Stavros Melemenidis, PhD

Radiation Oncology, Stanford University
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CURRENT POSITION

Stanford University, Dept. Radiation Oncology, Stanford, CA 2016-present

Postdoctoral Fellow

EDUCATION

University of Oxford, Dept. Radiation Oncology, Oxford, UK 2010-2015

- D.Phil. Radiation Biology. Mentors: Prof. Nicola Sibson, Prof. Ruth Muschel.
- Thesis: Development of molecular targeted imaging methods for the detection of lung metastasis and angiogenesis.

University of Oxford, Dept. Radiation Oncology, Oxford, UK 2009-2010

- M.Sc. Radiation Biology

University of Liverpool, Dept. Physics, Liverpool, UK 2008-2009

- M.Sc. Radiometrics; Instrumentation and Modelling

University of Liverpool, Dept. Physics, Liverpool, UK 2005-2008

- B.Sc. Physics: Medical Applications

IIEK Neapoleos, Technical College, Thessaloniki, Greece 1998-2000

- A.Eng. PC Systems and Peripheral Equipment

RESEARCH EXPERIENCE

Stanford University, Dept. Radiation Oncology, Stanford, CA Feb 2016-present

Postdoctoral Fellow; Advisor: Edward E. Graves.
Development of *in vivo* mouse tumor models for imaging, radiotherapy and immunotherapy.

- Characterized ultrasound (US)-guided injections; tumor-mouse models for liver metastasis
- Investigate immune cell migration; macrophage imaging
- Evaluated radioprotection of healthy tissue; drug development
- Delivered precise radiation therapy with CT-based treatment planning
- Innovated an *in vivo* water-mediated platform for molecular Contrast Enhanced US (mCEUS); targeted microbubbles (TMB)

University of Oxford, Dept. Radiation Oncology, Oxford, UK**,** Jan 2015-Sep 2015

Postdoctoral Fellow; Advisor: Nicola R. Sibson.
Design and evaluation of novel imaging probes for sensitive imaging of metastasis and angiogenesis.

- Characterized a dual MRI/PET probe for metastasis and an MRI probe for angiogenesis
- Innovated a double micro-metastasis tumor-model; lungs and brain
- Detected early stages of metastasis and angiogenesis
- Quantified and correlated imaging datasets with histological staining
- Established and organized an international collaboration with Duke University
- Performed *in vivo* bright lung MRI with hyperpolarized Xenon and Helium

SKILLS & TECHNIQUES

Animal work

- UK Home Office personal license holder for rodents.
- Compliance with US animal facilities under APLAC.
- Syngeneic and xerograph tumor-mouse models.
- Inoculations; intra-venous, -peritoneal, US-guided intra-cardiac, -splenic, -renal and -hepatic.
- Recovery micro-surgical inoculations: intra-cranial, -splenic, -renal and -hepatic.
- Tracheotomy, lungs inflation, tissue collection, tissue perfusion-fixation.
- Tumor volume measurements, necropsy, *post mortem* scoring of peritoneal metastatic lesions.

***In vivo* imaging**

- MRI; 4.7, 7.0 & 9.4T (VARIAN; Agilent) and 7.0T (Bruker).
- Magnetic Particle Imaging (MPI); prototype (Magnetic Insight).
- PET/CT; Inveon PET/CT (Siemens Preclinical Solutions).
- CT; Skyscan 1276 (Bruker), CT120 (TriFoil Imaging) and PXi SmART (Precision X-Ray).
- US; VIVO 2100 (Visual Sonics) and clinical EPIQ7 (Philips).
- BLI; IVIS Spectrum (Xenogen) and SII Lago-X (Spectral Inst).
- Design and modification of mouse cradles.

Radiotherapy

- Precise radiation image-guided radiotherapy with PXi SmART (Precision X-Ray).
- Radiation delivery with shielding; first generation X-Ray cabinet irradiators.
- CT-based treatment planning; multiple angle delivery with collimation.
- Fractionated radiotherapy; biological effective dose (BED) implementation.

Immunotherapy combined with radiation

- Anti-CTLA-4, anti-PD-1 antibodies and Annexin V.
- Anti-C5aR small molecule (PMX205).

Histology

- Tissue sectioning; cryostat and microtome.
- Histology; IHC and IF with paraffin and frozen sections, and cytochemistry.
- Troubleshooting and optimization of staining.
- Microscopy; Luminescence, Fluorescence and Confocal.

Laboratory experience

- Tissue culture: seeding, culturing, freezing and storing cell-lines.
- Counting cell and cell injection preparation.
- Standard protocols assays; FACS, ELISA, Western blot.
- Radiation authorized worker.
- Biohazard level 2 authorized worker.
- General management and ordering.

IT skills

- Statistical analysis; Poisson, Chi-square and Student-t distributions.
- Experience with Monte Carlo simulations on MCNP and MATLAB.
- Image processing; 3D slicer, ITK-SNAP, Image Scope, Image-Pro, RT-Image, ImageJ.
- Excellent user of Office applications and Prism.

PUBLICATIONS

Melemenidis S. Knight JC, Kersemans V, Perez-Balderas F, Zarghami N, Sarmiento Soto M, Bart Cornelissen B, Muschel RJ, Sibson NR. (2019) In vivo PET detection of lung micrometastasis by targeting endothelial VCAM-1. *EJNMMI* (In revision: EJNM-D-19-01107).

Wu W and Klockow JL, Mohanty S, Ku KS, Aghighi M, **Melemenidis S**, Chen Z, Li K, Morais GR, Zhao N, Schlegel J, Graves EE, Rao J, Loadman PM, Falconer RA, Mukherjee S, Chin FT, Daldrup-Link HE. (2019) Theranostic nanoparticles enhance the response of glioblastomas to radiation. *Nanotheranostics* (doi:10.7150/ntno.35342).

Ye J, Thompson C, Li A, Ducker G, Li Y, Seoane J, Xiao Y, **Melemenidis S**, Zhou Y, Liu L, Rabinowitz J, Vanharanta S, Graves E, Rankin E, Curtis C, and Massague J. (2019) Metabolic profiling reveals a dependency of human metastatic breast cancer on mitochondrial serine and one-carbon unit metabolism. *Mol Cancer Res* (In revision: MCR-19-0606-ATR).

Rafat M, Aguilera TA, Vilalta M, Bronsart LL, Soto LA, von Eyben R, Golla MA, Ahrari Y, **Melemenidis S**, Afghahi A, Jenkins MJ, Kurian AW, Horst KC, Giaccia AJ, Graves EE. (2018) Macrophages Promote Circulating Tumor Cell-Mediated Local Recurrence following Radiotherapy in Immunosuppressed Patients. *Cancer Res* (PMID: 29880480).

Melemenidis S, Jefferson A, Ruparelia N, Akhtar AM, Xie J, Allen D, Hamilton A, Larkin JR, Perez-Balderas F, Smart SC, Muschel RJ, Chen X, Sibson NR, Choudhury RP. (2015) Quantitative molecular magnetic resonance imaging of angiogenesis *in vivo* using polyvalent cyclic RGD-iron oxide microparticle conjugates. *Theranostics* (PMID: 25767618).

REVIEW ARTICLES

Olcina MM, Kim RK, **Melemenidis S**, Graves EE, Giaccia AJ. The tumour microenvironment links complement system dysregulation and hypoxic signaling. (2018) *Br J Radiol* (PMID: 29544344).

MANUSCRIPT IN PREPARATION

Melemenidis S, Kim A, Kaffas EIA, Abid D, Graves EE, Hristov D. Water-mediated molecular contrast enhanced ultrasound with a clinical system and for detection of radiation-induced differential expression of P-selectin in subcutaneous tumors.

Olcina MM, **Melemenidis S**, Kim, RK., Nambiar, DK., Mizuno K, Casey KM. von Eyben, R, Graves EE, G, Le, Quynh-Thu, Stucki M, Giaccia AJ. Targeting the complement system in combination with radiotherapy improves tumor response and reduces radiation-induced toxicity.

CONFERENCE PRESENTATIONS

Oral presentation: Development of tumor models to study normal tissue radioprotection by C5aR1 inhibition. Aegean Conferences: 12th International Conference on Complement Therapeutics. Rhodes, Greece, July 2019.

Poster presentation: Inhibiting C5a-C5aR pathway to improve radiation response. Aegean Conferences: 5th International Conference for Tumour Microenvironment and Cellular Stress. Greece, Crete, June 2018.

Poster presentation 1: *In vivo* PET detection of lung metastasis by targeting endothelial VCAM-1**.**

Poster presentation 2: Molecular MRI for the detection of tumour angiogenesis. Aegean Conferences: 3rd International Conference for Tumour Microenvironment and Cellular Stress. Greece, Mykonos, September 2014.

Poster presentation: Development of a new molecular imaging approach for early detection of lung metastasis. TOPIM: Imaging the hallmarks of cancer. Les Houches, France, January 2013.

Oral presentation: Development of a new molecular imaging approach for early detection of lung metastasis. ESTRO: Novel Targeted Drugs and Radiotherapy. Toulouse, France, September 2012.

Oral and Poster presentation: Development of *in-vivo* hyperpolarised gas molecular MRI method for early detection of lung metastasis, targeting VCAM-1. Keystone Symposium: Inflammation during Carcinogenesis. Dublin, Ireland, May 2012.

AWARDS & HONOURS

Recognition of excellent research: Aegean Conferences: 12th International Conference on Complement Therapeutics. Rhodes, Greece, 2019.

Poster Prize: Aegean Conferences: 3rd International Conference for Tumour Microenvironment and Cellular Stress. Greece, Mykonos, 2014.

Invited presentation: Oxford Cancer Imaging Center Retreat, 2014 and 2013.

Invited presentation: Oxford Institute Metastasis Symposium, 2014.

REFERENCES

Prof Edward E Graves

Title: Associate Professor of Radiation Oncology (Radiation Physics) and director of Molecular Imaging Program at Stanford.

Department: Radiation Oncology - Radiation Physics, University of Stanford School of Medicine.

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Prof Nicola R Sibson
Title: Professor of Oxford Institute for Radiation Oncology and Senior group leader of Experimental Neuroimaging group.
Department: Radiation Oncology, University of Oxford.
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Prof Dimitri Hristov
Title: Associate Professor of Radiation Oncology (Radiation Physics) and Medical Center Line.
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