE**, Packer L. Serbinova EA, Bakalova RA, Stoyanovsky DA, Zhelev ZhZh, Harfouf M, Kitanova SA, Rangelova DA.: 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, pp.889-908, 1990.
12. **Kagan VE**, Bakalova RA, Karakashev PH. 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, pp. 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 VE**, Serbinova EA, Maguire JJ, Shvedova AA, 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, pp. 121-125, 1992.
15. Serbinova EA, **Kagan VE**, 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, pp. 77-81, 1992.
16. **Kagan VE**, Packer L, Serbinova EA.: 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, pp. 21-28, 1992.
17. Packer L, **Kagan VE**.: 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., pp. 179-192, 1993.
18. **Kagan VE**, Bakalova RA, Ribarov SR, Zhelev ZZ, Serbinova EA, 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., pp.171-178, 1993.
19. Serbinova EA, 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., pp. 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., pp. 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, pp. 223-30, 1992.
22. **Kagan VE**, Packer L.: Antioxidative function of vitamin E and ubiquinols. In: Methods in Toxicology, L. Lash and D. Jones, eds, Academic Press, vol. 2, pp. 277-285, 1993.
23. **Kagan VE**, Spirichev VB, Serbinova EA, Witt E, Erin AN, 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, pp.185-213, 1994.

24. Engelman DT, Watanabe M, Engelman RM, Rousou JA, Kisin ER, **Kagan VE**, Das DK: Hypoxic preconditioning preserves antioxidant reserve and prevents calcium overload in the ischemic/reperfused working heart. *Surg. Forum*, 45, pp. 204-212, 1994.
25. **Kagan VE**, Stoyanovsk, DA, Quinn PJ.: 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, pp. 221-248, 1994.
26. **Kagan VE**, Stoyanovsky DA, Goldman R, Darrow RM, Organisciak DT.: 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, pp. 551-560, 1995.
27. **Kagan VE**. Nohl H, Quinn PJ.: 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., pp. 157-201, 1996.
28. Maulik G, **Kagan VE**, Pakrashi S, Maulik N, Das DK.: 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 PJ. **Kagan VE**. Characterisation of clusters of vitamin E in model membranes. *Synchrotron Radiation Department Scientific Reports*, vol. 1, pp. 375-376, RJ Cernik, E. Towns-Andrews, Eds. 1995-1996.
30. Prilipko LL, **Kagan VE**. Free radicals in pathogenesis of mental and neurological disorders. In: *Neuroscience, Neurology and Health*, WHO, Geneva, 1997.
31. **Kagan VE**, Ritov VB, Gorbunov NV, 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, pp. 181-199, 1998.
32. Day BW, Bergamini S, Tyurina YY, Carta G, Tyurin VA, **Kagan VE**. β -Carotene: an antioxidant or a target of oxidative stress in cells? *Subcell Biochem*. 30, pp. 209-217, 1998.
33. **Kagan VE**, Tyurina YY, Witt E. Role of coenzyme Q and superoxide in vitamin E cycling. *Subcell Biochem.*, 30: pp. 491-507, 1998.
34. **Kagan VE**, Ritov VB, Tyurina YY, Tyurin VA. 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, pp. 71-87, 1998.
35. **Kagan VE**, Gorbunov NV. EPR measurements of nitric oxide-induced chromanoxyl radicals of vitamin E. Interactions with vitamin C. *Methods Mol Biol*. vol 108, pp.277-284, 1998.
36. Bayir H, **Kagan VE**. 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, pp. 115-144, 2001.

BOOKS IN RUSSIAN:

1. Kozlov YP, Danilov VS, **Kagan VE** Sitkovsky MV.: Free radical lipid oxidation in biological membranes, Moscow State University Publishing House, Moscow. p.88, 1972.
2. Kozlov YP, **Kagan VE**, Arkhipenko YV.: Molecular Mechanisms of Ca⁺⁺-transporting system damage by molecular oxygen. Irkutsk State University Publishing House, p.136, Irkutsk, 1983.
3. **Kagan VE**, Orlov ON, Prilipko LL.: Quantitative analysis of endogenous products of lipid peroxidation. Publishing House of the USSR Acad. Sci., Ser. Biophysics, vol. 18, p.114, 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 EA, **Kagan VE**. Detection of lipid peroxides in tissues of normal animals. Biochemistry USSR. 1969; 33(3):511-517.
2. Neyfakh EA **Kagan VE**. Accumulation of lipid peroxides in organs of tumour-bearing animals. Biochemistry USSR. 1969; 33(4):692-697.
3. **Kagan VE**, Sytkovsky MV. Lipid peroxidation in tissues and subcellular fractions of tumour-bearing animals. Biology and Soil Sciences, Proc. Moscow State Univ. 1970; 6:117-119.
4. Danilov VS, Sytkovsky MV, **Kagan VE**, Kozlov YP. Polarographic studies of lipid peroxidation under normal and pathological conditions. Biology Bulletin USSR. 1972; 3:574-579.
5. Blokha VV, **Kagan VE**, Sytkovsky MV, Danilov VS, Kols OR, Kozlov YP. Lipid peroxidation and excitation transduction in frog muscle. Biophysics USSR. 1972; 17(3):549-552.
6. **Kagan VE**, Sytkovsky MV, Danilov VS, Kozlov YP. Generation of peroxides in membrane phospholipids and its role in pathogenesis of malignant growth. Proc. Natl. Acad. Sci. USSR. 1973; 208(3):733-735.
7. Kozlov YP, Ritov VB, **Kagan VE**. Ca⁺⁺-transport and free radical lipid oxidation in sarcoplasmic reticulum membranes. Proc. Natl. Acad. Sci. USSR. 1973; 212(5):216-219.
8. Kozlov YP, Gluschenko NN, Obratsov VV, Orlov SN, **Kagan VE**, Danilov VS. Free radical oxidation of lipids in biological membranes. 1. Autooxidation of polyunsaturated fatty acids under various conditions. Biophysics USSR. 1973; 18,1031-1036.
9. Kotelevtsev SV, **Kagan VE**, Arkhipenko YuV, Kozlov YP. Reduction of stable nitroxide radicals in microsomal NADPH- and NADH-dependent electron transporting chains. Biochemistry USSR. 1974; 39(5):1015-1020.
10. Novikov KN, Shvedova AA, **Kagan VE**, Kozlov YP, Ostrovsky MA. Photo-induced changes in photoreceptor membranes and rhodopsin revealed by craft-copolymerisation. Biophysics USSR. 1974; 19(2):280-284.
11. **Kagan VE**, Kotelevtsev SV, Kozlov YP. Role of enzymic lipid peroxidation in disassembly of liver endoplasmic reticulum membranes. Proc. Natl. Acad. Sci. USSR. 1974; 217(1):213-216.
12. Kotelevtsev SV, **Kagan VE**, Arkhipenko YV, Kozlov YP. Study of interrelations between lipid peroxidation and electron transfer in liver microsomes using nitroxide radicals. Studia Biophysica.

1974, 47(2):133-140.

13. Beriya VP, **Kagan VE**, Arkhipenko YV, Kozlov, YP. Antioxidants stabilize cytochrome P-450 in rat liver endoplasmic reticulum membranes. *Biophysics USSR*. 1975; 20(2):238-240.
14. Sibeldina LA, **Kagan VE**, Shvedova AA, Novikov KN, and Kobelev VS. H^1 -NMR study of molecular organization of photoreceptor membranes. *Proc. Natl. Acad. Sci. USSR*. 1975; 224(2):228-231.
15. **Kagan VE**, Sibeldina LA, Ritov VB, Kobelev VS, Kayushin LP, Kozlov, YP. H^1 -NMR study of lipid-protein interactions in sarcoplasmic reticulum membranes. *Proc. Natl. Acad. Sci. USSR*. 1975, 222(5):1223-1226.
16. Bogoslovskaya EP, **Kagan VE**, Gluschenko NN, Erokhin VN, Kozlov YP. Effects of polyunsaturated fatty acids and of products of their autoxidation on ascite carcinoma cells. *Biology Bulletin*, 4, 128-133, 1975.
17. Novikov KN, **Kagan VE**, Shvedova AA, Kozlov YP. Lipid-protein interactions in photoreceptor membranes under lipid peroxidation. *Biophysics USSR*. 1975, 20(6):1039-1042.
18. **Kagan VE**, Shvedova AA, Novikov KN, Kozlov YP. Effects of conformational rearrangements on spontaneous and induced lipid peroxidation in frog retina rod outer segments. *Biophysics USSR*. 1975; 20(6):1043-1048.
19. Kotelevtseva NV, **Kagan VE**, Lankin VZ, Kozlov YP. On the role of "structural factor" in kinetics of free radical lipid oxidation in biomembranes. *Problems Med. Chem*. 1976; 22(3):1039-1042.
20. Ritov VB, **Kagan VE**, Myagkova GI, Moskvina MN, Komarov PG. Interaction of spin-labelled derivatives of saturated and unsaturated fatty acids with lipids and proteins in biomembranes. *Biophysics USSR*. 1976; 21(4):763-765.
21. Kocherginsky NM, **Kagan VE**, Novikov KN, Davydov RM. Possible regulation of the kinetics of non-enzymic reactions in photoreceptor membranes. *Studia Biophysics*. 1976; 58(1):43-50.
22. Novikov KN, Shvedova AA, Tyurin VA, Shukolyukov SA, Kagan, VE. On the role of lipid composition in kinetics of phospholipid free radical oxidation in photoreceptor membranes. *Biophysics USSR*. 1977; 22(5):942-944.
23. **Kagan VE**, Azizova OA, Arkhipenko YV, Kwaan NK, Kozlov YP, Vladimirov, YA. Lipid peroxidation induced functional and structural rearrangements in sarcoplasmic reticulum membranes. *Biophysics USSR*. 1977; 22(4):625-630.
24. Eluashvili IA, Pashinova TP, Bogdanova EP, **Kagan VE**, Prilipko LL. Effects of chlorpromazine on enzymic lipid peroxidation in rat liver microsomes. *Bull. Exp. Biol. Med. USSR*. 1977; 9:323-326.
25. Arkhipenko YV, Bilenko MV, Dobrina SK, **Kagan VE**, Kozlov YP, Shelenkova LN. Damage of sarcoplasmic reticulum in skeletal muscles under ischemia: role of lipid peroxidation. *Bull. Exp. Biol. Med. USSR*. 1977; 6:683-686.
26. **Kagan VE**, Barybina GV, Novikov KN. Lipid peroxidation and degeneration of photoreceptors in the retina of vitamin E-deficient rats. *Bull. Exp. Biol. Med. USSR*. 1977; 4:411-413.
27. Belousova LV, Bratkovskaya LB, Galuschenko IV, **Kagan VE**, Kozlov, YP. Mechanisms of destabilization of photoreceptor membranes modified by reactive oxygen species. *Biochemistry*

USSR. 1977; 42(10):1800-1809.

28. **Kagan VE**, Arkhipenko YV, Dobrina SK, Kozlov YP, Nadirov NK, Pisarev VB, Ritov VB, Khafizov RK. Stabilizing effects of vitamin E in biomembranes exposed to lipid peroxidation. *Biochemistry USSR*. 1977; 42(8):1525-1531.
29. **Kagan VE**, Shukolyukov SA, Tyurin VA, Shvedova AA, Korchagin VP, Galuschenko, IV. Effects of chemical modification of lipids by molecular oxygen on thermal stability of rhodopsin in photoreceptor membranes of wall-eyed pollock. *Studia Biophysica*. 1978; 72(1):51-58.
30. **Kagan VE**, Karagodin VP, Gianik T, Pasechnik VI. Effects of lipid peroxidation and phospholipid hydrolysis products on elasticity of planar bilayer membranes. *Biophysics USSR*. 1978; 23(5):927-929.
31. **Kagan VE**, Tyurin VA, Sepetov NF, Ivanina TA, Shukolyukov SA, Sibeldina LA. H1-NMR study of the role of lipids in thermal stability of rhodopsin in photoreceptor membrane. *Proc.Natl.Acad.Sc.USSR*. 1978; 243(6):1571-1574.
32. Krasnovsky AA, **Kagan VE**. Generation and quenching of singlet oxygen by retinals. *Proc. Natl. Acad. Sci. USSR*. 1978; 242(1):229-232.
33. **Kagan VE**, Eluashvili IA, Prilipko LL. Enzymic lipid peroxidation and oxidative metabolism of chlorpromazine in brain microsomes. *Bull. Exp. Biol. Med. USSR*. 1978; 86(10):432-434.
34. Klaan NK, Tyurin VA, **Kagan VE**, Shukolyukov SA, Novikov KN, Azizova OA, Vladimirov YA, Kozlov YP. Spin-probe study of molecular organization of lipids in photoreceptor membranes. *Biol. Sci.* 1978; 11:39-44.
35. **Kagan VE**, Shvedova AA, Novikov KN. Participation of phospholipases in "repair" of photoreceptor membranes after lipid peroxidation. *Biophysics USSR*. 1978; 23(2):279-284.
36. **Kagan VE**, Prilipko LL, Savov VM, Pisarev VA, Eluashvili IA, Kozlov YP. On participation of free activated oxygen species in enzymic lipid peroxidation in biomembranes. *Biochemistry USSR*. 1979; 44(3):482-489.
37. **Kagan VE**, Churakova TD, Karagodin VP, Arkhipenko YV, Bilenko MV, Kozlov YP. Effects of phospholipid hydroperoxides and fatty acid hydroperoxides on Ca^{++} transport in sarcoplasmic reticulum membranes. *Bull. Exp. Biol. Med. USSR*. 1979; 2:145-149.
38. Faktor VM, Uryvaeva IV, **Kagan VE**. Heterogeneity of cytochrome P-450 distribution in liver lobes, revealed by the effects of carbon tetrachloride. *Bull. Exp. Biol. Med. USSR*. 1979; 4:364-366.
39. **Kagan VE**, Lankin VZ, Shvedova AA, Novikov KN, Dobrina SK, Bratkovskaya LB, Kuliev IY. Enzymic and non-enzymic protective antioxidant systems in photoreceptors. *Bull. Exp. Biol. Med. USSR*. 1979; 8:164-166.
40. Meerson FZ, **Kagan VE**, Prilipko LL, Rozhitskaya II, Giber LM, Kozlov YP. Lipid peroxidation stimulation in animals under emotional-painful stress. *Bull. Exp. Biol. Med. USSR*. 1979; 10:404-406.
41. Meerson FZ, **Kagan VE**, Golubeva LY, Ugolev AA, Shimkovich MV, Giber LM, Rozhitskaya II. Prevention of stressory and hypoxic damage of the heart by antioxidant BHT. *Soviet Cardiology*. 1979; 8:108-111. (in Russian)

42. Arkhipenko YV, Bilenko MV, **Kagan VE**, Churakova T.D, Shelenkova LN. The role of lipid peroxidation in skeletal muscles sarcoplasmic reticulum damage under ischemia. *Soviet Surgery*. 1979; 7:106.
43. Meerson FZ, **Kagan VE**, Rozhitskaya II, Prilipko LL. Inhibitory effects of BHT and gamma-hydroxybutyrate on lipid peroxidation under emotional-painful stress. *Bull. Exp. Biol. Med. USSR*. 1980; 12:661-663.
44. Savov VM, Eluashvili IA, Pisarev VA, Prilipko LL, **Kagan VE**. NADPH- and organic hydroperoxides-dependent oxidation of epinephrine to adrenochrome in brain and liver microsomes. *Bull. Exp. Biol. Med. USSR*. 1980; 11:557-559.
45. Shukolyukov SA, Kalishevich OO, Tyurin VA, Dikarev VP, Korchagin VP, Kotelevtsev SV, **Kagan VE**, Mizner BI, Sokolova IA. Chromatography, delipidation and formation of recombinants of rhodopsin from wall-eyed pollock's photoreceptors. *Biochemistry USSR*. 1980; 45(10):1767-1772.
46. Korchagin VP, Bratkovskaya LB, Shvedova AA, Arkhipenko YV, **Kagan VE**, Shukolyukov SA. Oligomerization of intrinsic membrane proteins in the course of lipid peroxidation. *Biochemistry USSR*. 1980; 45(10):1767-1772.
47. Gamrekeli DV, Savov VM, Stepanova LI, **Kagan VE**. Interrelations between enzymic lipid peroxidation and benz(a)pyrene hydroxylation in rat liver microsomes. *Biol. Sci.* 1980; 8:21-24.
48. Meerson FZ, Malyshev VV, **Kagan VE**, Treschuk LI, Rozhitskaya, I.I. Activation of lipid peroxidation and focal contractures in the heart muscle of rats exposed to emotional-painful stress. *Soviet Arch. Pathol.* 1980; 42(2):9-12.
49. Tabidze LV, **Kagan VE**, Shukolyukov SA, Ivanov II. Does a-tocopherol stabilize rhodopsin in photoreceptor membrane? *Biophysics USSR*. 1980; 25(2):340-341.
50. Savov VM, **Kagan VE**, Prilipko LL. Participation of activated oxygen species and peroxy radicals in rat liver microsomal lipid peroxidation, induced by organic hydroperoxides. *Problems Med. Chem.* 1980; 5:623-627.
51. Meerson FZ, **Kagan VE**, Arkhipenko YV, Belkina LM, Rozhitskaya II. Prevention of lipid peroxidation activation in myocardium under stress and experimental infarction. *Soviet Cardiol.* 1980; 21:55-59.
52. Meerson FZ, Arkhipenko YV, Rozhitskaya II, **Kagan VE**. Effects of adaptation to hypoxia on lipid peroxidation stimulation and antioxidant systems in myocardium under stressory and ischemic damage of the heart. *Soviet Cardiol.* 1980; 12:55-60.
53. **Kagan VE**, Kuliev IY, Spirichev VB, Shvedova AA, Kozlov YP. 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*. 1981; 2:165-167.
54. Meerson FZ, Arkhipenko YV, Rozhitskaya II, **Kagan VE**. Disturbances in Ca⁺⁺-transporting system of rat heart sarcoplasmic reticulum under emotional-painful stress. *Bull. Exp. Biol. Med. USSR*. 1981; 4:405-406.
55. Velikhanova DM, Bilenko MV, **Kagan VE**. Lipid peroxidation and damage of mixed function oxidases in endoplasmic reticulum membranes under liver ischemia. *Bull. Exp. Biol. Med. USSR*. 1981; 7:50-52.

56. Libe ML, Bogdanova EP, Rosenberg AE, Prilipko LL, **Kagan VE**, Kozlov YP. H³-hydroxytryptamine and H³-diazepam binding and lipid peroxidation in brain membrane fractions. *Bull. Exp. Biol. Med. USSR*. 1981; 11:552-554.
57. Bogdanova EP, **Kagan VE**, Kuliev IY, Meerson FZ, Prilipko LL. Stress-induced activation of lipid peroxidation in brain and appearance of antibodies to brain antigens. *Immunology USSR*. 1981; 2:65-66.
58. Sokolov VS, Churakova TD, Bulgakov VG, **Kagan VE**, Bilenko MV, Boguslavsky LI. Effects of lipid peroxidation products on permeability of bilayer lipid membranes. *Biophysics USSR*. 1981; 26(1):149-147.
59. Bratkovskaya LB, Novikov KN, Shvedova AA, Polischuk RF, **Kagan VE**, Kozlov YP. Pyridinenucleotide-dependent systems of lipid peroxidation induction in retina photoreceptors. *Biol. Sci.* 1981; 6:21-26.
60. **Kagan VE**, Kozlov YP, Bilenko MV, Stepanova LI, Serbinova EA, Velikhanova DM, Savov VM. On participation of lipid peroxidation in circadian changes of cytochrome P-450 content in liver endoplasmic reticulum membranes. *Biol. Sci.* 1981; 11:26-29.
61. **Kagan VE**, Kopaladze RA, Prilipko LL, Libe ML, Turova NF, Kozlov YP. On the mechanisms of toxic effects of hyperbaric oxygenation on the brain. *Biol. Sci.* 1982; 5:26-30.
62. Prilipko LL, Orlov ON, Ivanova SM, **Kagan VE**, Meerson FZ, Ushakov AS. Stress-induced activation of lipid peroxidation in humans evaluated by pentane content in the exhaled air. *Proc. Natl. Acad. Sci. USSR*. 1982; 265(4):1010-1015.
63. Meerson FZ, **Kagan VE**, Kozlov YP, Belkina LM, Arkhipenko YV. Lipid peroxidation in ischemia and antioxidants in protection of the heart. *Soviet Cardiol.* 1982; 2:81-92.
64. Kuliev IY, Shvedova AA, **Kagan VE**, Krasnovsky AA, Kozlov YP. Light-induced damage of the retina: participation of singlet oxygen and lipid peroxidation. *Proc. Natl. Acad. Sci. USSR*. 1982; 263(5):1005-1009.
65. Vokk PA, **Kagan VE**, Sukhareva NN. Effects of ozone on superoxide dismutase activity in some microorganisms. *Biol. Sci.* 1982; 10:95-98.
66. Meerson FZ, Krasikov SI, Boev VM, **Kagan VE**. Effect of antioxidants on the resistance of untrained organism to exhausting physical loading. *Bull. Exp. Biol. Med. USSR*. 1982; 7:17-19.
67. Shvedova AA, **Kagan VE**, Kuliev IY, Dobrina SK, Prilipko LL, Meerson FZ, Kozlov YP. Lipid peroxidation and damage of the retina in stress-exposed rats. *Bull. Exp. Biol. Med. USSR*. 1982; 4:24-27.
68. Kozlov YP, **Kagan VE**, Beim AM, Dobrina SK, Kotelevtsev SV, Novikov KN, Savov VM, Serbinova EA. 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. Sci.* 1983; 1:20-25.
69. Polyansky NB, Smirnov LD, Shvedova AA, **Kagan VE**, Tkachuk VA. Inhibition of phosphodiesterase of cyclic nucleotides from rabbit heart by hydroxypyridines. *Problems Med. Chem.* 1983; 1:123-127.

70. **Kagan VE**, Arkhipenko YV, Kozlov YP. 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*. 1983; 48(1):158-166.
71. **Kagan VE**, Arkhipenko YV, Ritov VB, Kozlov YP. Effects of lipid peroxidation on enzymic Ca^{++} -transporting system in sarcoplasmic reticulum membranes. Molecular mechanisms of membrane Ca^{++} -permeability increase. *Biochemistry USSR*. 1983; 48(2):320-330.
72. **Kagan VE**, Arkhipenko YV, Kozlov YP. Effects of lipid peroxidation on enzymic Ca^{++} -transporting system in sarcoplasmic reticulum membranes. Molecular mechanisms of changes of Ca^{++} -ATPase activity. *Biochemistry USSR*. 1983; 48(3):433-441.
73. Klaan NK, Azizova OA, Sibeldina LA, Arkhipenko YV, **Kagan VE**. Effects of lipid peroxidation on enzymic Ca^{++} -transporting system in sarcoplasmic reticulum membranes. Rearrangements in molecular organization of membrane lipids. *Biochemistry USSR*. 1983; 48(4):626-633.
74. Azizova OA, Maksina AG, Klaan NK, Sukhanov VA, Arkhipenko YV, **Kagan VE**, Vladimirov YA, Kozlov YP. Effects of lipid peroxidation on enzymic Ca^{++} -transporting system in sarcoplasmic reticulum membranes. Changes in molecular organization of Ca^{++} -ATPase lipoprotein complex. *Biochemistry USSR*. 1983; 48(5):861-868.
75. **Kagan VE**, Arkhipenko YV, Meerson FZ, Kozlov YP. Effects of lipid peroxidation on enzymic Ca^{++} -transporting system in sarcoplasmic reticulum membranes. In vivo damage under pathological conditions. *Biochemistry USSR*. 1983; 48(7):1141-1148.
76. Arkhipenko YV, Pisarev VA, **Kagan VE**. 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*. 1983; 48(8):1261-1270.
77. Bilenko MV, **Kagan VE**, Velikhanova DM, Komarov PG. Protective effects of antioxidants and inducers of microsomal monooxygenases against ischemic/reoxygenation injury of the liver. *Bull. Exp. Biol. Med. USSR*. 1983; 4:30-33.
78. Kozlov YP, **Kagan VE**, Biem AM, Novikov KN, Savov VM, Minin AA, Serbinova EA. 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. Sci.* 1983; 5:18-23.
79. Glazer VM, **Kagan VE**, Abilev SK, Biem AM, Savov VM, Kozlov YP. 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. Sci.* 1983; 9:91-94.
80. Osipov AN, Savov VM, Yakhyaev AV, Zubarev VE, Azizova OA, **Kagan VE**, Kozlov YP, Vladimirov YA. The role of free radicals, formed by the Fe/ascorbate system in induction of lipid peroxidation. *Biophysics USSR*. 1983; 28(2):2094-2096.
81. Erin AN, Spirin MM, Tabidze LV, **Kagan VE**. Mechanisms of stabilization of biomembranes by vitamin E. Formation of complexes of alpha-tocopherol with fatty acids. *Biochemistry USSR*. 1983; 48(11):1855-1866.

82. **Kagan VE**, 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. 1983; 4:46-48.
83. Serbinova EA, Savov VM, **Kagan VE**. Stimulation of proteolytic degradation of cytochrome P-450 in rat liver microsomes after lipid peroxidation. Bull. Exp. Biol. Med. USSR. 1983; 6:53-55.
84. Shvedova AA, **Kagan VE**, Kuliev IY, Vekshina OM. Mechanisms of retina damage by fluorescent dyes. Bull. Exp. Biol. Med. USSR. 1983; 8:48-50.
85. Prilipko LL, Orlov ON, **Kagan VE**, Savov VM, Saltanov AI, Uvarova EB, Shapot VS. Accumulation of volatile products of lipid peroxidation in exhaled air of humans exposed to hyperbaric oxygenation. Bull. Exp. Biol. Med. USSR. 1983; 10:24-26.
86. Kovaleva ES, Prilipko LL, Muranov KO, **Kagan VE**. Effects of antioxidants on H³-hydroxytryptamine release and uptake by rat brain synaptosomes. Bull. Exp. Biol. Med. USSR. 1983; 10:55-57.
87. Babijaev MA, Savov VM, **Kagan VE**. Formation of complexes of superoxide anions with Ca⁺⁺. Bull. Exp. Biol. Med. USSR. 1983; 11:47-48.
88. Novikov KN, Dudchenko AM, Ugolev AT, Kuznetsova ZI, Lukjanova LD, **Kagan VE**. Stabilizing effects of antioxidants on cytochrome P-450 in hepatocytes. Bull. Exp. Biol. Med. USSR. 1983; 11:50-52.
89. Prilipko LL, **Kagan VE**, Meerson FZ, Bogdanova ED, Brusovanik VI, Orlov ON, Arkhipenko YV. The role of lipids in modification of brain beta-receptors under emotional-painfull stress. Bull. Exp. Biol. Med. USSR. 1983; 11:6-8.
90. Tabidze LV, Ritov VB, **Kagan VE**, Kozlov YP. Vitamin E protects sarcoplasmic reticulum membranes against damage induced by free fatty acids. Bull. Exp. Biol. Med. USSR. 1983; 11:48-50.
91. Meerson FZ, Sazontova TG, **Kagan VE**, Tverdokhlib VP, Arkhipenko YV. The role of lipid peroxidation in inhibition of rat heart Na,K-ATPase under stress. Bull. Exp. Biol. Med. USSR. 1983, 12:42-44.
92. **Kagan VE**, Kopaladze RA, Prilipko LL, Savov VM. The role of lipid peroxidation induced hydroxytryptamine receptor modification in the formation of epileptiformic convulsions. Bull. Exp. Biol. Med. USSR. 1983; 12:16-18.
93. Krasnovsky AA, Minin AA, **Kagan VE**. Mechanisms of singlet oxygen luminescence quenching by saturated and unsaturated fatty acids. Proc. Natl. Acad. Sci. USSR. 1983; 268(6):1488-1491.
94. Prilipko LL, **Kagan VE**, Tjurin VA, Gorbunov NV, Bogdanova ED. Modification of lipids and changes in beta-receptors in brain synaptosomes. Proc. Natl. Acad. Sci. USSR. 1983; 269(5):1260-1263.
95. **Kagan VE**, Bratkovskaya LB, Kuliev IY, Shvedova AA. Role of lipid peroxidation in retina damage under hyperbaric oxygenation and possibility of chemical protection by antioxidants. Proc. Natl. Acad. Sci. USSR. 1983; 271(1):227-230.
96. Erin AN, Skrypin VI, **Kagan VE**. Formation of complexes between alpha-tocopherol and fatty acids. The nature of complexes. Proc. Natl. Acad. Sci. USSR. 1983; 273(2):489-493.

97. Kreps EM, Tjurin VA, Gorbunov NV, Brusovanik VI, Prilipko LL, **Kagan VE**. Formation of monoacylglycerophosphatides in the course of interactions of ligands with receptors. A possible mechanism of receptor desensitization. Proc. Natl. Acad. Sci. USSR. 1983; 273(3):753-757.
98. Meerson FZ, Berestneva ZV, Boev VM, **Kagan VE**, Prilipko LL, Golubeva LY. Effects of antioxidant on heart contractility and physical endurance in humans. Theory and Practice of Physical Culture. 1983; 9:37-42.
99. Polyansky NB, Smirnov LD, Shvedova AA, **Kagan VE**. Inhibition of cyclic nucleotide phosphodiesterase in frog rod outer segments membranes by 3-hydroxypyridines. Biol. Sci. 1984; 1:27-31.
100. Glazer VM, Savov VM, Abilev SK, Shesterin SI, Beim AM, **Kagan VE**. 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.Sci. 1984; 5:85-89.
101. **Kagan VE**, Savov VM, Serbinova EA. 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. 1984; 10(2):73-81.
102. **Kagan VE**, Savov VM, Serbinova EA. 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. 1984; 10(2):82-90.
103. Novikov KN, Viner RI, Dudchenko AM, Ugolev AT, Lukyanova LD, **Kagan VE**. Products of hydrophobic xenobiotics hydroxylation - stabilizers of cytochrome P-450 in hepatocytes. Bull. Exp. Biol. Med. USSR. 1984; 9:294-296.
104. Dupin AM, Boldyrev AA, Arkhipenko YV, **Kagan VE**. Protection by carnosine against damage induced in sarcoplasmic reticulum membranes by lipid peroxidation. Bull. Exp. Biol. Med. USSR. 1984; 8:186-188.
105. **Kagan VE**, Savov VM, Didenko VV, Arkhipenko YV, Meerson FZ. Interrelations between activity of antioxidant systems and endogenous lipid peroxidation in the left and right ventricles of the myocardium. Bull. Exp. Biol. Med. USSR. 1984; 6:664-666.
106. Erin AN, Skrypin VI, Prilipko LL, **Kagan VE**. Formation of complexes of butylated hydroxytoluene with fatty acids. Bull. Exp. Biol. Med. USSR. 1984; 5:572-574.
107. **Kagan VE**, Polyansky NB, Muranov KO, Shvedova AA, Smirnov LD, Dyumaev KM. Suppression of aggregation and inhibition of phosphodiesterase of cyclic nucleotides in platelets by 3-hydroxypyridines. Bull. Exp. Biol. Med. USSR. 1984; 4:416-418.
108. Meerson FZ, Didenko VV, Savov VM, Kopaladze RA, Dosmagambetova RS, Kagan, VE. Lipid peroxidation under experimental myocardial infarction: effect of hyperbaric oxygenation. Bull. Exp. Biol. Med. USSR. 1984; 10:398-400.
109. Pliquet F, Sergienko VV, Wunderlich Z, **Kagan VE**. Changes of passive electric properties of red blood cells after haemosorbition. Bull. Exp. Biol. Med. USSR. 1984; 10:414-416.
110. Grinio LP, Orlov ON, Prilipko LL, **Kagan VE**. Lipid peroxidation in children with inherited

Duschenne myopathy. Bull. Exp. Biol. Med. USSR. 1984; 10:423-425.

111. Polyansky NB, Smirnov LD, Shvedova AA, **Kagan VE**. Inhibition of cyclic nucleotide phosphodiesterase from frog rod outer segments by 3-hydroxypyridines. Biol. Sci. 1984; 1:27-31.
112. Minin AA, Grigoryan GY, **Kagan VE**, Tkachuk VA. Reconstitution of hormone-sensitive adenylate cyclase after solubilization by sodium cholate. Biol. Membranes (USSR). 1984; 1(7):691-695.
113. Osipov AN, Savov VM, Yakhyaev AV, Zubarev VE, Azizova OA, **Kagan VE**, Vladimirov YA. Spin-trapping study of radicals, generated during interaction of organic hydroperoxides with iron. Biophysics USSR. 1984; 29(4):533-537.
114. Azizova OA, Osipov AN, Savov VM, Zubarev VE, **Kagan VE**, Vladimirov YA. Spin-trapping study of linolenic acid radicals formed in Fenton system. Biophysics USSR. 1984; 29(5):766-770.
115. Ananieva LK, Ivanov II, Tabidze LV, **Kagan VE**. Mechanism of Ca-ATPase stabilization by vitamin E against thermal denaturation stimulated by fatty acids. Biochemistry USSR. 1984; 49(1):60-67.
116. **Kagan VE**, Tyurin VA, Gorbunov NV, Prilipko LL, Chelomin VP. Is microviscosity changes and asymmetrical distribution of phospholipids in the membrane an obligatory prerequisite for signal transduction? J. Evol. Biochem. Physiol. USSR. 1984; 20(1):9-15.
117. **Kagan VE**, Prilipko LL, Savov VM. Formation of inhibitors of lipid peroxidation during oxidative metabolism of hydrophobic xenobiotics catalyzed by mixed function oxygenases. Acta Physiol. Pharmacol. Bulgarica. 1984; 10(3):46-56.
118. Passechnik VI, Hianik T, Karagodin VP, **Kagan VE**. Elasticity, strength and stability of bilayer lipid membranes and their changes due to phospholipid modification. Gen. Physiol. Biophys. 1984; 3(6):475-482.
119. Meerson FZ, **Kagan VE**. 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 FZ, Ed., Moscow, Medicine Publishing House. 1984; 122-135.
120. Komarov PG, Bilenko MV, Shvedova AA, **Kagan VE**. Evaluation of the efficiency of different compounds in inhibition of enzymic lipid peroxidation. Problems Med. Chem. 1985; 2:40-45.
121. **Kagan VE**, Serbinova EA, Minin AA, Savov VM, Novikov KN, Osipov AN, Zubarev VE, Azizova OA. Study of the mechanism of initiation of enzymic NADPH-dependent lipid peroxidation in liver endoplasmic reticulum membranes. Biochemistry USSR. 1985; 50(6):986-991.
122. Erin AN, Tyurin VA, Brusovanik VI, Gorbunov NV, Selischeva AA, Prilipko LL, **Kagan VE**. Changes of physico-chemical properties of synaptosomal membranes treated by phospholipase A₂. Biochemistry USSR. 1985; 50(3):507-513.
123. Savov VM, Osipov AN, Ozhogina OA, Novikov KN, Zubarev VE, Azizova OA, **Kagan VE**. Mechanism of initiation of lipid peroxidation in system containing phenazine-methasulfate/NADH. Biophysics USSR. 1985; 30(4):598-601.
124. Skrypin VI, Erin AN, Bratkovskaya LB, **Kagan VE**. Alpha-tocopherol - a modifier of the phase transitions in the lipid bilayer. Bull. Exp. Biol. Med. USSR. 1985; 12:673-675.
125. Balevska PS, Kassabova TA, Russanov EM, **Kagan VE**. Inhibition of phospholipid hydrolysis by

phospholipase A₂ in microsomal and mitochondrial membranes, preexposed to lipid peroxidation. Bull. Exp. Biol. Med. USSR. 1985; 2:161-164.

126. Babijaev MA, Shvedova AA, Arkhipenko YV, **Kagan VE**. Accumulation of lipid peroxidation products in cataract lenses. Bull. Exp. Biol. Med. USSR. 1985; 9:299-301.
127. Orlov ON, Prilipko LL, Rodionov VV, Demurov EA, **Kagan VE**, Meerson FZ, Efuni SN. Estimation of endogenous lipid peroxidation level in humans, exposed to hyperbaric oxygenation. Proc. Natl. Acad. Sci. USSR. 1985; 283(2):493-496.
128. Savov VM, Didenko VV, Dasmagambedova RS, Meerson FZ, **Kagan VE**. Lipid peroxidation in myocardium under experimental infarction. Biol.Sci. 1985; 5:30-33. (in Russian).
129. Azizova OA, Osipov AN, Savov VM, Yakhyaev AV, Zubarev VE, **Kagan VE**, Vladimirov YA. Mechanisms of initiation of non-enzymic lipid peroxidation in system: Fe⁺⁺-ascorbate -linolenic acid. Biophysics USSR. 1985; 30(1):36-39.
130. Badalyan LO, Grinio LP, Islamova IB, Belousova LV, Rafanov VS, Prilipko LL, **Kagan VE**. On the pathology of membrane structures under Duschenne myodystrophy in humans. Soviet Journ. Neuropath. Psychiatry. 1985; 85(11):1631-1633.
131. Arkhipenko YV, Meerson FZ, Sazontova TG, **Kagan VE**. Mode of lipid-peroxidation induced inhibition of Na,K-ATPase. Acta Physiol. Pharmacol. Bulgarica. 1985; 11(1):70-78.
132. Serbinova EA, Tyurin VA, Stoytchev TS, **Kagan VE**. Is a relay mechanism of antioxidant effect of tocopherols valuable for membrane structures? Acta Physiol. Pharmacol. Bulgarica. 1985; 11(3):55-60.
133. Novikov KN, **Kagan VE**. Stabilization of cytochrome P-450 in hepatocytes by free radical scavengers of different nature. Acta Physiol. Pharmacol. Bulgarica. 1985; 11(3):61-69.
134. **Kagan VE**, Monovich O, Ribarov SR. Induction of lipid peroxidation in red blood cells in the course of cholesterol oxidation, catalyzed by cholesterol-oxidase. Bull. Exp. Biol. Med. USSR. 1985; 8:179-181.
135. Erin AN, Skrypin VI, Prilipko LL, **Kagan VE**. Formation of complexes of alpha-tocopherol with phosphatidic acid. Bull. Exp. Biol. Med. USSR. 1985; 8:184-186.
136. Skrypin VI, Erin AN, **Kagan VE**, Prilipko LL. Interaction of alpha-tocopherol with free fatty acids. Spatial organization of the complex. Bull. Exp. Biol. Med. USSR. 1986; 6:682-684.
137. Savov VM, Babijaev MA, **Kagan VE**. Mechanisms of Ca⁺⁺ effects on lipid peroxidation. Bull. Exp. Biol. Med. USSR. 1986; 6:693-695.
138. Erin AN, Skrypin VI, Prilipko LL, **Kagan VE**. Mechanism of stabilization of synaptosomes by alpha-tocopherol during exposure to phospholipase A₂. Bull. Exp. Biol. Med. USSR. 1986; 7:25-28.
139. **Kagan VE**, Skrypin VI, Serbinova EA, Raikova DP, Tyurin VA, Stoytchev TS. Localization of alpha-tocopherol in the hydrophobic zone of a lipid bilayer. Proc. Natl. Acad. Sci. USSR. 1986; 288(5):1242-1246.
140. Serbinova EA, Bakalova RA, Stoytchev TS, **Kagan VE**. Efficiency of lipid peroxidation inhibition in biomembranes by antioxidants with and without hydrocarbon chains. Bull. Exp. Biol. Med. USSR. 1986; 10:419-421.

141. Muranov KO, Polyansky NB, Shvedova AA, Smirnov LD, **Kagan VE**. Changes in the cyclic nucleotide level and the inhibition of human platelet aggregation in 3-hydroxypyridine exposure. Bull. Exp. Biol. Med. USSR. 1986; 10:432-434.
142. Meerson FZ, Sazontova TG, Arkhipenko YV, **Kagan VE**. 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. 1986; 32(5):67-71.
143. Volkovitskaya OE, Bochev PG, Ribarov SR, Gorkin VZ, **Kagan VE**. Study of monoamine oxidase from human placenta mitochondria by the chemiluminescent method. Problems Med. Chem. 1986; 32(5):77-79.
144. **Kagan VE**, Ivanova SM, Murzakhmetova MK, Shvedova AA, Smirnov LD. Antioxidants - stabilizers of the C⁺⁺-transport enzyme system in sarcoplasmic reticulum membranes in vivo. Bull. Exp. Biol. Med. USSR. 1986, 11:52-54.
145. Volkovitskaya OE, Bochev PG, Ribarov SR, Gorkin VZ, **Kagan VE**. Formation of superoxide anion-radical during the oxidation of biogenic amines catalyzed by mitochondrial monoamine oxidase. Bull. Exp. Biol. Med. USSR. 1986; 12:687-689.
146. Tyurin VA, **Kagan VE**, Serbinova EA, Gorbunov NV, Erin AN. The interaction of alpha-tocopherol with phospholipid liposomes: the absence of transbilayer mobility. Bull. Exp. Biol. Med. USSR. 1986; 12:689-692.
147. Balevska PS, Tyurin VA, Kassabova TA, Russanov EM, **Kagan VE**. Inhibition of phospholipid hydrolysis by soluble phospholipase A₂ in biological membranes of different origin after lipid peroxidation. Acta Physiol. Pharmacol. Bulgarica. 1986; 12(3):58-65.
148. Kreps EM, Tyurin VA, Gorbunov NV, Maksimovich AA, Polyakov VN, Plyusnin VV, **Kagan VE**. Activation of lipid peroxidation during spawning migration stress in salmon: a possible mechanism of adaptation. Proc. Natl. Acad. Sci. USSR. 1986; 286(4):1009-1012.
149. Viner RI, Novikov KN, Arkhipenko YV, Skrypin VI, Kozlov YP, Spirichev VB, **Kagan VE**. Nonantioxidant mechanism of cytochrome P-450 stabilization by alpha-tocopherol: efficiency in vitamin E-deficient animals. Biochemistry USSR. 1986; 51(9):1549-1554.
150. Babijaev MA, Arkhipenko YV, **Kagan VE**. Activity of antioxidant enzymes and metabolism of peroxide compounds in the cataract lenses. Bull. Exp. Biol. Med. USSR. 1987; 2:143-146.
151. Erin AN, Gorbunov NV, Skrypin VI, **Kagan VE**, Prilipko LL. Interaction of alpha-tocopherol with free fatty acids. Mechanism of stabilization of lipid bilayer microviscosity. Biol. Sci. 1987, 1:10-16.
152. Shvedova AA, Platonov ES, Polyansky NB, Babijaev MA, **Kagan VE**. The chemical nature of the fluorescent products accumulating in the lipids of the lenses of mice with hereditary cataract. Bull. Exp. Biol. Med. USSR. 1987; 3:301-304.
153. Viner RI, Novikov KN, Kozlov YP, **Kagan VE**. Does alpha-tocopherol interact with the active site of cytochrome P-450 in liver microsomes? Bull. Exp. Biol. Med. USSR. 1987; 3:304-306.
154. Viner RI, Novikov KN, Kozlov YP, **Kagan VE**. Inhibition of the dealkylating activity of cytochrome P-450 isoforms in rat liver microsomes by the products of phospholipase A₂-induced phospholipid hydrolysis. Biochemistry USSR. 1987; 52(3):459-468.

155. **Kagan VE**, Serbinova EA, Bakalova RA, Stoytchev TS, Erin AN. Mechanisms of biomembrane stabilization by alpha-tocopherol. The role of the isoprenoid chain in the inhibition of lipid peroxidation. Proc. Natl. Acad. Sci. USSR. 1987; 295(3):728-731.
156. Simidjiev I, **Kagan VE**, Minkov IB. Effect of alpha-tocopherol and its derivatives on ATPase and oxidative phosphorylation in rat liver mitochondria. Bull. Exp. Biol. Med. 1987; 9:299-301.
157. Tyurin VA, Korolkov SN, Berman AL, **Kagan VE**. Structural stabilization of lipids and visual pigment rhodopsin in the photoreceptor membrane by vitamin E. Bull. Exp. Biol. Med. USSR. 1987; 10:391-394.
158. Sukhareva-Nemakova NN, Vokk RA, **Kagan VE**. Changes in the phospholipid composition of microorganisms induced by ozone. Biol. Bull. USSR. 1987; 6:871-880.
159. Kreps EM, Tyurin VA, Chelomin VP, Gorbunov NV, Nalivaeva NN, Tyurina YY, Avrova NF, **Kagan VE**. Study of mechanisms of initiation of lipid peroxidation in synaptosomes from the brain of marine teleosts. J. Evol. Biochem. Physiol. USSR. 1987; 23(4):461-467.
160. Erin AN, Davitashvili NG, Prilipko LL, Boldyrev AA, Luschak VI, Batrakov SG, Pridachina NN, Serbinova EA, **Kagan VE**. Effects of alkylresorcinol on biomembranes under activation of lipid peroxidation. Biochemistry USSR. 1987; 52(7):1180-1185.
161. Tyurin VA, **Kagan VE**, Avrova NF, Prozorovskaya MP. Lipid asymmetry and alpha-tocopherol distribution in outer and inner monolayers of bilayer lipid membranes. Bull. Exp. Biol. Med. USSR. 1988; 6:667-669.
162. Erin AN, Davitashvili NG, **Kagan VE**, Zakharova EI, Sarycheva IK, Evstigneeva RP. The role of isoprenoid chain of alpha-tocopherol in protection of synaptosomes against lipid peroxidation and damaging effects of phospholipase A₂. Biochemistry USSR. 1988; 53(4):591-597.
163. Bakalova RA, Nekrasov AS, Lankin VZ, **Kagan VE**, Stoytchev TS, Evstigneeva RP. 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. 1988; 299(4):1008-1011.
164. Gotlib VA, Tyurin VA, Rychkova MP, Berman AL, Lev AA, **Kagan VE**. Differential scanning microcalorimetry study of stabilizing effects of alpha-tocopherol on rhodopsin under damaging action of free fatty acids. Bull. Exp. Biol. Med. USSR. 1989; 1:132-137.
165. Bekiarova GI, Markova MP, **Kagan VE**, Alpha-tocopherol protection of erythrocytes from hemolysis induced by thermal injury. Bull. Exp. Biol. Med., 107(4):413-415, 1989.
166. Antipov AD, Tyurin VA, Avrova NF, Khovanskiy AE, **Kagan VE**. Protection of monoamine oxidase by water- and lipid-soluble antioxidants under lipid peroxidation in brain synaptosomes. Bull. Exp. Biol. Med. USSR. 1989; 2:169-171.
167. Serbinova EA, Kadiiska MB, Tyurin VA, **Kagan V**. The protective effects of water- and lipid-soluble antioxidants on cytochrome P-450 under lipid peroxidation in liver microsomes. Bull. Exp. Biol. Med. USSR. 1989; 2:187-188.
168. **Kagan VE**, Tyurin VA, Kitanova SA, Serbinova EA, Quinn PJ, Stoytchev TsS. The effects of ubiquinol homologues on lipid peroxidation in membranes of brain mitochondria and synaptosomes. Bull. Exp. Biol. Med. USSR. 1989; 4:420-422.

169. Tyurin VA, Korolkov SN, **Kagan VE**. Transbilayer distribution of a-tocopherol and asymmetry of lipids in neural membranes. *Biochemistry USSR*. 1989; 54:940-947.
170. Koynova GM, Markovska D, Staneva D, **Kagan VE**. 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*. 1990; 109(1): 35-37.
171. Rangelova DA, Zhelev ZhZh, Bakalova RA, Denisova NK, Tyurin VA, Serbinova EA, **Kagan VE**, Packer L. Intermembrane transfer and antioxidant effects of alpha-tocopherol in liposomes. *Bull. Exp. Biol. Med. USSR*. 1990; 109(1):37-39.
172. Tyurina YY, Tyurin VA, Avrova NF, **Kagan VE**. Ganglioside-dependent factor inhibiting lipid peroxidation in synaptosomal membranes. *Bull. Exp. Biol. Med. USSR*. 1990; 109(6):553-555.
173. Stoyanovsky DA, **Kagan VE**, Afanas'ev IB. Effect of ascorbic acid on decomposition of arachdinate-15-hydroperoxide in the presence of iron salts and complexes. *Bull. Exp. Biol. Med. USSR*. 1990; 110:1485-1488.
174. Kharfuf M, Serbinova EA, Komissarov VP, Erin AN, Rakovski S, Bakalova RA, Savov VM, **Kagan VE**. Mechanisms of the antioxidant action of hindered phenols. Membrane effects of BHT derivatives on luminol-dependent chemiluminescence. *Bull. Exp. Biol. Med. USSR*. 1990; 110: 480-483.
175. Serbinova EA, Kharfuf M, Ukhin LY, Komissarov VP, Rakovsky , **Kagan VE**. Mechanisms of the antioxidant action of hindered phenols. Effects of BHT derivatives in membranes. *Bull. Exp. Biol. Med. USSR*. 1990; 110:486-489.
176. Tyurin VA, Kuznetsova LA, Tyurina YY, Erin AN, Avrova NF, Pertseva MN, **Kagan VE**. Participation of gangliosides in protecting beta-adrenoreceptors against damage by lipid peroxidation in synaptosomes. *Bull. Exp. Biol. Med. Rus*. 1991; 111:597-599.
177. Konorev EA, Saks VA, Rudnev DV, Konorev LA, Sharov VG, **Kagan VE**, Pichugin VV, Evstigneeva RP. 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*. 1991; 3:35-39.
178. Gorbunov NV, **Kagan VE**, Alekseev SM, Erin AN. Role of isoprenoid chain in lateral mobility of alpha-tocopherol in lipid bilayer. *Bull. Exp. Biol. Med. Rus*. 1991; 112:39-41.
179. Bakalova RA, Sokolova T, Ribarov S, **Kagan V**. Effects of alpha-tocopherol and its homologues on luminol-de[endent chemiluminescence induced by (Fe²⁺ + NADPH) and (Fe²⁺ + ascorbate) in rat liver microsomes. *Bull. Exp. Biol. Med. Rus*. 1991; 112(11): 482-485.
180. Kovacheva-Ivanova S, Bakalova R, **KaganV**, Georgiev, G. Activation of lipid peroxidation and changes in the vitamin E level in the lungs under oxidative stress. *Bull. Exp. Biol. Med. Rus*. 1992; 113(2):132-134.
181. Tyurin VA, Bagrov AI, Fedorova OV, Zhabko EP, Tyurina JJ, Avrova NF, Das DK, **Kagan VE**. Protection of the erythrocyte membranes by gangliosides in myocardial ischemia. *Bull. Exp. Biol. Med. Rus*. 1992; 114(10):366-368.
182. Tyurin VA, Erin AN, Tyurina YY, Avrova NF, **Kagan VE**. Gangliosides regulate free-radical reactions in brain membranes. *Bull. Exp. Biol. Med. Rus*. 1992; 114(12):592-594.

183. Tyulina OV, **Kagan VE**, Boldyrev AA. Effects of carnosine and related compounds on oxidative burst in leukocytes activated by barium sulphate. Bull. Exp. Biol. Med. Rus.1994; 116(11):463-465.
184. Kurella AG, **Kagan VE**, Bodyrev AA. Sensitivity of brain and kidney Na/K-ATPase to oxygen free radicals. Neurochemistry (Russia). 1996; 13(4):314-320.

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
2. EOH 2102 Introduction to Research Methods II; Instructor
3. EOH 2306 Biochemical Techniques in Molecular Toxicology; Instructor
4. MSCMP3710 Cancer Biology and Therapeutics (Graduate Pharmacology Course Series); (1 hour)
5. EOH 2175 Principles of Toxicology. (4 hours)
6. EOH 3210 Molecular Fundamentals – (1 hour)
7. MSMBPH 2012 Molecular Biophysics 2: Biomolecular Interactions and Dynamics, Instructor – (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"; 1992 - 1995, 6 papers are published or accepted for publication during this period.

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"; 1993- 1994, second visit 1997-2004; 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 Ca²⁺-transport and Ca²⁺-pump in sarcoplasmic reticulum membranes"; 1993-1994; 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", 1993-1994, second visit 1997-2004; 24 papers published.

Dr. Elizabeth V. Menshikova (on leave from the Helmholtz Research Institute for Eye Diseases, Moscow), Topic: "Characterization of Ca²⁺-transport in pulmonary microsomes and its modification by

oxidative stress"; 1993-1994; 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"; 1994 - 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"; 1994-1996; 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", 1994; 1 paper published.

Dr. Sebastiano Banni (on leave from the University of Cagliari, Italy); Topic "Quantitation of oxidative stress in cells", 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"; 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". 1996; 2 papers published.

Dr. Tatyana V. Sokolova (on leave from Institute of Evolutionary Biochemistry & Physiology, St. Petersburg, Russia); Topic "Phospholipid peroxidation in apoptosis". 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). 1999- 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", 1999- 2005; 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". 1999-2001; 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." 2000-2001; 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" 2000 – 2001, 3 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". 2001 – 2002; 4 papers published.

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

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

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

Dr. Alla Potapovich (On leave from the University of Belarus, Minsk, Belorussia). Topic: "Phosphatidylserine signaling and ROS production by macrophages." 2003 –2005; 3 papers published.

Dr. Natalia Belikova (On leave from Medical University of Russia). Topic: "Mitochondrial targeting of anti-apoptotic radical scavengers." 2004 – 2009. 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." 2004 – 2006; 2 papers published.

Dr. Weihong Feng. Topic: "Lung Oxidative Stress Inflammation of Carbon Nanotubes." 2006 – 2011; 15 papers published.

Dr. Jin Ren. Topic: "Center for Medical Counter Measures Against Radiation." 2006 – 2008; 3 papers published.

Dr. Ruslan Rafikov. Topic: "Cardiolipin Oxidation during Irradiation Apoptosis." 2006 –2008; 2 papers published.

Dr. Zhentai Huang. Topic: "Pulmonary Inflammation/Oxidative Stress by Carbon Nanotubes." 2006 – 2013; 17 papers published.

Dr. Yanamala N. Topic: "Structural studies of proteins with redox functions." 2008-2011; 21 papers published.

Dr. Anna Vikulina. Topic: "Mass spectrometry of cardiolipins and their oxidation products." 2012-2013; 3 papers published.

Dr. Daniel Winnica. Topic: "Oxidative mitochondrial damage." 2012-2013; 3 papers published.

Dr. L.J. Sparvero. Topic: "Mass-spectrometric imaging of lipids." 2008-2009; 9 papers published.

Dr. K.K. Balasubramanian. Topic: "Oxidative signaling by cardiolipins." 2012-2014; 4 papers published.

Dr. R.Rong. Topic: "Imaging mass-spectrometry of lipids in the brain." 2013-2014; 3 papers published.

Dr. Feng Qu. Topic: "Analysis of MS data related to phospholipid peroxidation." 2014-2016.

Dr. Haider Dar. Topic: "Cell death in pathogen-host interactions." 2015-present.

Dr. Gaowei Mao. Topic: "Biomarkers of programmed cell death." 2015-2018.

Dr. Sehwas Jung – Topic: "Assessment of mitochondrial contribution to ferroptosis in cardiomyocytes".

Dr. Vladimirov Georgy – Topic "Peroxidation of phospholipids by the peroxidase complex cyt c/lyso-cardiolipin".

Dr. Wanyang Sun – Topic "Peroxidation of phospholipids by the peroxidase complex cyt c/lyso-

cardiolipin”.

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

Kotelevtsev SV. PhD in biophysics (1975): “EPR studies of NAD(P)H-dependent electron transport in endoplasmic reticulum membranes using stable nitroxide radicals.”

Beriya VP. PhD in biochemistry (1976): “Enzymatic lipid peroxidation as a trigger of disassembly of CYP450 system in endoplasmic reticulum membranes.”

Novikov KN. PhD in biophysics (1977): “Light-induced free radical production in photoreceptor membranes.”

Arkhipenko YuV. PhD in biochemistry (1978): “Modulation of Ca²⁺-transport in sarcoplasmic reticulum membranes by oxidative stress.”

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

Tyurin VA. PhD in biophysics (1980): “Role of lipids in thermal stability of rhodopsin in photoreceptor membranes.”

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

Klaan NK. PhD in biophysics (1981): “Spin-probe ESR study of molecular organization of lipids in membranes”

Sazontova. TG. PhD in biochemistry (1981) “Oxidative modification of Na,K-ATPase in rat myocardial sarcolemma.”

Churakova T.D. PhD in biochemistry (1982): “Role of lipid peroxidation in ischemia damage of skeletal muscles sarcoplasmic reticulum membranes.”

Bratkovskaya L.B. PhD in biophysics (1982): “Oligomerization of intrinsic membrane proteins in the course of lipid peroxidation.”

Serbinova E.A. PhD in biochemistry (1982): “Oxidative stress and proteolytic degradation of cytochrome P-450 in rat liver microsomes.”

Kuliev I.Y. PhD 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. PhD 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. PhD in biophysics (1983): “alpha-Tocopherol as a structural stabilizer of lipid bilayer in membranes.”

Bulgakov V.G. PhD in biophysics (1983): “Ion permeability channels formed by lipid peroxidation products in bilayer lipid membranes.”

Minin AA. PhD in biochemistry (1984): “Reconstitution of hormone-sensitive adenylate cyclase after

solubilization by different detergents.”

Pisarev VA. PhD in Biophysics (1985): “Generation of reactive oxygen species and its regulation regulation in sarcoplasmic reticulum of skeletal and heart muscles.”

Skrypin V.I. PhD in biophysics (1986): “NMR studies of alpha-tocopherol as a modifier of phase transitions in membrane lipid bilayers.”

Bakalova R.A. PhD in biochemistry (1987): “Membrane antioxidant mechanisms of vitamin E homologues differing in the length of their side chain.”

Stoyanovsky D.A. PhD in biochemistry (1988): “Molecular mechanisms of antioxidant interactions of alpha-tocopherol.”

Khurfuf M. PhD in biochemistry (1988): “Antioxidant mechanisms of hindered phenols in biomembranes.”

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

Mr. Radoslav Goldman, PhD student, graduated in 1996. Environ.Occup.Health - 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).

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

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

Mr. Nagarjun Konduru, PhD student – graduated in 2012. Topic “Phospholipid signaling in phagocytosis.” July 2005 present, 6 papers published.

Mr. Dariush Mohammadyani, PhD student, graduated in 2016. Topic ”Structural studies of interactions of lipids with redox-active proteins.” 6 papers published.

Mr. Hsiu Chi Ting, PhD student, 2016 – graduated in 2019. Topic “Role of iron in ferroptotic cell death.”

Mr. Andrew Lamade, PhD student, 2016 – present.

Mr. Michael Facco, PhD student, 2017 - present

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”. 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"; 1998–2000; 3 papers published; graduated in December 2000.

Mr. 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.

Mr. Ji Jing, 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", 1993

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

Ms. Stefania Bergamini (on leave from the University Of Modena, Italy); Topic "Anti-/prooxidant effects of carotenoids in live cells". 1997 - 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", 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"; 1998 –1999, 2 papers published.

Mr. 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." 2000; 1 paper published

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

Ms. Anastasia Polimova (Visiting Pre-Doctoral Fellow from the Russian Federation); "Apoptotic pathways in mitochondria of cells grown in cultures as well as in tissues of animals exposed to hyperoxia or irradiation." 2014 –2015; 2 papers published.

Ms. Anna Vikulina (Visiting Predoctoral Fellow from Moscow State University); "Studies of apoptotic pathways in mitochondria of cells grown in cultures as well as in tissues of animals exposed to hyperoxia or irradiation." 2012 –2013.

Ms. Margarita Artiukhova (Visiting Pre-Doctoral Fellow from the Russian Federation) "Genetic manipulation of lipid peroxidation by regulating expression of iNOS in macrophages", 2020

Ms. Anastasia Levkina (Visiting Pre-Doctoral Fellow from the Russian Federation) "Biochemical assessments of the inhibition of AA-PE peroxidation by NO• donors", 2020

Ms. Liubov Ponomareva (Visiting Pre-Doctoral Fellow from the Russian Federation) "Degradation of GPX4 by P. aeruginosa-derived factors", 2019-2020

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):

Grants:

- 1992-1993 PI, American Cancer Society, Institutional Small Grant.
- 1993-1995 PI, Grant from the American Heart Association, Pennsylvania Affiliate, Recycling of vitamin E and its antioxidant function in the heart.
- 1994-1996 PI, Grant from the American Institute for Cancer Research "Role of dietary anti-oxidants in free radical enhancement of etoposide (VP-16) antitumor activity."
- 1994-1996 PI, Grant from National Science Foundation "Role of coenzyme Q in regenerating vitamin E in electron transport membranes."
- 1994-1997 Co-PI, (Dr. J.C. Yalowich - PI) Grant from American Cancer Society, Free radical activation of VP-16/topoisomerase II interactions."
- 1994-1995 PI, Grant from the US Army Medical Command. Free radical mechanisms of hemorrhagic damage.
- 1994-1995 PI, Grant from the US Army Medical Command. Ca²⁺ transport systems and pulmonary damage by blast overpressure. .
- 1995-1996 PI, Grant from the US Army Medical Command. Antioxidant protection against free radical damage by blast overpressure. .
- 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"
- 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",
- 1996-1998 PI, Grant from the US Army Medical Command. Nitric oxide in free radical protection of the lung.
- 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.
- 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.
- 1997-1997 Co-PI (E. Serbinova - PI) Grant from NIH "Topical Vitamin D Treatment for Skin Disease and Aging"
- 1997-2000 Co-PI, (N. Schor - PI), Grant from DOD "Exploiting bcl-2 Overexpression in the Chemotherapy of Breast Cancer
- 1997-1998 Co-PI, (N.Schor - PI), Grant from NIH (Shannon Award) "Targeted Therapy for Chemoresistant Tumors
- 1998-2002 Co-PI, (N.Schor - PI), Grant from NIH, NCI "Targeted Therapy for Chemoresistant Tumors"
- 1998-1998 Co-PI (J. Fabisiak - PI), Grant from NIH "Endothelial lipid oxidation/translocation by paraquat"
- 1998-1998 Co-Investigator, (B.Day - PI), Grant from NIH, "Oxidative Biomarkers in Asthma".
- 1998-2001 PI, Grant from the American Institute for Cancer Research "Development of Nutritional Antioxidant-based Strategies to Prevent Etoposide-induced Acute Myeloid Leukemia"

- 1998-2003 Co-Investigator, (B.R.Pitt - PI) Grant from NIH “Metallothionein and Reactive Oxygen and Nitrogen Species.
- 1998-1999 Co-Investigator, (C. Hsia - PI) Grant from NIH “PNA, Nitroxide and 6OHDA for Metastatic Neuroblastoma”
- 1998-2001 Co-Investigator (S. Graham - PI) Merit award from VA “The role of inducible cyclooxygenase in delayed neuronal injury”
- 2000-2001 PI, Grant from Research Development Fund, Office of Research, University of Pittsburgh, to support research instrumentation
- 1999-2003 Co-Investigator (S. Graham - PI) Grant from NIH “Cyclooxygenase 2 and ischemic neuronal injury”
- 1999-2002 Co-PI (J. Fabisiak – PI) Grant from EPA “Metal/metal/NO mixtures: metallothioneins and oxidative stress”
- 1999-2000 Co-Investigator (T. Orchard – PI) Epidemiology of Diabetic Complications – Phase II; Grant from NIH.
- 2000-2001 Co-Investigator on Projects 1 and 3 (PI - D. Marion), Molecular Mechanisms in Traumatic Brain Injury: from Bench to Bedside
- 2000-2004 PI, Copper/Albumin Redox-Cycling in Preeclampsia. Grant from NIH HL64145
- 2001-2006 Co-Investigator (PI-J. Greenberger). Gene therapy reduction of radiotherapy esophagitis. Grant from NIH 1RO1 CA 83876-01A2
- 2002-2006 Co-Investigator (PI-J.Siegfried) NIH SPORE grant in Lung Cancer Co-PI (PI-J.Yalowich). Mechanisms and prevention of etoposide-induced leukemia. Grant from NIH NCI. 1RO1 CA 90787-01
- 2002-2007 PI, Pulmonary phosphatidylserine oxidation during apoptosis. Grant from NIH NHLB HL70755
- 2002-2007 Co-Investigator (PI- N. Schor). Antioxidant Strategies for Parkinson's Disease, NIH NCI
- 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.
- 2003-2008 Co-Investigator (PI- N. Schor). Targeted Therapy for Chemoresistant Tumors.NIH NCI
- 2003-2008 Director, Core on Biomarkers of Oxidative Stress, (PI-A. Choi), PPG from NHLB “Hyperoxic Lung Injury”
- 2003-2008 Co-Investigator, (PI- M. Sanders), RO1 from NHLB “OSA and metabolic syndrome: role of oxidative stress”
- 2005-2007 Co-Investigator (PI-M. Fink). Anti-apoptotic strategies against hemorrhagic shock. DARPA, DOD
- 2005-2009 PI: Oxidative lipidomics of cell clearance: from nematodes to humans. Human Frontier Science Program.
- 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
- 2004-2009 Co-Investigator (PI-J. Greenberger). Mn-SOD-PL Irradiation Protection in the Oral Cavity
- 2005-2009 PI, NIOSH, CDC, Lung Oxidative Stress/Inflammation By Carbon Nanotubes.

- 2006-2007 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). PI, NIH/Fogarty International Center, “Cytochrome c Mechanism of ROS signaling in Apoptosis”
- 2006-2011 Co-Investigator, “Novel Nitroxide resuscitation Strategies in Experimental Traumatic Brain Injury,” US Army
- 2007-2012 Co-Investigator, “Regulation of Autophagy in Dopaminergic Cell Death,” NIH
- 2007-2012 Co-Investigator, “Mechanisms and Prevention of Etoposide Induced Leukemia” NIH/NCI
- 2008-2013 PI, “Oxidative Lipidomics of Pulmonary Endothelial Apoptosis in Hyperoxia,” NIH/NHLBI
- 2008-2013 Co-Investigator, “Oxidative Lipidomics in Pediatric Traumatic Brain Injury” NIH/NINDS
- 2008-2013 Co-Investigator, “Mechanisms of Preeclampsia Impact of Obesity” Magee Womens Research Institute and Foundation/NIH
- 2008-2013 Co-Investigator, “TNF-alpha signaling in Silica-Induced Lung Fibrosis” NIH/NIEHS
- 2009-2011 PI, “Irradiation Damage and Protection of Pulmonary Endothelium: Oxidative Lipidomics” NIH
- 2010-2016 PI, “Lung Oxidative Stress/Inflammation by Carbon Nanotubes” NIH/NIOSH
- 2010-2019 PI, Project 2, “Mitochondrial Targeting Against Radiation Damage” NIH/NIAID
- 2010-2015 PI, “Carbon Nanotubes Biodegradation by Neutrophil Myeloperoxidase” CDC/NIOSH
- 2010-2015 Co-PI, “Investigation and Mitigation of Carbon Nanomaterial Toxicity” NIH/NIEHS
- 2011-2017 Co-PI, “Oxygenated Species of Cardiolipin’s as Biomarkers of Mitochondrial Dysfunction” NIH/NIEHS
- 2012-2014 Co-PI, “Imaging Mass Spectrometry for Oxidized Lipidomics in Acute Lung Injury”
- 2012-2017 Co-PI, “Mapping Lipid Oxidation in Traumatic Brain Injury by Mass Spectrometric Imaging” NIH
- 2012-2017 Co-PI, “Lipids and Myeloid Cell Function in Cancer” H. NIH/NCI
- 2014-2017 PI of Lipidomics Project. “Oxidative Lipidome: The Unspoken Language of Non-Apoptotic Cell Death. Human Frontier Science Program.
- 2014-2018 Co-PI, “Cardiolipin as a Novel Mediator of Acute Lung Injury” NIH
- 2014-2019 PI, Project #2, “Cardiolipin Signaling in Acute lung Injury.” NIH/NHLBI
- 2014-2019 Co-PI- “Oxidative Lipidomics in Pediatric Traumatic Brain Injury” NIH/NIND
- 2014-2019 Director, Lipidomics Core, “Cardiolipin in Acute Lung Injury.” NIH/NHLBI
- 2015-2018 PI, Cardiolipin Oxidation in Barth Syndrome
- 2015-2018 PI, “Mechanisms and Role of Cardiolipin Oxidation and Hydrolysis in Barth Syndrome”
- 2015-2020 Co-PI, “Mechanism-Directed Sequential Delivery of Radiation Mitigators, Project 2, Targeting of New Derived Lipid Mediators Pathways for Radiomitigation, Cardiolipin-Coordinating Center Care
- 2020-2021 Co-PI, Pitt Momentum Funds, “Deciphering Redox Free Radical Mechanisms of 15LOX/PEB1 - Driven Ferrotoxisis in Skin”

- 2019-2024 PI, “Ferroptosis as a Death mechanism in Lund Injury (Project 2)”
- 2018-2021 PI, “The molecular basis of cardiolipin-protein interactions implicated in intrinsic apoptosis”
- 2018-2023 Co-PI, “Lipids and Myeloid Cell Function in Cancer”
- 2018-2023 Co-PI, “Lipid imaging in Traumatic Brain Injury by high resolution GCIB-secondary ion mass spectrometry”
- 2020-2025 Co-I, “Druggable Mitochondrial Targets for Treatment of Cerebral Ischemia”
- 2020-2025 Co-PI, “Protein-Oxidized Phospholipid Interactions Determine Epithelial Cell Fate and Asthma Control”

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".
- 1994-1996 PI, Contract from Magee-Womens Research Institute, "Plasma antioxidant reserves in pregnant women with preeclampsia".
- 1995-1996 PI, Contract from Safar International Center for Resuscitation Research (the University of Pittsburgh) "Brain antioxidants after cardiac arrest".
- 1998-1999 PI, Contract from Safar International Center for Resuscitation Research (the University of Pittsburgh) "Uncontrolled hemorrhagic shock in rats".
- 2000-2001 PI, Contract from Bertek Pharmaceuticals, Inc (Foster City, CA) “Effects of Butenafine on peroxisomal enzymatic activities in rat and human hepatocytes”.
- 2000-2002 PI, Contract from Safar International Center for Resuscitation Research (University of Pittsburgh) "Uncontrolled hemorrhagic shock in rats”.
- 2011-2014 PI, Contract from Glaxo Klein Smith.

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).
- 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).
- 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).
- 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 coke-oven operators of Novokuznetsk Steel Combine", (together with Dr. R. Day, Department of Biostatistics, GSPH).
- 1994-1995 Grant from The Society of Toxicology Graduate Fellowship Award (sponsored by Hoffmann-La Roche);
- 1994-1995 Grant from The Allegheny-Erie Chapter of Society of Toxicology Graduate Fellowship Award for Rado Goldman.
- 1995-1996 Grant from EPA (Graduate Fellowship Award) 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).
- 1997-2002 Principal Trainer, (M. Pinsky - PI), NIH, Institutional National Research Service Award for Institutional Research Training Grant.
- 1998-2000 International Fellowship award from NIH/WHO to support postdoctoral fellow Yulia Tyurina (Russia).
- 1999-2000 Magee-Womens Research Institute Fellowship award to support postdoctoral training of Dr. Vladimir Tyurin
- 2000-2001 Seed grant from the Department of Anesthesiology and Critical Care Medicine, University of 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).
- 2006 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

SERVICE

ADMINISTRATIVE

Department

Vice-Chairman, Department of Environmental and Occupational Health, University of Pittsburgh

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, Department of Environmental and Occupational Health, Major Equipment Committee

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

SCIENTIFIC

Editorial Boards of Journals:

Antioxidant and Redox Signaling – Executive Editor
Chemistry and Physics of Lipids – Associate Editor
Free Radical Biology and Medicine
Biochimica et Biophysica Acta - Biomembranes
Nanomedicine, Nanotechnology, Biology and Medicine

Reviewer of Grant Proposals for:

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