

**BIOGRAPHICAL SKETCH**

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NAME Ding Xue	POSITION TITLE		
eRA COMMONS USER NAME Ding_Xue	Professor		
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Univ. of Science and Technology (Hefei, China)	B.S.	1986	Cell Biol./Neurobiology
Univ. of Connecticut Med. School (Farmington, CT)		1989	Biochemistry
Columbia University (New York, NY)	Ph.D.	1993	Developmental Genetics
MIT (Boston, MA)	Postdoc.	1994-1997	Developmental Genetics

**A. Positions and Honors.** List in chronological order previous positions, concluding with your present position. List any honors. Include present membership on any Federal Government public advisory committee.

**Positions and Employments**

1988.3-1989.6	<b>Ph.D. Candidate</b> , Department of Molecular Biology and Biochemistry, University of Connecticut Medical School, Farmington, Connecticut.
1989.9-1993.12	<b>Ph.D. Candidate</b> , Department of Biological Sciences, Columbia University, New York, New York. At the laboratory of Dr. Martin Chalfie. Ph.D. thesis: The regulation and function of the <i>mec-3</i> gene in the differentiation of the <i>Caenorhabditis elegans</i> touch receptor neurons.
1994.1-1997.10	<b>Postdoctoral Fellow</b> , Department of Biology, MIT, Boston, Massachusetts. At the laboratory of Dr. Robert H. Horvitz.
1997.11-2003.5	<b>Assistant Professor</b> , Department of Molecular, Cellular, and Developmental Biology, University of Colorado, Boulder, Colorado.
2003.6-2007.4	<b>Associate Professor</b> , Department of Molecular, Cellular, and Developmental Biology, University of Colorado, Boulder, Colorado.
2006.9-2022.3	<b>Adjunct Visiting Professor</b> , Tsinghua University, P.R. China.
2008.9-2014.8	<b>Foreign Adjunct Professor</b> , Karolinska Institutet, Sweden.
2007.5-present	<b>Professor</b> , Department of Molecular, Cellular, and Developmental Biology, University of Colorado, Boulder, Colorado.

**Other Experiences and Professional Memberships**

1999-present	Grant reviewer for NIH, US National Science Foundation, American Cancer Society, United States-Israel Binational Science Foundation, and Chinese National Science Foundation.
1997-present	Reviewer for more than 47 Journals (Cell, Nature, Science, Molecular Cell, Developmental Cell, Nature Cell Biology, eLife, Nature Reviews Mol. Cell Biology, Journal of Cell Biology, Development, Genetics, PNAS, Oncogene, Cancer Research, Biotechnology, Cell Death and Differentiation, MBC, Biotechniques, BBA, Mechanisms of Development and others).
2003	Member of the organizing committee of 14 <sup>th</sup> International <i>C. elegans</i> meeting
2003	Co-chair of the Gordon Research Conference on "Clearance of Dying Cells By Phagocytes: Mechanisms and Consequences".
2003	Keystone Symposia Scientific Advisory Board, Ad Hoc Member
2003-2008	Member of Faculty of 1000.
2006-2009	Board of Directors of the Chinese Biology Investigator Society (CBIS).
2013	Scientific Advisory Board in the Infectious Disease Area in Roche Pharmaceuticals

**Honors**

1992-1993	Peter Sajovic Memorial Prize for Outstanding Work in Biology (Columbia University).
1994	Anna Fuller Fund Postdoctoral Fellowship.
1995-1998	Helen Hay Whitney Foundation Postdoctoral Fellowship.
1996-2001	Burroughs Wellcome Fund Career Award in the Biomedical Sciences
1999-2002	Searle Scholar Award
1999	Junior Faculty Development Award (University of Colorado)
2001-2004	Department of Defense Army Breast Cancer Program Idea Award
2002	New Inventor of the year (University of Colorado)
2005-2008	Human Frontier Science Program (HFSP) Program Grant Award
2006-2009	American Asthma Foundation Early Excellence Award
2011, 2020	College of Arts and Sciences Scholar Award (University of Colorado)
2016-present	R35 Maximizing Investigators' Research Award, National Institute of General Medical Sciences
2022	Gerber Memorial Lecture from the Tulane University

**Patents:**

1. Jay Parrish and Ding Xue, US patent 7368237 B2 (Approved on May 6, 2008). Entitled "Cell Death-Related Nucleases and Their Uses".
2. Xin Geng and Ding Xue, US patent 9518090 (Approved 12/13/2016). Entitled "COMPOSITIONS AND METHODS FOR TREATING HEPATITIS B."
3. Ding Xue and Xin Geng, US Patent 10155020 B2 (Approved 12/18/2018). Entitled "COMPOSITIONS AND METHODS FOR TREATING HEPATITIS B."
4. Ding Xue, Yu Peng et al., a PCT Application PCT/US2018/042569 (Approved September 27, 2022). Entitled "Compositions and Methods for Preventing and Alleviating Side Effects Caused by Radiation or Radiotherapy".
5. Xiaoyun Ding, Ding Xue, Nakul Sridhar and Joyita Bhadra. US Patent Application US 17/807,849 "Gym on a chip for small animal exercise" (Filed on June 20, 2022)
6. Ding Xue, Yu Peng et al., US Pat App No 17/852,475; Title: Compositions And Methods For Preventing And Treating Radiation-Induced Bystander Effects Caused By Radiation Or Radiotherapy" (Filed on June 28, 2022)
7. Ding Xue and Hu Zhang, US Provisional Patent Application No. 63/468,692. Entitled "Compositions and Methods for Preventing and Alleviating mitochondrial diseases" (Filed on 5/24/2023).

**B. Selected peer-reviewed publications (in chronological order).** Do not include publications submitted or in preparation.

1. Xue, D., Finney, M., Ruvkun, G., and Chalfie, M. (1992) Regulation of the *mec-3* gene by the *C. elegans* homeoproteins UNC-86 and MEC-3. **EMBO. J.** 11: 4969-4979.
2. Xue, D., Tu, Y., and Chalfie, M. (1993) Cooperative interaction between the *C. elegans* homeoproteins UNC-86 and MEC-3. **Science** 261: 1324-1328.
3. Xue, D., and Horvitz, H. R. (1995). Inhibition of the *Caenorhabditis elegans* cell-death protease CED-3 by a CED-3 cleavage site in baculovirus p35 protein. **Nature** 377: 248-251.
4. Xue, D., Shaham, S., and Horvitz, H. R. (1996). The *C. elegans* cell-death protein CED-3 is a cysteine protease with substrate specificities similar to those of the human CPP32 protease. **Genes & Development** 10: 1073-1083.
5. Xue, D., and Horvitz, H. R. (1997). *C. elegans* CED-9 protein, a bifunctional cell-death inhibitor. **Nature** 390: 305-308.
6. Barkert, M., Xue, D., Horvitz, H.R. and Gilmore, T. D. (1997). Phosphorylation of I $\kappa$ B- $\alpha$  inhibits its cleavage by Caspase CPP32 *in vitro*. **J. Biol. Chem.** 272: 29419-29422.
7. Ledwich, D., Wu, Y.C., Driscoll, M, and Xue, D. (2000). Analysis of programmed cell death in the nematode *C. elegans*. **Methods in Enzymology** 322: 76-88.
8. Parrish, J., Metters, H., Chen, L., and Xue, D. (2000). Demonstration of in vivo interaction of key cell death regulators by structure-base design of second-site suppressor mutations. **Proc. Natl. Acad. Sci. USA** 97:11916-11921.
9. Parrish, J., Li, L., Klotz, K., Ledwich, D., Wang, X.D., and Xue, D. (2001). Mitochondrial endonuclease G is important for apoptosis in *C. elegans*. **Nature** 412, 90-94.

10. Fadok V.A., Xue D., and Henson P.M. 2001. If phosphatidylserine is the death knell, a new phosphatidylserine-specific receptor is the bellringer. **Cell Death Differentiation** 8:582-587.
11. Xue, D., Wu, Y.C., and Shah, M.M. (2001). Programmed cell death in *C. elegans* -- a genetic framework. Chapter II in "Apoptosis: The Molecular Biology of Programmed Cell Death". Page 23-55. Edited by M. Jacobson & N. McCarthy. **Oxford University Press**.
12. Wang, X.C., Yang, C.L., Cai, J.J., Shi, Y.G., and Xue, D. (2002). Mechanisms of AIF-mediated apoptotic DNA degradation in *Caenorhabditis elegans*. **Science** 298, 1587-1592. (Research Article).
13. Parrish, J. and Xue, D. (2003). Functional genomic analysis of apoptotic DNA degradation in *C. elegans*. **Molecular Cell** 11, 987-996.
14. Wu, Y.C. and Xue, D. (2003). Programmed cell death in *C. elegans*. Chapter IV in "Essentials of Apoptosis: A Guide for Basic and Clinical Research". Page 135-144. Edited by X.M. Yin & Z. Dong. **The Humana Press Inc.**
15. Parrish, J., Yang, C.L., Shen, B.H., and Xue, D. (2003). CRN-1, a *Caenorhabditis elegans* FEN-1 homologue, cooperates with CPS-6/EndoG to promote apoptotic DNA degradation. **EMBO. J.** 22, 3451-3460.
16. Wang, X.C, Wu, Y.C, Fadok, V., Lee, M.C., Gengyo-Ando, K., Cheng, L.C., Ledwich, D., Hsu, P.K., Chen, J.Y., Chou, B.K., Henson, P., Mitani, S., and Xue, D. (2003). Cell Corpse Engulfment Mediated by *C. elegans* Phosphatidylserine Receptor Through CED-5 and CED-12. **Science** 302, 1563-1566.
17. Friedman, J. and Xue, D. (2004). To live or die by the sword: the regulation of apoptosis by the proteasome. **Developmental Cell** 6, 460-461.
18. Kim, S., Valencia, M., Lee, E., Park, D., Oh, M., Xue, D., Park, W. (2004). Identification of CED-3 Substrates by a Yeast-Based Screening Method. **Mol. Biotechnology** 27, 1-6.
19. Yang, N, Gu, L.C., Kokel, D., Han, A.D., Chen, L., Xue, D., and Shi, Y.G. (2004). Structural, Biochemical and Functional Analyses of CED-9 Recognition by the Pro-apoptotic Proteins EGL-1 and CED-4. **Mol. Cell** 15, 999-1006.
20. Breckenridge, D. and Xue, D. (2004). Regulation of mitochondrial membrane permeabilization by BCL-2 family proteins and caspases. **Curr. Opin. Cell Biol.** 16, 647-652.
21. Zheng, L., Zhou, M., Chai, Q., Parrish, J., Xue, D., Patrick, S.M., Turchi, J.J., Yannone, S.M., Chen, D., and Shen, B. (2005). Novel function of the flap endonuclease 1 complex in processing stalled DNA replication forks. **EMBO Report** 6, 83-89.
22. Conradt, B. and Xue, D. (2005). Programmed cell death. **WormBook**, ed. the *C. elegans* Research Community, 1895-1908.
23. Yan, N., Chai, J.J., Lee, E.S., Gu, L.C., Liu, Q., He, J.Q., Wu, J.W., Li, H.L., Hao, Q., Xue, D., and Shi, Y.G. (2005). Structure of the CED-4/CED-9 complex reveals insights into programmed cell death in *Caenorhabditis elegans*. **Nature** 437, 831-837. (Article)
24. Fadeel, B. and Xue, D. (2005). PS externalization: from corpse clearance to drug delivery. **Cell Death Differentiation** 13: 360-362.
25. Parrish, J., and Xue, D. (2006). Cuts can kill: the roles of apoptotic nucleases in cell death and animal development. **Chromosoma** 115: 89-97.
26. Yang, C.L., Yan, N., Parrish, J., Wang, X.C., Shi, Y.G., and Xue, D. (2006). RNA aptamers targeting the cell death inhibitor CED-9 induce cell killing in *C. elegans*. **J. Biol. Chem.** 281:9137-9144.
27. Kokel, D., Li, Y.H., Qin, J., and Xue, D. (2006). The non-genotoxic carcinogens naphthalene and para-dichlorobenzene suppress apoptosis in *C. elegans*. **Nature Chemical Biology** 2: 338-345. (Article)
28. Kokel, D. and Xue, D. (2006). A class of benzenoid chemicals suppresses apoptosis in *C. elegans*. **ChemBioChem** 7: 2010-2015.
29. Wang, X.C., Wang, J., Gengyo-Ando, K., Gu, L.C., Sun, C.L., Yang, C.L., Shi, Y., Shi, Y.G., Mitani, S., Xie, X.S., and Xue, D. (2007). *C. elegans* phospholipid scramblase SCR-1 is important for phosphatidylserine externalization during apoptosis. **Nature Cell Biology** 9, 541-549.
30. Peden, E., Kimberly, E.L., Gengyo-Ando, K., Mitani, S., and Xue, D. (2007). Control of sex-specific apoptosis in *C. elegans* by the BarH homeodomain protein CEH-30 and the transcriptional repressor UNC-37/Groucho. **Genes & Development** 21, 2195-3207.
31. Darland-Ransom, M., Wang, X.C., Sun, C.L., Mapes, J., Gengyo-Ando, K., Mitani, S. and Xue, D. (2008). Role of the *C. elegans* TAT-1 protein in maintaining plasma membrane phosphatidylserine asymmetry. **Science**, 528-531.

32. Peden, E., Killian, D., and Xue, D. (2008). Cell death specification in *C. elegans*. **Cell Cycle** 7, 2479-2484.
33. Breckenridge, D., Kang, B.H., Kokel, D., Mitani, S., Staehelin, A.L., and Xue, D. (2008). *Caenorhabditis elegans* *drp-1* and *fis-2* regulate distinct cell death execution pathways downstream of *ced-3* and independent of *ced-9*. **Molecular Cell** 31, 586-597.
34. Killian, D., Harvey, E., Johnson, P., Otori, M., Mitani, S., and Xue, D. (2008). SKR-1, a homolog of Skp1 and a member of the SCF<sup>SEL-10</sup> complex, regulates sex-determination and LIN-12/Notch signaling in *C. elegans*. **Developmental Biology** 322, 322-331.
35. Geng, X., Shi, Y., Nakagawa, A., Yoshina, S., Mitani, S., Shi, Y., and Xue, D. (2008). Inhibition of CED-3 zymogen activation and apoptosis in *Caenorhabditis elegans* by a caspase homolog CSP-3. **Nature Structural & Molecular Biology** 15, 1094-1101.
36. Hsiao, Y.Y., Nakagawa, A., Shi, Z., Mitani, S., Xue, D. and Yuan, H. S. (2009). Crystal structure of CRN-4: implications for domain function in apoptotic DNA degradation. **Mol. Cell. Biol.** 29, 448-457.
37. Breckenridge, D., Kang, B.H., and Xue, D. (2009). Bcl-2 proteins EGL-1 and CED-9 do not regulate mitochondrial fission or fusion in *Caenorhabditis elegans*. **Current Biology** 19, 768-773.
38. Geng, X., Zhou, Q.H., Kage-Nakadai, E., Shi, Y., Yan, N., Mitani, S., and Xue, D. (2009). *Caenorhabditis elegans* caspase homolog CSP-2 inhibits CED-3 autoactivation and apoptosis in germ cells. **Cell Death & Differentiation** 16, 1385-1394.
39. Fadeel, B. and Xue, D. (2009). The ins and outs of phospholipid asymmetry in the plasma membrane: roles in health and disease. **Critical Reviews In Biochemistry & Molecular Biology** 44: 264-277.
40. Lai, H.J., Lo, S.Z., Kage-Nakadai, E., Mitani, S., and Xue, D. (2009). The roles and acting mechanism of *Caenorhabditis elegans* DNase II genes in apoptotic DNA degradation and development. **PLoS One** 4, e7348.
41. Nakagawa, A.\*, Shi, Y.\*, Kage-Nakadai, E., Mitani, S., and Xue, D. (2010). Caspase-Dependent Conversion of Dicer Ribonuclease into a Death-Promoting Deoxyribonuclease. **Science** 328, 327-334. (Research Article featured on the cover of **Science**). \* These authors contribute equally to the work.
42. Wang, X.C., Li W., Zhao, D.F., Liu, B., Shi, Y., Chen, B.H., Yang, H.W., Guo, P.F., Geng, X., Shang, Z.H., Peden, E., Kage-Nakadai, E., Mitani, S., and Xue, D. (2010). *C. elegans* transthyretin-like protein TTR-52 mediates recognition of apoptotic cells by the CED-1 phagocyte receptor. **Nature Cell Biology** 12, 655-664.
43. Mapes, J., Chen, J.T., Yu, J.S., and Xue, D. (2010). Somatic sex determination in *C. elegans* is modulated by SUP-26 repression of *tra-2* translation. **Proc. Natl. Acad. Sci. USA** 107:18022-18027.
44. Harry, B., Nakagawa, A., and Xue, D. (2010). Dicing Up Chromosomes: the Unexpected Role of Dicer in Apoptosis. **Cell Cycle** 9, 4772 – 4773.
45. Harry, B. and Xue, D. (2011). *C. elegans* and Apoptosis. Chapter 34 in "Apoptosis: Physiology and Pathology". Pages 397-406. Edited by D.R. Green & J.C. Reed. **Cambridge University Press**.
46. Zhou, Q.H., Li, H.M., and Xue, D. (2011). Elimination of Paternal mitochondria through the lysosomal degradation pathway in *C. elegans*. **Cell Research** 21, 1662-1669.
47. Lin, J.L., Nakagawa, A., Lin, C.L., Hsiao, Y.Y., Yang, W.Z., Wang, Y.T., Doudeva, L.G., Skeen-Gaar, R.R., Xue, D., and Yuan, H.S. (2012). Structural insights into apoptotic DNA degradation by CED-3 Protease Suppressor-6 (CPS-6) from *Caenorhabditis elegans*. **Journal of Biological Chemistry** 287, 7110-7120.
48. Wu, Y.C., Wang, X.C., and Xue, D. (2012). Methods for Studying Programmed Cell Death in *C. elegans*. **Methods Cell Biology** 107, 295-320.
49. Mapes, J., Chen, Y.Z., Kim, A., Mitani, S., Kang, B.H., and Xue, D. (2012). CED-1, CED-7, and TTR-52 act in a pathway to regulate exoplasmic phosphatidylserine expression on apoptotic and phagocytic cells. **Current Biology** 22, 1267-1275.
50. Morton, LA, Yang H, Saludes JP, Fiorini Z, Beninson L, Chapman ER, Fleshner M, Xue D, and Yin H (2012). MARCKS-ED Peptide as a Curvature and Lipid Sensor. **ACS Chemical Biology** 8: 218-225.
51. Geng, X., Harry, B.L., Zhou, Q.H., Skeen-Gaar, R.B., Ge, X., Lee, E.S., Mitani, S., and Xue, D. (2012). Hepatitis B Virus X protein targets the Bcl-2 protein CED-9 to induce intracellular Ca<sup>2+</sup> increase and cell death in *C. elegans*. **Proc. Natl. Acad. Sci. USA** 109: 18465-18470.

52. Geng, X., Huang, C.H., Qin, Y., McComb, J., Yuan, Q., Harry, B.L., Palmer, A., Xia, N.S., and Xue, D. (2012). Hepatitis B virus X protein targets Bcl-2 proteins to increase cytosolic Ca<sup>2+</sup>, required for virus replication and cell death induction. **Proc. Natl. Acad. Sci. USA** 109: 18471-18476.
53. Chen, Y.Z., Mapes, J., Lee, E.S. and Xue, D. (2013). Caspase-mediated activation of *Caenorhabditis elegans* CED-8 promotes apoptosis and PS externalization. **Nature Communications** 4: 2726 doi: 10.1038/ncomms3726.
54. Lee, E.S. and Xue, D. (2014). Caspase Protocols in *C. elegans*. **Methods in Molecular Biology** 1133:101-108. doi: 10.1007/978-1-4939-0357-3\_6.
55. Ge, X., Zhao, X., Nakagawa, A., Gong, X., Skeen-Gaar, R., Shi, Y., Gong, H.P., Wang, X.Q., and Xue, D. (2014). A novel mechanism underlies caspase-dependent conversion of the dicer ribonuclease into a deoxyribonuclease during apoptosis. **Cell Research** 24: 218-232.
56. Zhao, P., Zhang, Z., Ke, H.M., Ye, Y.R. and Xue, D. (2014). Oligonucleotide-based targeted gene editing in *C. elegans* via the CRISPR/Cas9 system. **Cell Research** 24: 247-250.
57. Nakagawa, A., Sullivan, K., and Xue, D. (2014). Caspase-activated phosphoinositide binding by CNT-1 promotes apoptosis by inhibiting the AKT pathway. **Nature Structural & Molecular Biology** 21, 1082-1090.
58. Weaver, B.P., Zabinsky, R., Weaver, Y.M., Lee, E.S., Xue, D., and Han, M. (2014). CED-3 caspase acts with miRNAs to regulate non-apoptotic gene expression dynamics for robust development in *C. elegans*. **eLife** doi: 10.7554/eLife.04265.
59. Yang, H.W.\* , Chen, Y.Z\* , Zhang, Y.\* , Wang, X.H., Zhao, X., Godfroy, J.I., Liang, L., Zhang, M., Zhang, T.Y., Yuan, Q., Royal, M.A., Driscoll, M.D., Xia, N.S., Yin, H., and Xue, D. (2015). A lysine-rich motif in the phosphatidylserine receptor PSR-1 mediates recognition and removal of apoptotic cells. **Nature Communications** 6: 5717 doi: 10.1038/ncomms6717. \*Equal contribution.
60. Neumann, B., Coakley, S., Giordano-Santini, R., Linton, C., Lee, E.S., Nakagawa, A., Xue, D., and Hilliard, M.A. (2015). EFF-1-mediated regenerative axonal fusion requires components of the apoptotic pathway. **Nature** 517, 219–222.
61. Sullivan, K.\* , Nakagawa, A.\* , Xue, D.# , and Espinosa, J.M.# (2015). Human ACAP2 is a homolog of *C. elegans* CNT-1 that promotes apoptosis in cancer cells. **Cell Cycle** 14, 1771-1778. \*Equal contribution. #Co-corresponding authors.
62. Seervi, M. and Xue, D. (2015). Mitochondrial cell death pathways in *Caenorhabditis elegans*. **Current Topics in Developmental Biology** 114, 43-65.
63. Nichols, A.A, Meelkop, E., Linton, C., Giordano-Santini, R., Sullivan, R., Donato, A., Nolan, C., Hall, D.H., Xue, D., Neumann, B., and Hilliard, M. (2016). The Apoptotic Engulfment Machinery Regulates Axonal Degeneration in *C. elegans* Neurons. **Cell Reports** 14, 1673-1683.
64. Zhao, P., Zhang, Z., Lv, X.Y., Zhao, X., Suehiro, Y., Jiang, Y.N., Wang, X.Q., Mitani, S., Gong, H.P., and Xue, D. (2016). One-step homozygosity in precise gene editing by an improved CRISPR/Cas9 system. **Cell Research** 26, 633-636.
65. Conradt, B., Wu, Y.C., and Xue, D. (2016). Programmed Cell Death During *C. elegans* development. **Genetics** 203:1533-1562.
66. Lin, J.L.\* , Nakagawa, A.\* , Skeen-Gaar, R.R., Yang, W.Z., Zhao, P., Zhang, Z., Ge, X., Mitani, S., Xue, D.# , and Yuan, H.S.# (2016). Oxidative Stress Impairs Cell Death by Repressing the Nuclease Activity of Mitochondrial Endonuclease G. **Cell Reports** 16, 279–287. \*Equal contribution. #Co-corresponding authors.
67. Zhou, Q.H.\* , Li, H.M.\* , Li, H.Z.\* , Nakagawa, A., Harry, B., Lee, E.S., Lin, J., William, D., Mitani, S., Yuan, H., Kang, B.H.# , and Xue, D.# (2016). Mitochondrial endonuclease G mediates breakdown of paternal mitochondria following fertilization. **Science** 353, 394-399. \*Equal contribution. #Co-corresponding authors.
68. Wang, Y.\* , Zhang, Y.\* , Chen, L.W., Liang, Q., Yin, X.M., Miao, L., Kang, B.H.# , and Xue, D.# (2016). Kinetics and specificity of paternal mitochondrial elimination in *Caenorhabditis elegans*. **Nature Communications** 7, 12569. DOI: 10.1038/ncomms12569. \*Equal contribution. #Co-corresponding authors.
69. Chen, X.D.\* , Wang, Y.\* , Chen, Y.Z.\* , Harry, Brian, L.H., Nakagawa, A., Lee, E.S., Guo, H.Y., and Xue, D. (2016). Regulation of CED-3 caspase localization and activation by *C. elegans* nuclear membrane protein NPP-14. **Nature Structural & Molecular Biology** 23, 958-964. \*Equal contribution.

70. Smith, C.E., Soti, S., Jones, T.A., Nakagawa, A., Xue, D., and Yin, H. (2017). Non-steroidal Anti-inflammatory Drugs Are Caspase Inhibitors. **Cell Chem. Biol.** 24:281-292.
71. Klöditz, K., Chen, Y.Z., Xue, D., and Fadeel, B. (2017). Programmed cell clearance: From nematodes to humans. **Biochemical and Biophysical Research Communications** 482: 491-497.
72. Peng, Y.\* , Zhang, M.\* , Zheng, L.J.\* , Liang, Q.\* , Li, H.Z\*., Chen, J.T., Guo, H., Yoshina, S. Chen, Y.Z., Zhao, X., Wu, X.Q., Liu, B., Mitani, S., Yu, J.S., and Xue, D. (2017). Cysteine protease cathepsin B mediates radiation-induced bystander effects. **Nature** 547, 458-462. \*Equal contribution
73. Chen, Y.Z.\* , Kloditz, K.\* , Lee, E.S., Nguyen, D.P., Yuan, Q., Johnson, J., Lee-yow, Y., Hall, A., Mitani, S., Xia, N.S., Fadeel, B., and Xue, D. (2019). Structure and function analysis of the *C. elegans* aminophospholipid translocase TAT-1. **Journal of Cell Science** advanced online publication. \*Equal contribution.
74. Zhang, T.Y.\* , Chen, H.Y.\* , Cao, J.L.\* , Xiong, H.L., Mo, X.B., Li, T.L., KANG, X.Z., Zhao, J.H., Yin, B., Zhao, X., Huang, C.H., Yuan, Q.# , Xue, D.# , Xia, N.S.# , and Yuan, Y.A. (2019). Structural and functional analyses of Hepatitis B virus X protein BH3-like domain and Bcl-xL interaction. **Nature Communications** 10: 3192. \*Equal contribution. #Co-corresponding authors
75. Zheng, L.J., Wu, X.Q., Li, S.S., Liu, B., and Xue, D. (2019). Cathepsin B inhibitors block multiple radiation-induced side effects in *C. elegans*. **Cell Research** 29, 1042-1045.
76. Bhadra, J.\* , Sridhar, N.\* , Fajrial, A.K., Hammond, N., Xue, D.# , and Ding, X.Y.# (2023). Acoustic Streaming Enabled Moderate Swimming Exercise Reduces Neurodegeneration in *C. elegans*. **Science Advances** 9, eadf5056. \*Co-first authors, #Co-corresponding authors.
77. Zhang, H., Zhu, Y., Suehiro, Y., Mitani, S., and Xue, D. (2023). AMPK-FOXO-IP3R signaling pathway mediates neurological and developmental defects caused by mitochondrial DNA mutations. **Proc. Natl. Acad. Sci. USA** 120: e2302490120.

**C. Research Support.** List selected ongoing or completed (during the last three years) research projects (federal and non-federal support). Begin with the projects that are most relevant to the research proposed in this application. Briefly indicate the overall goals of the projects and your role (e.g. PI, Co-Investigator, Consultant) in the research project. Do not list award amounts or percent effort in projects.

### Ongoing Research Support

#### ONGOING

**R35 GM118188-08**

06/01/16-05/31/26

Xue (PI)

NIH

Fundamental mechanisms of paternal mitochondrial elimination and radiation-induced bystander effects

The major goals of this project are to understand the fundamental mechanisms of two important biological processes, paternal mitochondrial elimination and radiation-induced bystander effects.

**R35 GM118188-03S1**

06/01/18-05/31/26

Xue (PI)

NIH

Fundamental mechanisms of paternal mitochondrial elimination and radiation-induced bystander effects

This is an administrative equipment supplemental award.

**R35 GM118188-04S1**

06/01/19-05/31/26

Xue (PI)  
NIH

Fundamental mechanisms of paternal mitochondrial  
elimination and radiation-induced bystander effects

This is an administrative equipment supplemental award.

**R35 GM118188-07S1**

06/01/22-05/31/26

Xue (PI)  
NIH

Fundamental mechanisms of paternal mitochondrial  
elimination and radiation-induced bystander effects

This is an administrative equipment supplemental award.

**R35 GM118188-08S1**

08/01/23-05/31/26

Xue (PI)  
NIH

Fundamental mechanisms of paternal mitochondrial  
elimination and radiation-induced bystander effects

This is an administrative equipment supplemental award.