Stanford



Edward Graves

Professor of Radiation Oncology (Radiation Physics), and by courtesy, of Radiology

Radiation Oncology - Radiation Physics

NIH Biosketch available Online Curriculum Vitae available Online

CONTACT INFORMATION

- **Administrative Contact**

  Micah Kelly - Administrative Associate 3

  Email mkelly3@stanford.edu

  Tel 6507364757

Bio

ACADEMIC APPOINTMENTS

- Professor, Radiation Oncology - Radiation Physics
- Professor (By courtesy), Radiology - Rad/Molecular Imaging Program at Stanford
- Member, Bio-X
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Stanford Cancer Institute

ADMINISTRATIVE APPOINTMENTS

- Program Director, Biomedical Physics PhD program, (2022- present)

PROFESSIONAL EDUCATION

- B.S., UC Berkeley , Bioengineering (1996)
- Ph.D., UC Berkeley/UCSF , Bioengineering (2001)

LINKS

- Graves Lab: http://graveslab.stanford.edu

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

My research group is broadly focused on applications of emerging functional and molecular imaging techniques in radiation therapy of cancer. I trained as a bioengineer and am equally committed to engineering of novel methods for biomedical research and their application in order to understand radiation biology. My research group has pioneered novel methods for clinically-relevant, image-guided, conformal radiation treatment of small animal models of disease. This includes development of irradiator systems as well as software for image analysis and radiation treatment planning. Furthermore, we have integrated these methods with techniques for preclinical molecular imaging including magnetic resonance imaging, positron emission tomography, and bioluminescence imaging, to allow consideration of these modalities in radiotherapy planning and to assess response to

treatment. Using these technologies, we study how tumors and normal tissues respond to radiotherapy and how we may combined this standard-of-care cancer treatment with molecularly targeted treatments in order to maximize tumor response. Of particular interest are the effects of radiation that can affect cells and tissues outside the volume that was irradiated. This includes release of damage signals, cytokines, and chemokines that can alter tumor and stromal cell behavior both locally and distantly. We study basic radiation biology with an eye towards identifying novel strategies for radiotherapy and for combination with other treatments in clinical trials.

CLINICAL TRIALS

- Imaging and Biomarkers of Hypoxia in Solid Tumors, Not Recruiting

Teaching

COURSES

2026-27

- Biological Principles and Medical Applications of Ionizing Radiation: BMP 253, RADO 253 (Spr)

2025-26

- Biological Principles and Medical Applications of Ionizing Radiation: BMP 253, RADO 253 (Spr)

2024-25

- Biological Principles and Medical Applications of Ionizing Radiation: BMP 253, RADO 253 (Spr)
- Program in Radiation Biology Seminar Series: RADO 244 (Aut, Win, Spr, Sum)

2023-24

- Biological Principles and Medical Applications of Ionizing Radiation: BMP 253, RADO 253 (Spr)
- Program in Radiation Biology Seminar Series: RADO 244 (Aut, Win)

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Jess Klockow, Jimmy Xu

Doctoral Dissertation Advisor (AC)

Mindy Harkness

Postdoctoral Research Mentor

Jess Klockow

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Bioengineering (PhD Program)
- Cancer Biology (PhD Program)

Publications

PUBLICATIONS

- **Radiotherapy in combination with CD47 blockade elicits a macrophage-mediated abscopal effect.** *Nature cancer*
  Nishiga, Y., Drainas, A. P., Baron, M., Bhattacharya, D., Barkal, A. A., Ahrari, Y., Mancusi, R., Ross, J. B., Takahashi, N., Thomas, A., Diehn, M., Weissman, I. L., Graves, et al
  2022

- **Macrophages Promote Circulating Tumor Cell-Mediated Local Recurrence Following Radiation Therapy in Immunosuppressed Patients.** *Cancer research*

Rafat, M. n., Aguilera, T. A., Vilalta, M. n., Bronsart, L. L., Soto, L. A., von Eyben, R. n., Golla, M. A., Ahrari, Y. n., Melemenidis, S. n., Afghahi, A. n., Jenkins, M. J., Kurian, A. W., Horst, et al
2018

- **18F-EF5 PET Is Predictive of Response to Fractionated Radiotherapy in Preclinical Tumor Models.** *PloS one*
  Ali, R., Apte, S., Vilalta, M., Subbarayan, M., Miao, Z., Chin, F. T., Graves, E. E.
  2015; 10 (10)

- **Recruitment of circulating breast cancer cells is stimulated by radiotherapy.** *Cell reports*
  Vilalta, M., Rafat, M., Giaccia, A. J., Graves, E. E.
  2014; 8 (2): 402-409

- **Hypoxia in Models of Lung Cancer: Implications for Targeted Therapeutics** *CLINICAL CANCER RESEARCH*
  Graves, E. E., Vilalta, M., Cecic, I. K., Erler, J. T., Tran, P. T., Felsher, D., Sayles, L., Sweet-Cordero, A., Le, Q., Giaccia, A. J.
  2010; 16 (19): 4843-4852

- **DEVELOPMENT OF A MICRO-COMPUTED TOMOGRAPHY-BASED IMAGE-GUIDED CONFORMAL RADIOTHERAPY SYSTEM FOR SMALL ANIMALS** *INTERNATIONAL JOURNAL OF RADIATION ONCOLOGY BIOLOGY PHYSICS*
  Zhou, H., Rodriguez, M., van den Haak, F., Nelson, G., Jogani, R., Xu, J., Zhu, X., Xian, Y., Tran, P. T., Felsher, D. W., Keall, P. J., Graves, E. E.
  2010; 78 (1): 297-305

- **RT_Image: An open-source tool for investigating PET in radiation oncology** *TECHNOLOGY IN CANCER RESEARCH & TREATMENT*
  Graves, E. E., Quon, A., Loo, B. W.
  2007; 6 (2): 111-121

- **FLASH reduces radiation-induced oral mucositis in a mouse model of Fanconi anemia.** *Clinical and translational radiation oncology*
  Loo, P., Pan, M., Zhao, M., Melemenidis, S., Schulz, J. B., Chen, D., Whitmore, L., Richter, S., Dirbas, F. M., Casey, K. M., Graves, E. E., Epperly, M. W., Greenberger, et al
  2027; 62: 101334

- **CXCR3 Blockade Uncouples Immunotherapy-Induced Myocarditis from Anti-Tumor Immunity Through Oxygen-Dependent mTORC1/HIF1α Metabolic Adaptation**
  Sun, Y., Vitale, M., Shankar, T., Lee, M., Wagner, N., Chen, S., Liu, N., Huang, Y., Sundar, H., Zhu, W., Liu, L., Yang, X., Liu, et al
  LIPPINCOTT WILLIAMS & WILKINS.2026: A10867

- **A Phase 1 Trial Investigating the Addition of Papaverine to Stereotactic Body Radiotherapy (SBRT) for Hypoxic Radiosensitization of Lung Tumors.** *International journal of radiation oncology, biology, physics*
  Brownstein, J., Williams, T., Xu-Welliver, M., Sebastian, N., Ma, S. J., Haglund, K., Sim, A., Benej, M., Papandreou, I., Qing, K., Wei, L., Graves, E., Denko, et al
  2026

- **Biomarker-Driven Insights into Immune Checkpoint Inhibitor Therapy in Small-Cell Lung Cancer.** *Critical reviews in oncology/hematology*
  Wang, S., Zhao, X., Zeng, Y., Li, W., Huang, J., Leung, E. L., Png, S., Liang, A., Li, Y., Guan, Q., Fan, D., Liu, J., Chen, et al
  2026: 105517

- **Quantifying Protein Temporal Changes with Mass Spectrometry in Plasma Samples from Breast Cancer Patients Undergoing Radiotherapy.** *Journal of the American Society for Mass Spectrometry*
  Kapp, K. L., Going, C. C., Garcia-Marques, F. J., Leow, K., Maltos, A., Bermudez, A., Vilalta, M., Rafat, M., Jenkins, M., Chen, J. J., Mallick, P., Horst, K., Graves, et al
  2026

- **A targetable FTO/SLC7A11/CBS/CTH axis controls cysteine metabolism, growth and survival in NSCLC.** *Science advances*
  Kuganesan, N., Pan, M., Jiang, H., Melemenidis, S., Ye, J., Richter, S., Diehn, M., Casey, K. M., Graves, E. E., Le, Q. T., Rankin, E. B.
  2026; 12 (27): eaed6463

- **FLASH reduces radiation-induced oral mucositis in a mouse model of Fanconi anemia.** *bioRxiv : the preprint server for biology*
  Loo, P., Pan, M., Zhao, M., Melemenidis, S., Chen, D., Whitmore, L., Richter, S., Dirbas, F. M., Casey, K. M., Graves, E. E., Epperly, M. W., Greenberger, J., Loo, et al
  2026

- **Non-invasive Reversible Software-based Electron FLASH Irradiation Configuration of a Linear Accelerator in Clinical Use.** *International journal of radiation oncology, biology, physics*

Melemenidis, S., Chen, D., Jensen, C., Schulz, J. B., Surucu, M., Yu, A. S., Graves, E. E., Shi, M., Reilly, M., Maxim, P. G., Currell, A., Loo, B. W., Skinner, et al
2026

- **Inhibition of the m6A RNA demethylase FTO radiosensitizes cervical cancer by enhancing DNA damage: Preclinical data on an emerging novel cancer therapeutic target**
  Adams, E., Kuganesan, N., Pu, L., Liang, B., Melemenidis, S., Richter, S., Jackson, S., Ghezelayagh, T., Kidd, E., Howitt, B., Graves, E., Rankin, E.
  ACADEMIC PRESS INC ELSEVIER SCIENCE.2026: S370-S371
- **Applying a portable pocket handheld ultrasound scanner to monitor tumor volume in preclinical studies.** *Medical physics*
  Melemenidis, S., Soto, L. A., Kaffas, A. N., Ashraf, R. M., Loo, B. W., Graves, E. E.
  2026; 53 (5): e70462
- **Addressing respiratory gating latency for accurate pulse delivery in preclinical electron FLASH irradiation on a clinical linear accelerator.** *ArXiv*
  Manjappa, R., Wang, J., Melemenidis, S., Viswanathan, V., Ashraf, R., Skinner, L., Soto, L. A., Lau, B., Ko, R. B., von Eyben, R., Graves, E., Yu, S., Bush, et al
  2026
- **Addressing respiratory gating latency for accurate pulse delivery in preclinical electron FLASH irradiation on a clinical linear accelerator.** *ArXiv*
  Manjappa, R., Wang, J., Melemenidis, S., Viswanathan, V., Ashraf, R., Skinner, L., Soto, L. A., Lau, B., Ko, R. B., von Eyben, R., Graves, E., Yu, S. J., Bush, et al
  2026
- **Genetic inhibition of FTO does not exacerbate the severity of radiation-induced oral mucositis in C57BL/6 mice**
  Pan, M., Pu, L., Melemenidis, S., Graves, E., Casey, K. M., Rankin, E.
  AMER ASSOC CANCER RESEARCH.2026
- **FLASH radiotherapy maintains tumor control and enables safe re-irradiation while preserving normal tissue in breast cancer PDX models**
  Mutahar, A., Verma, B., Melemenidis, S., Dutt, S., Casey, K. M., Qi, Z., Kuo, A., Horst, K. C., Graves, E., Clarke, M. F., Loo, B. W., Dirbas, F. M.
  AMER ASSOC CANCER RESEARCH.2026
- **Impact of ultra-high dose rate (FLASH) versus conventional radiotherapy on tumor control in wild-type and cGAS-knockout mice**
  Verma, B., Mutahar, A., Melemenidis, S., Verma, R., Whitemore, L., Dutt, S., Horst, K. C., Graves, E., Clarke, M. F., Li, L., Loo, B. W., Dirbas, F. M.
  AMER ASSOC CANCER RESEARCH.2026
- **Radiation-Induced Immune Responses from the Tumor Microenvironment to Systemic Immunity.** *Cancers*
  Png, S., Tadepalli, S., Graves, E. E.
  2025; 17 (23)
- **High throughput mutational characterization of the GPCR ligand C5a using yeast display and deep sequencing.** *Structure (London, England : 1993)*
  Xu, Y., Thakkar, K., Guan, L., Miao, Y., Mehibel, M., Lee, R. B., Marciano, D., Viswanathan, V., Wang, Z., Wang, J., Ji, L., Cao, H., Petrakian, et al
  2025
- **Preclinical Water-Mediated Ultrasound Platform Using Clinical Field of View for Molecular Targeted Contrast-Enhanced Ultrasound.** *Diagnostics (Basel, Switzerland)*
  Melemenidis, S., Kim, A. S., Vo-Phamhi, J. M., Graves, E. E., El Kaffas, A. N., Hristov, D.
  2025; 15 (17)
- **Tumor-educated cells in tumor microenvironment: Key drivers of immunotherapy resistance.** *Chinese journal of cancer research = Chung-kuo yen cheng yen chiu*
  Zou, J., Wang, S., Zhang, Y., Tian, W., Mai, G., Xu, Y., Xiao, W., Graves, E. E., Wu, F.
  2025; 37 (3): 446-465
- **FTO inhibition enhances the therapeutic index of radiation therapy in head and neck cancer.** *JCI insight*
  Ji, L., Pu, L., Wang, J., Cao, H., Melemenidis, S., Sinha, S., Guan, L., Laseinde, E. E., von Eyben, R., Richter, S. A., Nam, J. M., Kong, C., Casey, et al
  2025; 10 (11)

- **Augmentation of [18F]-C-SNAT4 PET imaging of apoptosis after radiotherapy using a cold mixing strategy.** *EJNMMI research*
  Qiu, J., Chen, M., Chen, Z., Beinat, C., Melemenidis, S., Graves, E., Rao, J.
  2025; 15 (1): 65

- **CD301b+ monocyte-derived dendritic cells mediate resistance to radiotherapy.** *The Journal of experimental medicine*
  Tadepalli, S., Clements, D. R., Raquer-McKay, H. M., Lüdtke, A., Saravanan, S., Seong, D., Vitek, L., Richards, C. M., Carette, J. E., Mack, M., Gottfried-Blackmore, A., Graves, E. E., Idoyaga, et al
  2025; 222 (6)

- **Effectiveness of FLASH vs. Conventional Dose Rate Radiotherapy in a Model of Orthotopic, Murine Breast Cancer.** *Cancers*
  Melemenidis, S., Viswanathan, V., Dutt, S., Kapadia, N., Lau, B., Soto, L. A., Ashraf, M. R., Thakur, B., Mutahar, A. Z., Skinner, L. B., Yu, A. S., Surucu, M., Casey, et al
  2025; 17 (7)

- **Novel Therapeutic Approach Targeting CXCR3 to Treat Immunotherapy Myocarditis.** *Circulation research*
  Huang, Y. V., Sun, Y., Chou, H., Wagner, N., Vitale, M. R., Bayer, A. L., Xu, B., Lee, D., Lin, Z., Branche, C., Waliany, S., Neal, J. W., Wakelee, et al
  2025

- **Macrophage mediated abscopal effects of radiation therapy**
  Nishiga, Y., Graves, E., Sage, J.
  WILEY.2025: 821

- **Gold-siRNA supraclusters enhance the anti-tumor immune response of stereotactic ablative radiotherapy at primary and metastatic tumors.** *Nature biotechnology*
  Jiang, Y., Cao, H., Deng, H., Guan, L., Langthasa, J., Colburg, D. R., Melemenidis, S., Cotton, R. M., Aleman, J., Wang, X. J., Graves, E. E., Kalbasi, A., Pu, et al
  2024

- **Dosimetric calibration of anatomy-specific ultra-high dose rate electron irradiation platform for preclinical FLASH radiobiology experiments.** *Medical physics*
  Wang, J., Melemenidis, S., Manjappa, R., Viswanathan, V., Ashraf, R. M., Levy, K., Skinner, L. B., Soto, L. A., Chow, S., Lau, B., Ko, R. B., Graves, E. E., Yu, et al
  2024

- **Multi-Institutional Audit of FLASH and Conventional Dosimetry with a 3D-Printed Anatomically Realistic Mouse Phantom.** *International journal of radiation oncology, biology, physics*
  Ashraf, M. R., Melemenidis, S., Liu, K., Grilj, V., Jansen, J., Velasquez, B., Connell, L., Schulz, J. B., Bailat, C., Libed, A., Manjappa, R., Dutt, S., Soto, et al
  2024

- **Exploring deep learning for estimating the isoeffective dose of FLASH irradiation from mouse intestinal histology images.** *International journal of radiation oncology, biology, physics*
  Fu, J., Yang, Z., Melemenidis, S., Viswanathan, V., Dutt, S., Manjappa, R., Lau, B., Soto, L. A., Ashraf, R., Skinner, L., Yu, S. J., Surucu, M., Casey, et al
  2024

- **Improving radiotherapy in immunosuppressive microenvironments by targeting complement receptor C5aR1.** *The Journal of clinical investigation*
  Beach, C., MacLean, D., Majorova, D., Melemenidis, S., Nambiar, D. K., Kim, R. K., Valbuena, G. N., Guglietta, S., Krieg, C., Darvish-Damavandi, M., Suwa, T., Easton, A., Hillson, et al
  2023

- **Rapid recruitment and IFN-I-mediated activation of monocytes dictate focal radiotherapy efficacy.** *Science immunology*
  Tadepalli, S., Clements, D. R., Saravanan, S., Arroyo Hornero, R., Lüdtke, A., Blackmore, B., Paulo, J. A., Gottfried-Blackmore, A., Seong, D., Park, S., Chan, L., Kopecky, B. J., Liu, et al
  2023; 8 (84): eadd7446

- **Clinical LINAC-based electron FLASH: Pathway for practical translation to FLASH clinical trials: LINAC electron FLASH.** *International journal of radiation oncology, biology, physics*
  No, H. J., Wu, Y. F., Dworkin, M. L., Manjappa, R., Skinner, L., Ashraf, M. R., Lau, B., Melemenidis, S., Viswanathan, V., Yu, A. S., Surucu, M., Schüler, E., Graves, et al

2023

- **Technical Note: Non-Invasive monitoring of normal tissue radiation damage using spectral quantitative ultrasound spectroscopy.** *Medical physics*
  Rafat, M., Kaffas, A. E., Swarnakar, A., Shostak, A., Graves, E. E.
  2022

- **Design and validation of a dosimetric comparison scheme tailored for ultra-high dose-rate electron beams to support multicenter FLASH preclinical studies.** *Radiotherapy and oncology : journal of the European Society for Therapeutic Radiology and Oncology*
  Gonçalves Jorge, P., Melemenidis, S., Grilj, V., Buchillier, T., Manjappa, R., Viswanathan, V., Gondré, M., Vozenin, M. C., Germond, J. F., Bochud, F., Moeckli, R., Limoli, C., Skinner, et al
  2022

- **Real-time optical oximetry during FLASH radiotherapy using a phosphorescent nanoprobe.** *Radiotherapy and oncology : journal of the European Society for Therapeutic Radiology and Oncology*
  Ha, B., Liang, K., Liu, C., Melemenidis, S., Manjappa, R., Viswanathan, V., Das, N., Ashraf, R., Lau, B., Soto, L., Graves, E. E., Rao, J., Loo, et al
  2022

- **Radiotherapy alters expression of molecular targets in prostate cancer in a fractionation- and time-dependent manner.** *Scientific reports*
  Eke, I., Aryankalayil, M. J., Bylicky, M. A., Makinde, A. Y., Liotta, L., Calvert, V., Petricoin, E. F., Graves, E. E., Coleman, C. N.
  2022; 12 (1): 3500

- **TRACKING INNATE IMMUNE ACTIVATION IN A MOUSE MODEL OF PARKINSON'S DISEASE USING TREM1 AND TSPO PET TRACERS.** *Journal of nuclear medicine : official publication, Society of Nuclear Medicine*
  Lucot, K. L., Stevens, M. Y., Bonham, T. A., Azevedo, E. C., Chaney, A. M., Webber, E. D., Jain, P., Klockow, J. L., Jackson, I. M., Carlson, M. L., Graves, E. E., Montine, T. J., James, et al
  2022

- **C3aR Signaling Inhibits NK-cell Infiltration into the Tumor Microenvironment in Mouse Models.** *Cancer immunology research*
  Nandagopal, S., Li, C. G., Xu, Y., Sodji, Q. H., Graves, E. E., Giaccia, A. J.
  2021

- **Long-term expression changes of immune-related genes in prostate cancer after radiotherapy.** *Cancer immunology, immunotherapy : CII*
  Eke, I., Aryankalayil, M. J., Bylicky, M. A., Sandfort, V., Vanpouille-Box, C., Nandagopal, S., Graves, E. E., Giaccia, A. J., Coleman, C. N.
  2021

- **The lncRNAs LINC00261 and LINC00665 are upregulated in long-term prostate cancer adaptation after radiotherapy.** *Molecular therapy. Nucleic acids*
  Eke, I., Bylicky, M. A., Sandfort, V., Chopra, S., Martello, S., Graves, E. E., Coleman, C. N., Aryankalayil, M. J.
  2021; 24: 175–87

- **Pharmacological Regulation of Tumor Hypoxia in Model Murine Tumors and Spontaneous Canine Tumors.** *Cancers*
  Benej, M., Wu, J., Kreamer, M., Kery, M., Corrales-Guerrero, S., Papandreou, I., Williams, T. M., Li, Z., Graves, E. E., Selmic, L. E., Denko, N. C.
  2021; 13 (7)

- **Pharmacological Regulation of Tumor Hypoxia in Model Murine Tumors and Spontaneous Canine Tumors** *CANCERS*
  Benej, M., Wu, J., Kreamer, M., Kery, M., Corrales-Guerrero, S., Papandreou, I., Williams, T. M., Li, Z., Graves, E. E., Selmic, L. E., Denko, N. C.
  2021; 13 (7)

- **Y box binding protein 1 inhibition as a targeted therapy for ovarian cancer.** *Cell chemical biology*
  Tailor, D., Resendez, A., Garcia-Marques, F. J., Pandrala, M., Going, C. C., Bermudez, A., Kumar, V., Rafat, M., Nambiar, D. K., Honkala, A., Le, Q., Sledge, G. W., Graves, et al
  2021

- **Effects of Focal Ionizing Radiation of the Squid Stellate Ganglion on Synaptic and Axonal Transmission in the Giant-Fiber Pathway.** *Cureus*
  Gilly, W. F., Teal, P., Graves, E. E., Lo, J., Schneider, M. B., Zasio, R., Adler, J. R.
  2021; 13 (2): e13110

- **Effects of Focal Ionizing Radiation of the Squid Stellate Ganglion on Synaptic and Axonal Transmission in the Giant-Fiber Pathway** *CUREUS*
  Gilly, W. F., Teal, P., Graves, E. E., Lo, J., Schneider, M., Zasio, R., Adler, J. R.

2021; 13 (2)

- **The HIF target MAFF promotes tumor invasion and metastasis through IL11 and STAT3 signaling.** *Nature communications*
  Moon, E. J., Mello, S. S., Li, C. G., Chi, J., Thakkar, K., Kirkland, J. G., Lagory, E. L., Lee, I. J., Diep, A. N., Miao, Y., Rafat, M., Vilalta, M., Castellini, et al
  2021; 12 (1): 4308

- **FLASH irradiation enhances the therapeutic index of abdominal radiotherapy in mice**
  Natarajan, S., Levy, K., Wang, J., Chow, S., Eggold, J., Loo, P., Manjappa, R., Lartey, F. M., Schuler, E., Skinner, L., Rafat, M., Ko, R., Kim, et al
  AMER ASSOC CANCER RESEARCH.2020

- **Reprogramming of serine metabolism during breast cancer progression**
  Li, A., Ducker, G. S., Li, Y., Seoane, J. A., Xiao, Y., Melemenidis, S., Zhou, Y., Liu, L., Vanharanta, S., Graves, E. E., Rankin, E. B., Curtis, C., Massague, et al
  AMER ASSOC CANCER RESEARCH.2020

- **Visualizing innate immune activation in a mouse model of Parkinson's disease using a highly specific TREM1-PET tracer.**
  Lucot, K., Stevens, M., Jain, P., Bonham, T., Webber, E., Klockow, J., Azevedo, E., Chaney, A., Graves, E., Montine, T., James, M.
  SOC NUCLEAR MEDICINE INC.2020

- **An activatable NIR fluorescent rosol for selectively imaging nitroreductase activity** *SENSORS AND ACTUATORS B-CHEMICAL*
  Klockow, J. L., Hettie, K. S., LaGory, E. L., Moon, E., Giaccia, A. J., Graves, E. E., Chin, F. T.
  2020; 306

- **An Activatable NIR Fluorescent Rosol for Selectively Imaging Nitroreductase Activity.** *Sensors and actuators. B, Chemical*
  Klockow, J. L., Hettie, K. S., LaGory, E. L., Moon, E. J., Giaccia, A. J., Graves, E. E., Chin, F. T.
  2020; 306

- **Induced tumor heterogeneity reveals factors informing radiation and immunotherapy combinations.** *Clinical cancer research : an official journal of the American Association for Cancer Research*
  Aguilera, T. A., Elghonaimy, E., Shehade, H., Rafat, M., Castellini, L., Jiang, D., Kariolis, M., Koong, A., Le, Q., Ellies, L. G., Rankin, E. B., Graves, E. E., Giaccia, et al
  2020

- **Extracellular cGAMP is a cancer cell-produced immunotransmitter involved in radiation-induced anti-cancer immunity.** *Nature cancer*
  Carozza, J. A., Böhnert, V., Nguyen, K. C., Skariah, G., Shaw, K. E., Brown, J. A., Rafat, M., von Eyben, R., Graves, E. E., Glenn, J. S., Smith, M., Li, L.
  2020; 1 (2): 184-196

- **Abdominal FLASH irradiation reduces radiation-induced gastrointestinal toxicity for the treatment of ovarian cancer in mice.** *Scientific reports*
  Levy, K. n., Natarajan, S. n., Wang, J. n., Chow, S. n., Eggold, J. T., Loo, P. E., Manjappa, R. n., Melemenidis, S. n., Lartey, F. M., Schüler, E. n., Skinner, L. n., Rafat, M. n., Ko, et al
  2020; 10 (1): 21600

- **FLASH Irradiation Results in Reduced Severe Skin Toxicity Compared to Conventional-Dose-Rate Irradiation.** *Radiation research*
  Soto, L. A., Casey, K. M., Wang, J. n., Blaney, A. n., Manjappa, R. n., Breitkreutz, D. n., Skinner, L. n., Dutt, S. n., Ko, R. B., Bush, K. n., Yu, A. S., Melemenidis, S. n., Strober, et al
  2020

- **Evaluating the Reproducibility of Mouse Anatomy under Rotation in a Custom Immobilization Device for Conformal FLASH Radiotherapy.** *Radiation research*
  Ko, R. B., Soto, L. A., von Eyben, R. n., Melemenidis, S. n., Rankin, E. B., Maxim, P. G., Graves, E. E., Loo, B. W.
  2020

- **Intravital imaging reveals synergistic effect of CAR T-cells and radiation therapy in a preclinical immunocompetent glioblastoma model** *Oncoimmunology*
  Murty, S., Haile, S. T., Beinat, C., Aalipour, A., Alam, I. S., Murty, T., Shaffer, T. M., Patel, C. B., Graves, E. E., Mackall, C. L., Gambhir, S. S.
  2020; 9 (1)

- **Metabolic Profiling Reveals a Dependency of Human Metastatic Breast Cancer on Mitochondrial Serine and One-Carbon Unit Metabolism.** *Molecular cancer research : MCR*

Li, A. M., Ducker, G. S., Li, Y. n., Seoane, J. A., Xiao, Y. n., Melemenidis, S. n., Zhou, Y. n., Liu, L. n., Vanharanta, S. n., Graves, E. E., Rankin, E. B., Curtis, C. n., Massague, et al
2020

- **53BP1/RIF1 signaling promotes cell survival after multifractionated radiotherapy.** *Nucleic acids research*
  Eke, I., Zong, D., Aryankalayil, M. J., Sandfort, V., Bylicky, M. A., Rath, B. H., Graves, E. E., Nussenzweig, A., Coleman, C. N.
  2019
- **Radiosensitization of Head and Neck Squamous Cell Carcinoma (HNSCC) by a Podophyllotoxin.** *ACS medicinal chemistry letters*
  Resendez, A., Tailor, D., Graves, E., Malhotra, S. V.
  2019; 10 (9): 1314–21
- **2 ' 3 '-cGAMP is an immunotransmitter produced by cancer cells and regulated by ENPP1**
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