CURRICULUM VITAE

NAME

Russell Rockne
Russell.Rockne@northwestern.edu

POSITION TITLE
Northwestern University
Department of Neurological Surgery
Research Associate

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	YEAR(s)	FIELD OF STUDY
University of Colorado, Boulder, CO	BS	2002	Mathematics
University of Washington, Seattle, WA	MS	2006	Mathematical Biology
University of Washington, Seattle, WA *in progress*	PhD	Expected 2013	Mathematical Biology

Current Job Responsibilities

Supervise 25+ research staff and students
Establish scientific goals and milestones in accordance with grant directives and reporting deadlines
Present research to domestic and international biomedical and mathematical societies
Manage day to day activities of research projects and grant deliverables
Contribute to all aspects of grant and manuscript preparation from budget, specific aims, research plan, etc.
Design and implementation of large scale data and analysis workflow systems
IRB application, renewal, modification and approval processes

Professional Experience

2012-present Research Associate, Neurological Surgery, Northwestern University, Chicago, IL
2006-2012 Research Scientist, Pathology & Applied Mathematics, University of Washington, Seattle, WA
2002-2004 Mathematics Instructor, Edmonds Community College, Mercer Island private high school, WA

Memberships

European Society for Theoretical and Mathematical Biology (ESTMB)
Society of Mathematical Biology (SMB)
Society of Industrial and Applied Mathematics (SIAM)
Society for Neuro-Oncology (SNO)
Society for Nuclear Medicine (SNM)
American Mathematical Society (AMS)
Radiation Research Society (RRS)
American Association for Cancer Research (AACR)

Awards

Robert's prize nominee
Top 10 paper of the year for Physics in Medicine and Biology 2011

Rockne, R, Rockhill JK, Mrugala M, Spence AM, Kalet I, Hendrickson K, Lai A, Cloughsey T, Alvord EC Jr., Swanson KR: Predicting the efficacy of radiotherapy in individual glioblastoma patients *in vivo*: a mathematical modeling approach. *Physics in Medicine and Biology*, **55**: 3271-3285 2010. PubMed ID: 20484781

Best Abstract 2011
36th Annual Western Regional Society for Nuclear Medicine

Rockne R, Champley K, Alessio A, Muzi M, Krohn KA, Kinahan PE, Swanson KR. Patient-specific simulations allow prediction of hypoxia and [18F]FMISO-PET in human glioblastoma. Seattle, WA

Awards cont.

Clinical research paper of the year 2009

Swanson KR, Chakraborty G, Wang CH, **Rockne R**, Harpold HLP, Muzi M, Anderson TCH, Krohn KA, Spence AM: Complimentary but Distinct Roles for MRI and 18F-Fluoromisonidazole PET in the Assessment of Human Glioblastomas. *Journal of Nuclear Medicine*, **50**: 36-44 2009.
PubMed ID: 19091885

Patents filed

"Method and system for characterizing tumors"
K. R. Swanson. E. C. Alvord, Jr., J. D. Murray, **R. Rockne**
File date: 2/19/2010
Application #: US 12/709,367

Articles - Peer Reviewed

1. **Rockne R**, Alvord EC Jr., Rockhill J K, Swanson K R: A mathematical model for brain tumor response to radiation therapy. *Journal of Mathematical Biology*, Special Issue on Computational Oncology, 2009 **58**(4-5):561-78
PubMed ID**:** 18815786
2. **Rockne R**, Alvord E C Jr., Reed P, Swanson K R: Modeling the growth and invasion of gliomas, from simple to complex: the Goldie Locks paradigm. BIOMAT 2007 International Symposium on Mathematical and Computational Biology. Ed. Mondaini R. 2008 World Scientific
3. Swanson K R, Harpold H L P, Peacock D L, **Rockne R**, Pennington C, Kilbride L, Grant R, Wardlaw J, Alvord E C, Jr. Velocity of Radial Expansion of Contrast-Enhancing Gliomas and Effectiveness of Radiotherapy in Individual Patients: A Proof of Principle. *Clinical Oncology,* 2008 20: 301-308
PubMed ID**:** 18308523
4. Swanson KR, Chakraborty G, Wang CH, **Rockne R**, Harpold HLP, Muzi M, Anderson TCH, Krohn KA, Spence AM: Complimentary but Distinct Roles for MRI and 18F-Fluoromisonidazole PET in the Assessment of Human Glioblastomas. *Journal of Nuclear Medicine*, 2009 **50**: 36-44.
PubMed ID**:** 19091885
5. Szeto MD, Chakraborty G, Hadley J, **Rockne R**, Muzi M, Alvord E C Jr., Krohn K, Spence A M, Swanson K R: Quantitative Metrics of Net Proliferation and Invasion Link Biological Aggressiveness Assessed by MRI with Hypoxia Assessed by FMISO-PET in Newly Diagnosed Glioblastomas. *Cancer Research*, 2009 **69**(10):4502-9
PubMed ID**:** 19934335
6. Wang C, Rockhill JK, Mrugala M, Peacock DL, Lai A, Jusenius K, Wardlaw JM, Cloughesy T, Spence AM, **Rockne R**, Alvord EC Jr., Swanson KR: Prognostic significance of growth kinetics in newly diagnosed glioblastomas revealed by combining serial imaging with a novel bio-mathematical model. *Cancer Research,* 2009 **69**(23): 9133-9140
PubMed ID**:** 19366800
7. Assefa M, **Rockne R**, Szeto M, Swanson KR. Mathematical Modeling of Glioma Proliferation and Diffusion. *Ethnicity and Disease*, 2009 **19**:2, Supplement 3
PubMed ID**:** 19554787
8. Swanson KR, Chakraborty G, Wang CH, **Rockne R**, Harpold HLP, Muzi M, Anderson TCH, Krohn KA, Spence AM: Complimentary but Distinct Roles for MRI and 18F-Fluoromisonidazole PET in the Assessment of Human Glioblastomas. *Journal of Nuclear Medicine*, 2009 **50**: 36-44.
PubMed ID**:** 19091885

9. **Rockne, R**, Rockhill JK, Mrugala M, Spence AM, Kalet I, Hendrickson K, Lai A, Cloughsey T, Alvord EC Jr., Swanson KR: Predicting the efficacy of radiotherapy in individual glioblastoma patients *in vivo*: a mathematical modeling approach. *Physics in Medicine and Biology*, 2010 **55**: 3271-3285.
PubMed ID**:** 20484781
***Robert's prize nominee for paper of the year 2010**

10. Basanta D, Scott JG, **Rockne R,** Swanson KR, Anderson ARA: The role of IDH1 mutated tumor cells in secondary glioblastomas: an evolutionary game theoretical view. *Physical Biology.* **8**(2011)
PubMed ID**:** 21301070

11. Bohman LE, Swanson KR, Moore JL, **Rockne R**, Mandigo C, Hankinson T, Assanah M, Canoll P, Bruce JN. Preoperative MRI Characteristics of Glioblastoma Multiforme: Implications for Understanding Glioma Ontogeny. *Neurosurgery,* 67(5):1319-27, 2010
PubMed ID: 20871424

12. Gu S, Chakraborty G, Champley K, Alessio A, Claridge J, **Rockne R**, Muzi M, Krohn KA, Spence AM, Alvord EC Jr., Anderson ARA, Kinahan P, Swanson KR. Applying A Patient-Specific Bio-Mathematical Model of Glioma Growth to Develop Virtual [18F]-FMISO PET Images. *Mathematics in Medicine and Biology* 2011 Article DOI: 10.1093/imammb/dqr002 In: Computation modeling in cancer special double issue: IMA Mathematical Medicine and Biology. Ed. Rejniak K, Anderson ARA.
PubMed ID: 21562060

13. Swanson KR, **Rockne R**, Claridge J, Chaplain MA, Alvord EC Jr., Anderson ARA. Quantifying the role of angiogenesis in malignant progression of gliomas: *In silico* modeling integrates imaging and histology. Cancer Res. 71(24):7366-75, 2011
PubMed ID: 21900399

14. Baldock A, **Rockne R**, Boone A, Neal M, Mrugala M M, Rockhill J K, Swanson K R. Patient-specific mathematical neuro-oncology: Predicting prognosis and treatment response in individual glioblastoma patients. *Expert Reviews in Neurotheraputics*. *Submitted*

15. Sodt R, **Rockne R**, Neal M L, Kalet I, Swanson K R. Quantifying the role of antisotropic invasion in human glioblastoma. *Accepted – in press*

16. Alvord E C, Jr., **Rockne R**, Rockhill J K, Mrugala M M, Rostomily R, Lai A, Cloughessy T, Wardlaw J M, Spence A M, Swanson K R. Know thy enemy: Paradoxes to be exploited in the war against glioblastoma. *Submitted*

17. R. Sodt, **R. Rockne**, M. L. Neal, I. Kalet, K. R. Swanson. Quantifying the role of antisotropic invasion in human glioblastoma. In Press

18. C. Holdsworth, D. Corwin, R. D. Stewart, **R. Rockne**, A. D. Trister, K. R. Swanson, M. Philips. Adaptive IMRT using a multiobjective evolutionary algorithm integrated with a diffusion-invasion model of glioblastoma. Physics in Medicine and Biology, 57(24):8271-83, Nov 2012
PubMed ID: 23190554

19. M. L. Neal, A. D. Trister, T. Cloke, R. Sodt, S. Ahn, A. L. Baldock, C. Bridge, A. Lai, T. Cloughesy, M. M. Mrugala, J. K. Rockhill**, R. Rockne**, K. R. Swanson. Discriminating survival outcomes in patients with glioblastoma using a simulation-based, patient-specific response metric. 8(1): e51951 PLOS One, Jan 2013
PubMedID: 23372647

20. M. L. Neal, A. D. Trister, S. Ahn, A. L. Baldock, C. A. Bridge, L. Guyman, J. Lange1, R. Sodt, T. Cloke, A. Lai, T. F. Cloughesy, M. M. Mrugala, J. K. Rockhill, **R. C. Rockne**, K. R. Swanson. Response classification based on a minimal model of glioblastoma growth is prognostic for clinical outcomes and distinguishes progression from pseudoprogression. Cancer Research, Accepted Pending Revision

Contributed Works

Rockne R, Alvord EC Jr., Szeto M, Gu S, Chakraborty G, Swanson KR: Modeling Diffusely Invading Brain Tumors: An Individualized Approach to Quantifying Glioma Evolution and Response to Therapy. In: Selected Topics in Cancer Modeling: Genesis, Evolution, Immune Competition, and Therapy. Ed. Bellomo N, Chaplain M, de Angelis E. Birkhauser, Boston MA. 2008 ISBN-13 13 978-0817647124

Chakraborty G, Sodt R, Massey S, Gu S, **Rockne R**, Alvord EC Jr., Swanson KR. Bridging from Multi-scale Modeling to Practical Clinical Applications in the Study of Human Gliomas. In: Multiscale Cancer Modeling. Ed. Deisboeck T, Stamatakos G. CRC Press. ISBN-10 1439814406

Theses

A mathematical model for brain tumor response to radiation therapy.
Master's Degree in Applied Mathematics, University of Washington, Seattle, WA. Advisor: Kristin R. Swanson

Abstracts

Swanson KR, Chakraborty G, **Rockne R**, Wang C, Peacock DL, Muzi M, Alvord EC Jr., Krohn K, Spence AM. A Mathematical Model for Glioma Growth and Invasion Links Biological Aggressiveness Assessed by MRI with Hypoxia Assessed by FMISO-PET. 53rd Annual Meeting of the Society for Nuclear Medicine (Platform Presentation), June 2007 - J Nucl Med. 2007; 48 (Supplement 2):151P

Swanson KR, **Rockne R**, Rockhill JK, Alvord EC Jr.: Mathematical modeling of radiotherapy in individual glioma patients: quantifying and predicting response to radiation therapy. American Association of Cancer Researchers Annual Meeting. Los Angeles, CA, 2007 (AACR)

Swanson KR, **Rockne R**, Rockhill JK, Alvord EC Jr.: Combining mathematical modeling with serial MR imaging to quantify and predict response to radiation therapy in individual glioma patient. Annual Meeting of the Society for Neuro-Oncology. Dallas, TX, 2007 (SNO)

Rockne R, Swanson KR. Predicting efficacy of radiotherapy in individual glioma patients in vivo: a pilot study. European Society for Mathematical and Theoretical Biology Annual Meeting, Edinburgh, Scotland 2008 (ECMTB)

Rockne R, Moore JL, Swanson KR. Three-dimensional simulation of glioma growth and response to radiation therapy: a case study. Society for Mathematical Biology Annual Meeting, Toronto, Canada, 2008 (SMB)

G Chakraborty, S Gu, **R Rockne**, KR Swanson. Predicting metabolic growth patterns from patient-specific anatomic imaging and mathematical modeling of glioblastomas. International Conference on Mathematical Biology and Annual Meeting of the Society for Mathematical Biology, University of British Columbia, Vancouver 2009 (SMB).

Rockne R, Swanson KR. The role of delay and observation timing in assessing glioma response to radiation therapy. International Conference on Mathematical Biology and Annual Meeting of the Society for Mathematical Biology, University of British Columbia, Vancouver 2009 (SMB)

Gu S, Chakraborty G, **Rockne R**, Swanson KR. Spatiotemporal Pharmacokinetic/Pharmacodynamic Radioactive Tracer and Brain Tumor Modeling: A Method for Generating Patient-specific Simulated PET Images. International Conference on Mathematical Biology and Annual Meeting of the Society for Mathematical Biology, University of British Columbia, Vancouver 2009 (SMB)

Boone A, **Rockne R**, Mrugala MM, Rockhill JK, Alvord EC Jr., Swanson KR. The Clinical Significance of Mathematical Models in the Treatment and Management of Gliomas: A Case Study in Translating Applied Mathematics Research into Clinically Relevant Solutions. International Conference on Mathematical Biology and Annual Meeting of the Society for Mathematical Biology, University of British Columbia, Vancouver 2009.

Szeto M, **Rockne R**, Swanson KR. Anatomic Variation in Quantitative Measures of Glioma Aggressiveness. International Conference on Mathematical Biology and Annual Meeting of the Society for Mathematical Biology, University of British Columbia, Vancouver 2009 (SMB)

Simon M, **Rockne R**, Swanson KR. A comparison between volumetric and localized spatial analysis techniques for assessing model parameters. International Conference on Mathematical Biology and Annual Meeting of the Society for Mathematical Biology, University of British Columbia, Vancouver 2009 (SMB)

Sodt R, **Rockne R**, Swanson KR, Kalet I. Simulation of Anisotropic Growth of Gliomas Using Diffusion Tensor Imaging. International Conference on Mathematical Biology and Annual Meeting of the Society for Mathematical Biology, University of British Columbia, Vancouver, 2009 (SMB)

Swanson KR, Gu S, Chakraborty G, Champley K, Alessio A, Claridge J, **Rockne R**, Muzi M, Krohn K A, Spence A M, Alvord E C Jr., Anderson A R A, Kinahan P. In silico PET imaging: From anatomic glioma growth dynamics to metabolic tumor activity via bio-mathematical modeling. Annual meeting of the Society for Neuro-Oncology. Montreal, Quebec, Canada, 2010. Oxford University Press. Neuro-Oncology **12**(sup IV) 118

Boone A E, **Rockne R**, Mrugala M M, Swanson K R. Pre-treatment glioblastoma proliferation and invasion kinetics: A mechanism to predict pseudoprogression. Annual meeting of the Society for Neuro-Oncology. Montreal, Quebec, Canada, 2010. Oxford University Press. Neuro-Oncology **12**(sup IV) 118

Rockne R, Mrugala M M, Rockhill J K, Swanson K R. Predicting spatial patterns of tumor recurrence following radiation therapy: A hybrid clinical imaging and mathematical modeling approach. Annual meeting of the Society for Neuro-Oncology. Montreal, Quebec, Canada, 2010. Oxford University Press. Neuro-Oncology **12**(sup IV) 111

Rockne R, Swanson K R. Predicting response to radiation therapy and personalized medicine. National Institute for Mathematical and Biological Synthesis, Mathematical Oncology Workshop, 2011 (NIMBioS).

Rockne R, Massey S, Mrugala M M, Anderson A R A, Swanson K R. Response to anti-angiogenic therapy in human brain tumors: the role of the microenvironment and heterogeneity. European Society for Mathematical and Theoretical Biology Tri-Annual Meeting, Krakow, Poland, 2011 (ECMTB)

Swanson K R, Boone A E, **Rockne R,** Mrugala M M. Predicting pseudoprogression in glioblastoma patients: A mathematical and clinical perspective. European Society for Mathematical and Theoretical Biology Tri-Annual Meeting, Krakow, Poland, 2011 (ECMTB)

Holdsworth CH, Corwin D, Stewart R D, **Rockne R**, Swanson K R, Phillips M. Biologically optimized 4D dose distributions for the treatment of incurable glioblastoma. Annual meeting of the American Association of Physicists in Medicine. Vancouver British Columbia, Canada, 2011, (AAPM)

Rockne R, Rockhill J K, Mrugala M M, Swanson K R. Patient-specific virtual radiation oncology: predicting and quantifying treatment response in individual glioblastoma patients. Annual meeting of the American Association of Physicists in Medicine. Vancouver British Columbia, Canada, 2011 (AAPM)

Rockne R, Massey S, Mrugala M M, Anderson A R A, Swanson K R. Response to anti-angiogenic therapy in human brain tumors: the role of the microenvironment and heterogeneity. Casablanca International Workshop in Mathematical Biology: Analysis and Control. Casablanca, Morocco, 2011

Swanson K R, Gu S, Chakraborty G, Champley K, Alessio A, **Rockne R**, Muzi M, Krohn K A, Kinahan P. Predictive simulation of patient-specific [18F]FMISO-PET: Integrating imaging with predictive mathematical models of the tumor microenvironment. Annual Meeting of the Society for Nuclear Medicine, 2011 (SNM) – **Platform Presentation**

Holdsworth C H, Corwin D, Stewart R D, **Rockne R**, Swanson K R, Phillips M. Biologically Optimized 4D Dose Distributions for the Treatment of Incurable Glioblastoma. Annual Meeting of American Association of Physicists in Medicine, 2011 (AAPM)

Rockne R, Rockhill J K, Mrugala M, Swanson K R. Patient-specific virtual radiation oncology: predicting and quantifying treatment response in individual glioblastoma patients. Annual Meeting of American Association of Physicists in Medicine, 2011 (AAPM)

Rockne R, Massey S, Reddell N, LeVeque R J, Swanson K R. Differential chemotaxis of tumor cells in murine gliomas. The 7th International Congress of Industrial and Applied Mathematics, Vancouver British Columbia, Canada, 2011 (ICIAM)

Baldock A, **Rockne R**, Pardakhtim S, Hawkins-Daarud A, Swanson K R. Quantification of uncertainty in a patient-specific model for brain tumor growth. The 7th International Congress of Industrial and Applied Mathematics, Vancouver British Columbia, Canada, 2011 (ICIAM)

Holdsworth C H, Corwin D, Stewart R D, **Rockne R**, Swanson K R, Phillips M. Biologically Optimized 4D Dose Distributions for the Treatment of Incurable Glioblastoma. The 7th International Congress of Industrial and Applied Mathematics, Vancouver British Columbia, Canada, 2011 (ICIAM)

Rockne R, Rockhill J K, Mrugala M, Swanson K R. Patient-specific virtual radiation oncology: novel metrics of response provide a means to stratify patients within a single RTOG RPA class. Annual Meeting of the American Association of Cancer Research, 2011 (AACR)

Swanson K R, **Rockne R**, Holdsworth C H, Corwin D, Stewart R D, Phillips M. Improving Treatment Response by Designing Patient-Specific Optimized Radiation Therapy Dose Distributions Informed by Glioma Proliferation and Invasion Kinetics: A Case Study. Annual Meeting of the Radiological Society of North America, 2011 (RSNA)

Alvord E C, Jr., **Rockne R**, Rockhill J K, Mrugala M M, Rostomily R, Lai A, Cloughesy T, Wardlaw J M, Spence A M, Swanson K R. Know thy enemy: Paradoxes to be exploited in glioblastoma. Annual Meeting of the Society for Neuro-Oncology, 2011 (SNO)

Rockne R, Anderson A R A, Swanson K R. Predictive integration of tumor growth kinetics on clinical imaging with histological features through patient-specific simulation. Annual Meeting of the Society for Neuro-Oncology, 2011 (SNO)

Corwin D, Holdsworth C H, Stewart R D, **Rockne R**, Swanson K R. Patient-Specific Mathematical Radiation Oncology: 4D Optimized Dose Distributions Informed by Glioma Kinetics of Proliferation and Invasion. Annual Meeting of the Society for Neuro-Oncology, 2011 (SNO)

Baldock A, **Rockne R**, Canoll P, Born D, Yagle K, Swanson K R. Cystic Gliomas are Quantitatively Less Biologically Aggressive. Annual Meeting of the Society for Neuro-Oncology, 2011 (SNO)

Neal M L, **Rockne R**, Trister A, Swanson K R. Predicting outcomes following therapy for glioblastoma using response metrics from patient-specific, 3D tumor models. Annual Meeting of the Society for Neuro-Oncology, 2011 (SNO)

R. Rockne, K. Champley, A. Alessio, M. Muzi, K. A. Krohn, P. E. Kinahan, K. R. Swanson. Patient-specific simulations allow prediction of hypoxia and [18F]FMISO-PET in human glioblastoma., University of Washington Medical Center, Seattle, WA. ***Awarded Best Abstract for 2011 Western Regional Society for Nuclear Medicine Annual Meeting**

A. Hawkins-Daarud, **R. Rockne**, M. Muzi, S. Partridge, P. E. Kinahan, K. R. Swanson. Patient-Specific Untreated Virtual Imaging Controls for [18F]-FMISO PET imaging of Glioblastoma, University of Washington Medical Center, Seattle, WA. Annual Meeting of the Society for Nuclear Medicine, 2012 (SNM)

R. Rockne, A. Hawkins-Daarud, M. Muzi, S. Partridge, P. E. Kinahan, K. R. Swanson. Predictive Simulation of MRI and FMISO-PET Imaging Changes During Anti-Angiogenic Therapy for Glioblastomas, University of Washington Medical Center, Seattle, WA. Annual Meeting of the Society for Nuclear Medicine, 2012 (SNM)

P. E. Kinahan **R. Rockne**, A. Hawkins-Daarud, M. Muzi, S. Partridge, K. R. Swanson. Integrating models of cancer biology with advanced PET and MR imaging methods to assess response to therapy. IEEE International Symposium on Biomedical Imaging, Barcelona, Spain 2012 (IEEE)

A. D. Trister, M. L. Neal, T. Cloke, A. L. Baldock, S. Ahn, M. M. Mrugala, J. K. Rockhill**, R. Rockne**, K. R. Swanson. A Novel Metric Of Patient-specific Response To Treatment For Glioblastoma Discriminates Patients With Pseudo-progression. American Society for Radiation Oncology, Boston, MA, 2012 (ASTRO)

S. K. Johnston, C. A. Bridge, **R. Rockne**, L. Guyman, A. Baldock, J. K. Rockhill, M. Mrugala, S. Adair, H-PP. Kiem, K. R Swanson. Enabling the Detection of Treatment Benefit in Novel Therapeutic Studies through Patient-Specific Mathematical Modeling: Analysis of Chemoprotective Hematopoietic Stem Cell Gene Therapy in Human Glioblastomas. Annual Meeting of the Society for Neuro-Oncology, 2012 (SNO)

M. L. Neal, A. D. Trister, S. Ahn, C. Bridge, J. Lange, A. Baldock, **R. Rockne**, M. Mrugala, J. K. Rockhill, A. Lai, T. Cloughesy, K. R. Swanson. A Response Metric Based on a Minimal Model of Glioblastoma Growth is Prognostic for Time to Progression and Overall Survival. Annual Meeting of the Society for Neuro-Oncology, 2012 (SNO)

A. Baldock, S. Ahn, **R. Rockne**, M. Neal, D. Corwin, K. Clark-Swanson, G. Sterin, A. D. Trister, H. Malone, V. Ebiana, A. M. Sonabend, M. Mrugala, J. K. Rockhill, D. L. Silbergeld, A. Lai, T. Cloughesy, G. M. McKhann, J. N. Bruce, R. Rostomily, P. Canoll, K. R. Swanson. Patient-specific invasiveness metric predicts benefit of resection in human gliomas. Annual Meeting of the Society for Neuro-Oncology, 2012 (SNO)

A. Hawkins-Daarud, **R. Rockne**, K. R. Swanson. Interpreting Intensity Modulation on T2/FLAIR Imaging of Gliomas: Deconvolving MR imaging changes from treatment effect through mathematical modeling. Annual Meeting of the Society for Neuro-Oncology, 2012 (SNO)

A. Hawkins-Daarud, A. Baldock, C. Bridge, D. Corwin, J. Rockhill, M. Mrugala, **R. Rockne**, K. R. Swanson. Revealing the diffuse extent of gliomas to enable surgical and radiotherapy treatment design:Insights from a Patient-Specific Mathematical Model and an Untreated Glioblastoma. Annual Meeting of the Society for Neuro-Oncology, 2012 (SNO)

A. L. Baldock, K. Yagle. S. Ahn, D. Born, P. Swanson**, R. Rockne**, K. R. Swanson. Invasion and Proliferation Kinetics Predict IDH-1 Mutation in Contrast-Enhancing Gliomas. Annual Meeting of the Society for Neuro-Oncology, 2012 (SNO) ***Platform Presentation**

D. M. Corwin, C. Holdsworth, R. D. Stewart, **R. Rockne**, K. R. Swanson. Virtual clinical trials: Implications for spatially optimizing radiotherapy using a paitient-specific model of glioma. Annual Meeting of the Society for Neuro-Oncology, 2012 (SNO)

D. M. Corwin, C. Holdsworth, R. D. Stewart, **R. Rockne**, K. R. Swanson. Reducing dose to normal tissue while improving tumor control in human glioblastomas using a patient-specific mathematical and radiotherapy optimization algorithm. Annual Meeting of the Society for Neuro-Oncology, 2012 (SNO)

A. Trister, B. Bot, K. Fontes, C. Bridge, J. K. Rockhill, M. Mrugala**, R. Rockne**, E. Huang, K. R. Swanson. A novel patient-specific model of glioma growth kinetics elucidates underlying biology as measured by gene expression microarray. Annual Meeting of the Society for Neuro-Oncology, 2012 Washington, DC (SNO)

A. Trister, B. Bot, A. Hawkins-Daarud, K. Fontes, C. Bridge, J. K. Rockhill, M. Mrugala, R. Rockne, E. Huang, **K. R. Swanson**. A novel patient-specific model of glioma growth kinetics elucidates underlying biology as measured by gene expression microarray. Markers in Cancer, Hollywood, FL 2012 (MIC) ***Awarded 2012 Conquer Cancer Foundation of ASCO Merit Award**

Rockne R, Champley K, Alessio A, Muzi M, Krohn K A, Kinahan P E, Swanson K R. Patient-specific simulations allow prediction of hypoxia and [18F]FMISO-PET in human glioblastoma., University of Washington Medical Center, Seattle, WA. ***Awarded Best Abstract for 2011 Western Regional Society for Nuclear Medicine** Annual Meeting, 2011 (WRSNM)

D. Corwin. C. Holdsworth, R. D. Stewart, M. Philips, **R. Rockne**, K. R. Swanson. Using patient-specific IMRT optimization and a mathematical model of glioma to improve tumor control and reduce normal tissue complications. Annual Meeting of the Radiation Research Society, Puerto Rico 2012 (RRS)

R. Rockne, M. Mrugala, J. K. Rockhill, K. R. Swanson. Patient-specific mathematical radiation oncology. Annual Meeting of the Radiation Research Society, Puerto Rico 2012 (RRS)

J. E. Adair, B. C. Beard, S. K. Johnston, M. Mrugala, **R. C. Rockne**, K. R. Swanson, H-P. Kiem. Improved chemotherapy efficacy after MGMT(P140K) hematopoietic stem cell gene therapy in poor-prognosis glioblastoma revealed by patient-specific mathematical modeling. American Society of Gene and Cell Therapy, Salt Lake City, UT, 2013 (ASGCT)

S. K. Johnston, J. E. Adair, C A. Bridge, L. Guyman, A. Hawkins-Daarud, **R. C. Rockne**, A. Baldock, J. K. Rockhill, M. M. Mrugala, B. C. Beard, H.-Pr. Kiem, K. R. Swanson Patient-specific mathematical modeling as a precision-medicine approach to evaluating therapeutic gains of a novel chemoprotection treatment in newly-diagnosed glioblastoma. Abstract #111972, 2013 (ASCO)

A. Baldock, **R. C. Rockne**, S. Ahn, M. Neal, D. Corwin, K. Clark-Swanson, G. Sterin, A. D. Trister, H. Malone, A. Sonabend, M. M. Mrugala, J. K. Rockhill, D. L. Silbergeld, A. Lai, T. F. Cloughesy, G. McKhann, J. N. Bruce, R. Rostomily, P. Canoll, K. R. Swanson. Patient-specific biomathematical model predicts benefit of resection in human gliomas. Abstract #116930, 2013 (ASCO)

D. Corwin, **R. C. Rockne**, M. M. Mrugala, J. K. Rockhill, K. R. Swanson. Training and validation cohort analysis for predicting radiation therapy response in human glioblastoma. Abstract #117018, 2013 (ASCO)

A. Hawkins-Daarud, **R. C. Rockne**, P. Kinahan, M. Muzi, A. Alessio, K. A. Krohn, K. R. Swanson. Quantifying the impact of anti-angiogenic therapy on hypoxia and implications for radiation therapy in glioblastoma multiforme with a biomathematical model. Abstract #118015, 2013 (ASCO)

D. Corwin, C. Holdsworth, **R. C. Rockne**, K. R. Swanson. Using a patient-specific mathematical model and an adaptive, evolutionary, optimization algorithm to improve radiotherapy treatment planning for human glioblastoma. Sevilla, Spain, 2013 (Mathways into Cancer II)

R. C. Rockne, K. R. Swanson. Mathematical radiobiology – using patient-specific models to study radiobiology *in vivo*. Sevilla, Spain, 2013 (Mathways into Cancer II)

A. Hawkins-Daarud, **R. C. Rockne**, A. R. A. Anderson, K. R. Swanson. Understanding the impact of anti-angiogenic therapy on the microenvironment and its implications for imaging in glioblastoma multiforme with a mathematical model. Sevilla, Spain, 2013 (Mathways into Cancer II)

R. C. Rockne, J. K. Rockhill, R. Stewart, K. R. Swanson. Using patient-specific models to study radiobiology *in vivo*. American Society for Therapeutic Radiation and Oncology, 2013 (ASTRO)

Graduate Course Work

Applied Linear Analysis, Numerical Methods, Mathematical Ecology, Mathematical Biology, Stochastic Methods, Scientific Computing, Advanced Methods for ODEs, PDEs, Finite Volume Methods, Fluid Mechanics, Optimization, Biomedical Imaging & Contrast Agents, Perturbations and Asymptotic Analysis

Current Research Support

7/01/2009 - 6/30/2014 **NIH R01**
"Novel Tools for Evaluation and Prediction of Radiotherapy Response in Individual Glioma Patients"
PI: *Swanson K R*

9/01/2009 - 8/31/2014 **NIH/NCI Physical Sciences Oncology Center (U54)**
"Integrative Mathematical Oncology"
PD: *Gatenby R* (Moffitt Cancer Center), PI: *Swanson K R*

6/01/2011 - 5/31/2014 **James S. McDonnell Foundation Collaborative Activity Award**
"BONK: Predicting and Controlling Glioma Recurrence: The Role of Heterogeneity and Microenvironment"
MPIs: *Swanson K R , Canoll P (Columbia), Anderson A R A (Moffitt)*

9/27/2011 - 9/31/2016 **NIH R01**
"UVIC: Untreated virtual imaging control"
MPIs: *Swanson K R , Kinahan P*

Student Supervision and Mentoring

High School Students:

Mahlet Assefa	High School Student – Graduated 2010		2008 – 2010
	Awards:	NIH STEP-UP Fellow	
	Currently:	Undergraduate Student – Yale University	
Tyler Rockhill	High School Student – Graduated 2011		2009 – 2012
	Currently:	Undergraduate Student – University of Portland	
April Baldock	High School Student		2011 – 2012

Undergraduate Students:

Gargi Chakraborty	Major:	Biochemistry & Neurobiology	2005 – 2010
	Awards:	Mary Gates Fellow	
		Research for Advanced Undergraduates Fellow	
		NSF VIGRE Fellow	
		MS, Applied Mathematics, 2010 – University of Washington	
	Currently:	Software Developer at Boeing	
Christina Wang	Major:	Bioengineering	2005 – 2009
	Currently:	Medical Student – University of Washington	
Jeffrey Jacobs	Major:	Biology	2005 – 2007
Lily Chau	Major:	Psychology	2005 – 2006
Mindy Szeto	Major:	Biochemistry, Sociology & Biology	2005 – 2010
	Awards:	Mary Gates Fellow (2006, 2008)	

		Amgen Research Summer Scholar (2008)	
		Washington Research Foundation Fellowship (2008)	
		NSF VIGRE Undergraduate Research Fellow (2009)	
Stanley Gu	Major:	Bioengineering	2006 – 2010
	Awards:	Mary Gates Fellow	
		NSF VIGRE Undergraduate Research Fellow (2008, 2009)	
		MS Bioengineering (2010)	
	Currently:	Pfizer	
Kevin Do	Major:	Sociology BS (2010)	2006 – 2010
Rita Sodt	Major:	Computer Science	2006 – 2011
	Awards:	Mary Gates Fellow (2008, 2010)	
		Levinson Emerging Scholars Award (2008)	
		Goldwater Scholarship UW Nominee (2008)	
		Amgen Scholar (2009)	
		BS (2010)	
	Currently:	Graduate Student – Computer Science – Univ of Washington	
Ivan Vulovic	Major:	Computer Science	2006 – 2007
	Currently:	Microsoft	
Julia Moore	Major:	Molecular & Cellular Bio / Applied Math BS (2009)	2007 – 2009
	Awards:	Mary Gates Fellow	
		Amgen Research Scholar	
		NSF VIGRE Fellow	
		Goldwater Scholar	
	Currently:	Graduate Student – UC Davis	
Jennifer Hadley	Major:	Bioengineering	2007
	Awards:	Amgen Research Scholar	
	Currently:	Medical Student at University of Alabama – Birmingham	
Susan Massey	Major:	Mathematics BS(2010)	2007 – Present
	Awards:	**Amgen Research Summer Scholar**	
		AMA Trjitzinsky Award	
		Boeing/OMA Research Scholar	
		McNair Scholar	
		NSF VIGRE Graduate Fellow	
		Individually awarded NSF Graduate Fellowship	
	Currently:	Graduate Student – Applied Mathematics – Univ of Washington	
Shokouh Pardakhtim	Major:	Mathematics / Pre-Med (2010)	2007 – 2010
	Awards:	STAR Scholar	
		NSF VIGRE Fellow	
		McNair Scholar	
Jennifer Beers	Major:	Post-Bac/Pre-Med (2010)	2007 – 2010
	Currently:	Medical Student at University of Washington School of Medicine	
Chunyan Zhou	Major:	Biology (2009)	2007
	Currently:	Grad Student – Environmental Toxicology – Univ. of Washington	
Harkirat Sohi	Major:	Applied Mathematics (MS, 2010)	2008 – 2009
	Awards:	NSF VIGRE Fellow	
		NASA Research Grant	
Brent Sandona	Major:	Computer Engineering	2008 – 2010
Brad Peterson	Major:	Biochemistry	2008
Larissa Miller	Major:	Pre-Bioengineering	2008 – 2009
Amanda Ly	Major:	Chemical Engineering	2008 – 2009

Addie Boone	Major:	Medical Anthropology/Biochemistry	2009 – 2011
	Currently:	Medical Student at Northwestern University School of Medicine	
Samantha Ryder	Major:	Geography/ Pre-Med	2009
Pratyusha Banik	Major:	Biochemistry	2009
Jin Stedge	Major:	Applied Math & Music at MIT	2009
Anne Baldock	Major:	Neurobiology	2009 – Present
	Currently:	Research Scientist (Swanson Lab UW)	
Liz Hanley	Major:	Bioengineering	2009 – 2010
Zinnia Xu	Major:	Bioengineering	2009 – 2010
Kristin DeVleming	Major:	Applied Computational Mathematical Sciences	2009
Gina Tran	Major:	Undeclared	2009
Tyler Cloke	Major:	Computer Science and Engineering	2009 – Present
Greg Sterin	Major:	Computer Science and Engineering	2010 – 2011
Christine Scullywest	Major:	Premed	2010
Misbah Uraizee	Major:	Biology & Mathematics at Yale	2010
Jason Uanon	Major:	Mathematics/Computer Science and Engineering	2010
Alex Kim	Major:	Neurobiology	2010 – 2012
Sam Sussman	Major:	Neurobiology	2010 – 2012
Dillon Eng	Major:	Mechanical Engineering at Rice University	2010
Jessica Forbes	Major:	Mathematics at Carroll College	2010
	Awards:	**Amgen Research Summer Scholar**	
Theresa Kurtz	Major:	Neuroscience/Math at Rochester University	2011
	Awards:	**Amgen Research Summer Scholar**	
Evan Leon	Major:	Computer Science and Engineering	2011 – 2012
	Awards:	NASA Summer Research Scholar	
Jordan Lange	Major:	Computer Science Engineering	2011 – 2012
Aaron Nash	Major:	Computer Science Engineering	2011 – 2012
Kellie Fontes	Major:	Applied Mathematics	2011 – 2012
Chantal Murphy	Major:	Neurobiology, Applied Mathematics	2011 – 2012
Michael Fisher	Major:		2011 – 2012

Graduate Students:

Gargi Chakraborty	Currently: Boeing Research Analyst	MS (2010)
Misha Kutzman		MS (2010)
Susan Massey	Awards: NSF Graduate Fellow (Individually-awarded)	MS (2011)
		PhD (In Process)
Sunyoung Ahn		MS (2011)
David Corwin	Currently: Research Associate (Swanson Lab)	MS (2011)
Dillon Eng		MS (2012)
Josh Jacobs		PhD (2012)

Postdoctoral Fellows:

Maxwell Neal, PhD		2010 – 2012
Kirsten Fagnan, PhD		2010 – 2011
Andrea Hawkins-Daarud, PhD	Awards: NSF Postdoctoral Fellow	2011 – Present
Andrew Trister, MD, PhD	Radiation Oncology Resident	2010 – Present

Medical Students and Residents:

Andrew Trister, MD, PhD	Radiation Oncology Resident	2010 – Present