

CURRICULUM VITAE
D. NEIL HAYES, MD, MS, MPH

Professional Information

D. Neil Hayes, MD, MS, MPH
Assistant Dean for Cancer Research
Scientific Director, UT-West Institute for Cancer Research
Van Vleet Endowed Professor
Department of Medicine, Division of Hematology & Oncology
Department of Genetics, Genomics, and Informatics
Department of Preventive Medicine, College of Medicine
Department of Pathology, College of Medicine
University of Tennessee Health Science Center
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Education

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| Masters of Science: Tufts New England Medical Center. Boston, Massachusetts. Clinical Care Research. | 09/01/2000-02/11/2006 |
| Post-Doctoral Fellow: Dana Farber Cancer Institute. Boston, Massachusetts. Genomics. | 09/01/2002-06/30/2004 |
| Clinical Fellow: Tufts New England Medical Center. Boston, Massachusetts. Hematology/Oncology. | 06/01/2001-06/30/2004 |
| Resident: Boston University School of Medicine. Boston, Massachusetts. Internal Medicine. | 07/01/1997-06/30/2000 |
| Masters of Public Health: Harvard School of Public Health. Boston, Massachusetts. Epidemiology. | 09/01/1996-06/05/1997 |
| Medical Doctorate: University of North Carolina. Chapel Hill, North Carolina. Medicine. | 08/01/1992-05/04/1996 |
| Bachelors of Science: Davidson College. Davidson, North Carolina. Chemistry. | 08/01/1987-05/04/1991 |

Certification:

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| Medical Oncology | 12/31/2005 & 12/31/2015 |
| Internal Medicine | 12/31/2000 MOC |
| Hematology | Board Eligible |

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Professional Experience – Employment History

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|---|-----------------------|
| Professor Department of Medicine, Division of Hematology/Oncology Primary Appointment University of Tennessee Health Science Center Memphis, Tennessee | 07/17/2017-present |
| Scientific Director UT/West Institute for Cancer Research Memphis, Tennessee | 07/17/2017-present |
| Medical Oncologist and Hematologist West Cancer Center Memphis, Tennessee | 07/17/2018-present |
| Professor Department of Pathology & Laboratory Medicine, College of Medicine Joint Appointment University of Tennessee Health Science Center Memphis, Tennessee | 02/01/2018-present |
| Professor Department of Genetics, Genomics, and Informatics Joint Appointment University of Tennessee Health Science Center Memphis, Tennessee | 07/17/2017-present |
| Professor Department of Preventive Medicine, College of Medicine Joint Appointment University of Tennessee Health Science Center Memphis, Tennessee | 07/17/2017-present |
| Adjunct Professor Department of Computational Biology, St Jude Children's Research Hospital Joint Appointment University of Tennessee Health Science Center Memphis, Tennessee | 07/17/2017-present |
| Professor Department of Medicine, Division of Hematology/Oncology Primary Appointment University of North Carolina Chapel Hill, North Carolina | 06/01/2017-07/16/2017 |
| Professor Department of Otolaryngology/Head and Neck Cancer Surgery Joint Appointment University of North Carolina Chapel Hill, North Carolina | 06/01/2017-07/16/2017 |
| Co-Leader of UNC Lineberger Clinical Research Program Lineberger Comprehensive Cancer Center University of North Carolina Chapel Hill, North Carolina | 01/01/2013-07/16/2017 |

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| Associate Professor Department of Medicine, Division of Hematology/Oncology Primary Appointment University of North Carolina Chapel Hill, North Carolina | 01/01/2010-05/31/2017 |
| Associate Professor Department of Otolaryngology/Head and Neck Cancer Surgery Joint Appointment University of North Carolina Chapel Hill, North Carolina | 01/01/2010-05/31/2017 |
| Director of Clinical Bioinformatics Lineberger Comprehensive Cancer Center University of North Carolina Chapel Hill, North Carolina | 01/01/2006-07/16/2017 |
| Director of Chapel Hill Tumor Registry University of North Carolina Chapel Hill, North Carolina | 01/01/2006-12/31/2011 |
| Assistant Professor Department of Otolaryngology/Head and Neck Cancer Surgery Joint Appointment University of North Carolina Chapel Hill, North Carolina | 01/01/2009-12/31/2010 |
| Assistant Professor Department of Medicine, Division of Hematology/Oncology University of North Carolina Chapel Hill, North Carolina | 01/01/2004-12/31/2010 |
| Clinical Care Research Fellow Tufts New England Medical Center Boston, Massachusetts | 01/01/2001-12/31/2004 |
| Instructor and Fellow Hematology/Oncology Tufts New England Medical Center Boston, Massachusetts | 01/01/2001-12/31/2004 |
| Teaching Associate Intern and Resident, Internal Medicine Boston University School of Medicine Boston, Massachusetts | 09/01/1996-12/31/2000 |
| High School English Teacher Le Mans, France | 08/01/1991-06/30/1992 |

Awards, Honors, and Recognition

American Society for Clinical Investigation, elected in 2013.

1st Place Clinical/Translational Research Prize: Characteristics Affecting Inter Observer Reproducibility in Morphologic Diagnoses of Non-Small Cell Lung Cancer Subtypes. Lineberger Comprehensive Cancer Center, University of North Carolina at Chapel Hill, NC. Project Mentor, May 2009.

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2nd Place Clinical/Translational Research Prize: p16INK4a Over-Expression is Associated with Improved Outcomes in Young patients with Squamous Cell Cancers of the Oral Tongue. Lineberger Comprehensive Cancer Center, University of North Carolina at Chapel Hill, NC. Project Mentor, May 2009.

Village Pride Award, WCHL, Chapel Hill, NC. February 5, 2008.

Translational Research Prize: Lineberger Comprehensive Cancer Center, University of North Carolina at Chapel Hill, NC, 2006.

Clinical and Translational Research Award: Lineberger Comprehensive Cancer Center, University of North Carolina at Chapel Hill, NC, 2005.

Young Investigator Fellowship, Kern Aspen Lipid Conference, Aspen, CO, 2003.

Young Investigator Award, American Society of Clinical Oncology, Chicago, IL, 2003.

Young Investigator Award, Eastern Cooperative Oncology Group, Miami FL, 2002.

Best Student Research, Injury Control. American Public Health Association, Atlanta, GA, 2001.

1st Place for Original Research, American College of Physicians/Society of Internal Medicine, Massachusetts Statewide Competition, MA, 1999.

University-Sponsored Tuition Grant, Harvard School of Public Health, Boston, MA, 1997.

Daniel T. Young Peace and Social Justice Award. University of North Carolina School of Medicine, Chapel Hill, NC, 1996.

Order of the Fleece, University of North Carolina at Chapel Hill. Membership by Professor Nomination. Chapel Hill, NC, 1996.

Bibliography

Book and Chapters

Huang H, Liu Y, **Hayes DN**, Nobel A, Marron JS, Henning C. 2015. Significance Testing in Clustering. In: Henning C, Meila M, Murtagh F, Rocci R, editors. *Handbook of Cluster Analysis. Handbooks of Modern Statistical Methods*. Chapman & Hall/CRC. p. 315-336.

Walter V, Nobel AB, **Hayes DN**, Wright FA. 2013. Identification of Recurrent DNA Copy Number Aberrations in Tumors. In: Dehmer M, Emmert-Streib F, editors. *Statistical Diagnostics for Cancer: Analyzing High-Dimensional Data*. Weinheim (Germany): Wiley-Blackwell Press. p. 241-260.

Hayes DN, Meyerson M. 2004. Microarray Approaches to Gene Expression Analysis. In: Coleman WB, Tsongalis GJ, editors. *Molecular Diagnostics for the Clinical Laboratorian*. 2nd ed. Totowa (NJ): Humana Press. p. 121-148.

Refereed Publications-Original Research

Julie George, Vonn Walter, Martin Peifer, Ludmil Alexandrov, Tiffany Delhomme, Maude Ardin, Danila Seidel, Frauke Leenders, Noemie Leblay, Graham Byrnes, Ruping Sun, Christian Müller, Ilona Dahmen, Graziella Bosco, Florian Malchers, Aurélien de Reyniès, Anne McLeer-Florin, Roopika Menon, Janine Altmueller, Christian Becker, Peter Nuernberg, Viktor Achter, Ulrich Lang, Peter Schneider, Magdalena Bogus, Matthew Soloway, Matthew Wilkerson, Yupeng Cun, James McKay, Denis Moro-Sibilot, Christian Brambilla, Sylvie Lantejoul, Nicolas Lemaitre, Alex Soltermann, Walter Weder, Odd Terje Brustugun, Marius Lund-Iversen, Aslaug Helland, Steinar Solberg, Sascha Ansen, Gavin Wright, Benjamin Solomon, Luca Roz, Ugo Pastorino, Iver Petersen, Joachim Clement, Jörg Sängler, Jürgen Wolf, Martin Vingron, Thomas Zander, Sven Perner, William Travis, Stefan Haas,

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Magali Olivier, Matthieu Foll, Reinhard Büttner, **David Hayes**, Elisabeth Brambilla, Lynnette Fernandez-Cuesta, Roman Thomas, Lukas Maas, and Verena Tischler. Integrative genomic profiling of large-cell neuroendocrine carcinomas reveals distinct subtypes of high-grade neuroendocrine lung tumors. *Nature Communications*. 2018 Mar 13. doi: [doi:10.1038/s41467-018-03099-x](https://doi.org/10.1038/s41467-018-03099-x). Article number: [1048 \(2018\)](https://doi.org/10.1038/s41467-018-03099-x)

Sun W, Bunn P, Jin C, Little P, Zhabotynsky V, Perou CM, **Hayes DN**, Chen M, Lin DY. The association between copy number aberration, DNA methylation and gene expression in tumor samples. *Nucleic Acids Res*. 2018 Feb 26. doi: [10.1093/nar/gky131](https://doi.org/10.1093/nar/gky131). PubMed PMID: [29529299](https://pubmed.ncbi.nlm.nih.gov/29529299/)

Radovich M, Pickering CR, Felau I, Ha G, Zhang H, Jo H, Hoadley KA, Anur P, Zhang J, McLellan M, Bowlby R, Matthew T, Danilova L, Hegde AM, Kim J, Leiserson MDM, Sethi G, Lu C, Ryan M, Su X, Cherniack AD, Robertson G, Akbani R, Spellman P, Weinstein JN, **Hayes DN**, Raphael B, Lichtenberg T, Leraas K, Zenklusen JC; Cancer Genome Atlas Network, Fujimoto J, Scapulatempo-Neto C, Moreira AL, Hwang D, Huang J, Marino M, Korst R, Giaccone G, Gokmen-Polar Y, Badve S, Rajan A, Ströbel P, Girard N, Tsao MS, Marx A, Tsao AS, Loehrer PJ. The Integrated Genomic Landscape of Thymic Epithelial Tumors. *Cancer Cell*. 2018 Feb 12;33(2):244-258.e10. doi: [10.1016/j.ccell.2018.01.003](https://doi.org/10.1016/j.ccell.2018.01.003). PMID: [29438696](https://pubmed.ncbi.nlm.nih.gov/29438696/)

Montgomery ND, Selitsky SR, Patel NM, **Hayes DN**, Parker JS, Weck KE. Identification of Germline Variants in Tumor Genomic Sequencing Analysis. *J Mol Diagn*. 2018 Jan;20(1):123-125. doi: [10.1016/j.jmoldx.2017.09.008](https://doi.org/10.1016/j.jmoldx.2017.09.008). PMID: [29249243](https://pubmed.ncbi.nlm.nih.gov/29249243/)

Patel NM, Michelini VV, Snell JM, Balu S, Hoyle AP, Parker JS, Hayward MC, Eberhard DA, Salazar AH, McNeillie P, Xu J, Huettner CS, Koyama T, Utro F, Rhrissorakrai K, Norel R, Bilal E, Royyuru A, Parida L, Earp HS, Grilley-Olson JE, **Hayes DN**, Harvey SJ, Sharpless NE, Kim WY. Enhancing Next-Generation Sequencing-Guided Cancer Care Through Cognitive Computing. *Oncologist*. 2017 Nov 20. pii: [theoncologist.2017-0170](https://doi.org/10.1634/theoncologist.2017-0170). doi: [10.1634/theoncologist.2017-0170](https://doi.org/10.1634/theoncologist.2017-0170). PMID: [29158372](https://pubmed.ncbi.nlm.nih.gov/29158372/)

Abeshouse A, Adebamowo C, Adebamowo SN, Akbani R, Akeredolu T, Ally A, Anderson ML, Anur P, Appelbaum EL, Armenia J, Auman JT, Bailey MH, Baker L, Balasundaram M, Balu S, Barthel FP, Bartlett J, Baylin SB, Behera M, Belyaev D, Bennett J, Benz C, Beroukhir R, Birrer M, Bocklage T, Bodenheimer T, Boice L, Bootwalla MS, Bowen J, Bowlby R, Boyd J, Brohl AS, Brooks D, Byers L, Carlsen R, Castro P, Chen HW, Cherniack AD, Chibon F, Chin L, Cho J, Chuah E, Chudamani S, Cibulskis C, Cooper LAD, Cope L, Cordes MG, Crain D, Curley E, Danilova L, Dao F, Davis IJ, Davis LE, Defreitas T, Delman K, Demchok JA, Demetri GD, Demicco EG, Dhalla N, Diao L, Ding L, DiSaia P, Dottino P, Doyle LA, Drill E, Dubina M, Eschbacher J, Fedosenko K, Felau I, Ferguson ML, Frazer S, Fronick CC, Fulidou V, Fulton LA, Fulton RS, Gabriel SB, Gao J, Gao Q, Gardner J, Gastier-Foster JM, Gay CM, Gehlenborg N, Gerken M, Getz G, Godwin AK, Godwin EM, Gordienko E, Grilley-Olson JE, Gutman DA, Gutmann DH, **Hayes DN**, Hegde AM, Heiman DI, Heins Z, Helsel C, Hepperla AJ, Higgins K, Hoadley KA, Hobensack S, Holt RA, Hoon DB, Hornick JL, Hoyle AP, Hu X, Huang M, Hutter CM, Iacocca M, Ingram DR, Ittmann M, Iype L, Jefferys SR, Jones KB, Jones CD, Jones SJM, Kalir T, Karlan BY, Karseladze A, Kasaian K, Kim J, Kundra R, Kuo H, Ladanyi M, Lai PH, Laird PW, Larsson E, Lawrence MS, Lazar AJ, Lee S, Lee D, Lehmann KV, Leraas KM, Lester J, Levine DA, Li I, Lichtenberg TM, Lin P, Liu J, Liu W, Liu EM, Lolla L, Lu Y, Ma Y, Madan R, Maglinte DT, Magliocco A, Maki RG, Mallery D, Manikhas G, Mardis ER, Mariamidze A, Marra MA, Martignetti JA, Martinez C, Mayo M, McLellan MD, Meier S, Meng S, Meyerson M, Mieczkowski PA, Miller CA, Mills GB, Moore RA, Morris S, Mose LE, Mozgovoy E, Mungall AJ, Mungall K, Nalisnik M, Naresh R, Newton Y, Noble MS, Novak JE, Ochoa A, Olvera N, Owonikoko TK, Paklina O, Parfitt J, Parker JS, Pastore A, Paulauskis J, Penny R, Pereira E, Perou CM, Perou AH, Pihl T, Pollock RE, Potapova O, Radenbaugh AJ, Ramalingam SS, Ramirez NC, Rathmell WK, Raut CP, Riedel RF, Reilly C, Reynolds SM, Roach J, Robertson AG, Roszik J, Rubin BP, Sadeghi S, Saksena G, Salner A, Sanchez-Vega F, Sander C, Schein JE, Schmidt HK, Schultz N, Schumacher SE, Sekhon H, Senbabaoglu Y, Setdikova G, Shelton C, Shelton T, Shen R, Shi Y, Shih J, Shmulevich I, Sica GL, Simons JV, Singer S, Sipahimalani P, Skelly T, Socci N, Sofia HJ, Soloway MG, Spellman P, Sun Q, Swanson P, Tam A, Tan D, Tarnuzzer R, Thiessen N, Thompson E, Thorne LB, Tong P, Torres KE, van de Rijn M, Van Den Berg DJ, Van Tine BA, Veluvolu U, Verhaak R, Voet D, Voronina O, Wan Y, Wang Z, Wang J, Weinstein JN, Weisenberger DJ, Wilkerson MD, Wilson RK, Wise L, Wong T, Wong W, Wrangle J, Wu Y, Wyczalkowski M, Yang L, Yau C, Yellapantula V, Zenklusen JC, Zhang JJ, Zhang H, Zhang

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George J, Cannon T, Lai V, Richey L, Zanation A, **Hayes DN**, Shores C, Guttridge D, Couch M. Cancer Cachexia Syndrome in Head and Neck Cancer Patients: Part II: Pathophysiology. *Head Neck*. 2007 May; 29(5):497-507. PMID: [17390378](#).

Couch M, Lai V, Cannon T, Guttridge D, Zanation A, George J, **Hayes DN**, Zeisel S, Shores CI. Cancer Cachexia Syndrome in Head and Neck Cancer Patients: Part I. Diagnosis, Impact on Quality of Life and Survival, and Treatment. *Head Neck*. 2007 Apr; 29(4):401-11. PMID: [17285641](#).

Socinski MA, Stinchcombe TE, **Hayes DN**, Morris DE. The Emergence of a Unique Population in Non-Small Cell Lung Cancer: Systemic or Loco-Regional Relapse Following Postoperative Adjuvant Platinum-Based Chemotherapy. *Semin Oncol*. 2006 Feb; 33(1 Suppl 1):S32-8. PMID: [16472707](#).

Socinski MA, Stinchcombe TE, **Hayes DN**. The Evolving Role of Pemetrexed (Alimta) in Lung Cancer. *Semin Oncol*. 2005 Apr; 32(2 Suppl 2):S16-22. PMID: [15818533](#).

Published Abstracts and Poster Presentations

Faruki H, Mayhew G, **Hayes DN**, Serody JS, Perou CM, Lai-Goldman M. Abstract Title: Immune cell activation among lung adenocarcinoma and squamous cell carcinoma intrinsic subtypes and CD274 (PD-L1) expression. Poster Session: Developmental Therapeutics-Immunotherapy, ASCO 2016 Annual Meeting. Chicago, IL, June 3-7, 2016.

Roque DR, Castellano T, **Hayes DN**, Dizon AM, Clark LH, Pierce S, Wysham WZ, Gehrig PA, Bae-Jump VL. Genetic variations in endometrial cancer by histology, stage and BMI. Poster Session: Gynecologic Cancer, ASCO 2016 Annual Meeting. Chicago, IL, June 3-7, 2016.

Moschos SJ, Zhao X, **Hayes DN**. Analysis of the University of North Carolina (UNC) and the Cancer Genome Atlas Project (TCGA) next generation sequencing (NGS) datasets to identify somatic mutations (SM) with prognostic significance in cutaneous melanoma (CM). Poster Session, Melanoma/Skin Cancers. American Society of Clinical Oncology (ASCO) Annual Meeting 2016. Chicago, IL. June 3-7, 2016.

Chera BS, Amdur RJ, Tepper JE, Green RL, Qaqish BF, **Hayes DN**, Weissler MC, Weiss J, Hackman T, Zanation AM, Patel S, Zevallos J, Grilley-Olson JE, Funkhouser WK, Sheets NC, Mendenhall WM. A Prospective Phase II Trial of De-Intensified Chemoradiotherapy for Low-Risk HPV-Associated Oropharyngeal Squamous Cell Carcinoma. (Abstract #6004). Oral Abstract Session, Head and Neck Cancer. American Society of Clinical Oncology (ASCO) Annual Meeting 2015. Chicago, IL. May 29-June 2, 2015.

Mak MP, Diao L, Tong P, Wang J, Ng PK, Cardnell R, **Hayes DN**, Robertson G, Myers J, El-Naggar AK, William WN, Coombes KR, Weinstein JN, Mills GB, Heymach J, Gibbons DL, Byers LA. Enriched Expression of PD-L1 and other Immune Targets after Epithelial-Mesenchymal Transition (EMT) in Squamous Head and Neck and Lung

CURRICULUM VITAE
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Cancers. (Abstract #6016). Poster Discussion Session, Head and Neck Cancer. American Society of Clinical Oncology (ASCO) Annual Meeting 2015. Chicago, IL. May 29-June 2, 2015.

Weiss J, Gilbert J, Grilley-Olson JE, Deal AM, Chera BS, Liao JJ, Murphy BA, Weissler MC, **Hayes DN**. Response Rates, Toxicity, and Quality of Life for Locally Regionally Advanced Head and Neck Squamous Cell Carcinoma after Induction Chemotherapy with Weekly Nab-Paclitaxel, Carboplatin, and Cetuximab. (Abstract #6030). American Society of Clinical Oncology (ASCO) Annual Meeting 2015. Chicago IL. May 29-June 2, 2015.

Jeck W, Roque DR, **Hayes DN**, Dizon AM, Clark LH, Pierce S, Wysham WZ, Gehrig PA, Bae Jump VL. Frequency of Multiple PIK3CA and PK3R1 Concurrent Mutations in Endometrial Cancers. (Abstract #e16522). American Society of Clinical Oncology (ASCO) Annual Meeting 2015. Chicago, IL. May 29-June 2, 2015.

Moschos SJ, Zhao X, Liu W, Trembath DG, Krauze MT, Long GV, Sivalingham B, Scolyer RA, Kirkwood JM, Hamilton RL, **Hayes DN**, Sharpless NE. Whole Exome Paraffin Sequencing (WEPS) of Same Patient (pt) Primary, Extracranial, and Melanoma Brain Metastases (PEB) to identify New Driver and Clonal Evolution Genetic Events. (Abstract #e20033). American Society of Clinical Oncology (ASCO) Annual Meeting 2015. May 29-June 2, 2015.

Migliarese MR, Wilkerson M, Fan C, Faruki H, **Hayes DN**, Perou CM, Lai-Goldman M. Evaluation of a lung cancer RNA expression subtyping panel and comparison with histologic diagnosis in lung tumor samples from multiple data sets including The Cancer Genome Atlas (TCGA). (Abstract #7566) American Society of Clinical Oncology Annual Meeting. June 3, 2014.

Jo H, Patel NM, Weck KE, Eberhard DA, **Hayes DN**, Parker JS, Hayward MC, Salazar A, Grilley-Olson JE. Correlating Molecular and Histopathologic Tumor Purity: An Analysis of 816 Patients. American Association for Cancer Research Annual Meeting. Washington, D.C. April 9, 2014.

Walter V, Du Y, Yin X, Sun W, Wilkerson MD, Hayward MC, Salazar AH, Perou CM, **Hayes DN**. Integrated Analysis of Squamous Tumors Identifies Novel Targets and Dissects Gene Regulation. American Association for Cancer Research Annual Meeting. Washington, D.C. April 9, 2014.

Gross AM, Orosco RK, Shen JP, Egloff AM, Carter H, Hoffree M, Choueiri M, Coffey CS, Lippman SM, **Hayes DN**, Cohen E, Grandis J, Nguyen QT, Ideker T. A Prognostic Model of Head and Neck Cancer Ties TP53 Mutation to 3p Loss. American Association for Cancer Research Annual Meeting. Washington, D.C. April 8, 2014.

Um SW, Xiao PJ, **Hayes DN**, Kim, WY, Randell SH. Third Hit Genetic Changes and Clonal Heterogeneity in a Genetically Engineered Mouse Lung Cancer Model. American Association for Cancer Research Annual Meeting. Washington, D.C. April 6, 2014.

Wilkerson M, Lai-Goldman M, Bernard PS, Perou CM, **Hayes DN**, Grilley-Olson JE. Reproducible Molecular Characterization of Non-Small Cell Lung Cancer from Paraffin. (Abstract #7576). American Society of Clinical Oncology Annual Meeting. Chicago, IL. May 30, 2013.

Chera BS, Qaqish BF, Weissler MC, **Hayes DN**, Shores CG, Monroe A, Anderson RF, Wu J, Grilley-Olson JE, Weiss J, Hackman T, Zanation AM, Mendenhall WM, Amdur RJ. Phase II Study of De-Intensification of Radiation and Chemotherapy for Low-Risk HPV-Related Oropharyngeal Squamous Cell Carcinoma. (Abstract #TPS6097). American Society of Clinical Oncology Annual Meeting. Chicago, IL. May 30, 2013.

Weiss J, **Hayes DN**, Algazy KM, Sesai AS, Horn B, Gulino S, Flowers D, Frazee D, Feldman AM, Staddon AP, Grilley-Olson JE, Cohen RB Langer CJ. Combination Lapatinitib and Capecitabine in Advanced, Incurable Squamous Cell Carcinoma of the Head and Neck (SCCHN). (Abstract #6094). American Society of Clinical Oncology Annual Meeting. Chicago, IL. May 30, 2013.

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Gilbert J, Schell MJ, Zhao X, Murphy BA, Tanveyanon T, **Hayes DN**, Haigentz M, Saba NF, Nieva JJ, Perez J, Bishop JA, Chung CH. Cetuximab with or without Sorafenib in Recurrent/Metastatic (R/M) Squamous Cell Carcinoma of the Head and Neck (SCCHN). (Abstract #6047). American Society of Clinical Oncology Annual Meeting. Chicago, IL. May 30, 2013.

Wong SJ, Cohen E, Karrison T, **Hayes DN**, Kies MS, Cullen KJ, Tanveyanon T, Argiris Takebe N, Lim D, Saba NF, Worden FP, Gilbert J, Lenz HJ, Razak A, Roberts J, Vokes E. A Phase II Study of Dasatinib (BMS 354825) in Recurrent or Metastatic ckit-Expressing Adenoid Cystic (ACC) and Non-ACC Malignant Salivary Glands Tumors (MSGT). (Abstract # 6022). American Society of Clinical Oncology Annual Meeting. Chicago, IL. May 30, 2013.

Hayes DN, Grandis J, El-Naggar AK. Comprehensive Genomic Characterization of Squamous Cell Carcinoma of the Head and Neck in the Cancer Genome Atlas. (Abstract #6009). American Association for Cancer Research Annual Meeting. Washington, D.C. April 6-10, 2013.

VanderWalde NA, Meyer AM, Tyree SD, Zullig LL, Carpenter WR, Weissler MC, Shores CG, **Hayes DN**, Chera BS. Patterns of Care in Elderly Patients with Squamous Cell Carcinoma of the Head and Neck: A SEER-Medicare Analysis. (Abstract #5539). Head and Neck Cancer Oral Session. American Society of Clinical Oncology Annual Meeting. Chicago, IL. June 1-5, 2012.

Moye VA, Chandramouleeswaran S, Zhao N, Muss H, Weissler MC, Brossoie SM, Hayward MC, **Hayes DN**. The Impact of Advanced Age on Outcomes in Squamous Cell Carcinoma of the Head and Neck. (Abstract #5577). Head and Neck Cancer Oral Session. American Society of Clinical Oncology Annual Meeting. Chicago, IL. June 1-5, 2012.

Hayes DN, Peng G, Pennella E, Carter GC, Muehlenbein CE, Covello KL, Corral M, Obasaju C. Longitudinal Oncology Registry of Head and Neck carcinoma (LORHAN): Analysis of African American Patients. (Abstract #5533). Head and Neck Cancer Oral Session. American Society of Clinical Oncology Annual Meeting. Chicago, IL. June 1-5, 2012.

Martins R, Parvathaneni P, Sharma AK, Raez LE, Papagikos MA, Yunus F, Bauman JE, Eaton KD, Liao JJ, Mendez E, Futran N, Kurland BF, Wang DX, Xiaoyu S, Wallace SG, **Hayes DN**. Randomized Phase II Trial of Cisplatin and Radiotherapy with or without Erlotinib in Patients with Locally Advanced Squamous Cell Carcinoma of the Head and Neck (SCCHN). (Abstract #5503). NSCLC Lung Cancer Oral Session. American Society of Clinical Oncology Annual Meeting. Chicago, IL. June 1-5, 2012.

Govindan R, Hammerman PS, **Hayes DN**, Wilkerson MD, Baylin S, Meyerson M, on behalf of the Cancer Genome Atlas (TCGA) Group. Comprehensive Genomic Characterization of Squamous Cell Carcinoma of the Lung. (Abstract #7006). Poster Discussion Session. American Society of Clinical Oncology Annual Meeting. Chicago, IL. June 1-5, 2012.

Austin M, Schmidt R, Parvathaneni U, Bauman JE, **Hayes DN**, Papagikos MA, Eaton KD, Liao JJ, Mendez E, Kurland BF, Xiaoyu S, Wallace SG, Martins R. Expression of p16, ERCC1, and EGFR Amplification as Predictors of Responsiveness of Locally Advanced Squamous Cell Carcinomas of Head and Neck (SCCHN) to Cisplatin, Radiotherapy, and Erlotinib: A Phase II Randomized Trial. (Abstract #5515). American Society of Clinical Oncology Annual Meeting. Chicago, IL. June 1-5, 2012.

Wilkerson MD, Randell SH, **Hayes DN**. International Association for the Study of Lung Cancer Joint Conference on Molecular Origins of Lung Cancer: Biology, Therapy and Personalized Medicine. The American Association for Cancer Research. Invited. San Diego, CA. January 8-11, 2012.

Wilkerson MD, **Hayes DN**. Sequence Mutations, Transcript Isoforms, and Concurrent Gene Alterations in Lung Cancer. Keystone Symposia Conference: Changing Landscape of the Cancer Genome. June 22, 2011.

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Lucas AS, Wilkerson MD, Roberts PJ, Hayward MC, Grilley-Olson JE, Stinchcombe T, Socinski MA, Veeramachaneni NK, Haithcock BE, Funkhouser WK, **Hayes DN**. Immunohistochemical-Based Diagnosis of Lung Adenocarcinoma Subtypes Reproduces the Results of Gene Expression Profiling. (Abstract #e21079). American Society of Clinical Oncology Annual Meeting. Chicago, IL. June 3-7, 2011.

Murphy A, Chen AY, Curran Jr WJ, Garden AS, Harari PM, Wong SJ, Bellm LA, Schwartz M, Newman J, Adkins D, **Hayes DN**, Parvathaneni U, Brachman D, Ghabach B, Schneider C, Greenberg M, Abitbol A, Anne PR, Ang K. Longitudinal Oncology Registry of Head and Neck carcinoma (LORHAN): Analysis of Disparities in Care. (Abstract #5533). American Society of Clinical Oncology Annual Meeting. Chicago, IL. June 3-7, 2011.

Hayes DN, Zhao N, Ang M, Patel M, Wilkerson MD, Yin X, Hayward MC, Funkhouser Jr WK, Olshan A. Different Cellular p16 Localization may Signal Different Survival Outcomes in Head and Neck Cancer. (Abstract #5572). American Society of Clinical Oncology Annual Meeting. Published abstract and poster. Chicago, IL. June 3-7, 2011.

Walter VA, Wilkerson MD, Cabanski D, Du Y, Hayward MC, Hill AM, Soloway M, Yin XY, Zhao N, Wright FA, **Hayes DN**. Integrated Genomic Analysis of Head and Neck Cancer Reveals Focal High-Level Copy Number Gains in Chr11q13 Associated with Increased Expression of Known Regional Oncogenes. American Association for Cancer Research Annual Meeting. Orlando FL. April 2-6, 2011.

Wilkerson MD, Yin X, Hayward MC, Veeramachaneni NK, Haithcock BE, Funkhouser WK, Thorne L, Miller CR, Randell SR, **Hayes DN**. Lung Cancer Patients Exhibit a Genomewide Chromosomal Instability and DNA Methylation Correlation which Varies by Expression Subtype. American Association for Cancer Research Annual Meeting. Orlando FL. April 2-6, 2011.

Lucas AS, Cohen EE, Cohen RB, Krzyzanowska MK, Chung CH, Murphy BA, Tanvetyanon T, Gilbert J, Moore GDT, **Hayes DN**. Phase II Study and Tissue Correlative Studies of AZD6244 (ARRY-142886) in Iodine-131 Refractory Papillary Thyroid Carcinoma (IRPTC) and Papillary Thyroid Carcinoma (PTC) with Follicular Elements. American Society of Clinical Oncology Annual Meeting. Published abstract and poster presentation. Chicago, IL. June 4-8, 2010.

Hayes DN, Raez LE, Sharma AK, Papagikos MA, Yunus F, Parvathaneni U, Eaton KD, Futran N, Wallace SG, Martins R. Multicenter Randomized Phase II Trial of Combined Radiotherapy and Cisplatin with or without Erlotinib in Patients with Locally Advanced Squamous Cell Carcinoma of the Head and Neck (SCCAHN): Preliminary Toxicity Results. American Society of Clinical Oncology Annual Meeting. Published abstract and poster presentation. (Abstract #5580). Chicago, IL. June 4-8, 2010.

Ang M, Zhao N, Hayward M, Patel M, Yin X, Wilkerson MD, Funkhouser Jr. WK, Fritchie K, Olshan A, **Hayes DN**. Expression and Prognostic Significance of X-Ray Crosscomplementation Group 1 (XRCC1) in Head and Neck Squamous Cell Carcinoma Patients Undergoing Concurrent Chemoradiation. American Society of Clinical Oncology Annual Meeting. Published abstract and poster presentation. Chicago, IL. June 4-8, 2010.

Wilkerson MD, Yin X, Hayward MC, Funkhouser WK, Thorne L, Parsons AM, Miller CR, Socinski MA, Bernard PS, Perou CM, **Hayes DN**. Lung Adenocarcinoma Subtypes have Unique Gene Mutations (EGFR, TP53), DNA Copy Number Alterations (3q26, 16p13), and Patient Smoking Histories. American Association of Cancer Research Annual Meeting. Washington, D.C. April 17-21, 2010.

Tran TN, Ray GT, Saddier P, Trigg M, **Hayes DN**, Li Y, Rizzieri D, Stein A, Weber D, Serody J, Raasch R, Habel L. Immunocompromised Status of Patients with Hematologic and Solid Tumor Malignancies: Construction of a Practical Algorithm. American Society of Hematology, Annual Meeting. New Orleans, LA. December 5-8, 2009.

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D. NEIL HAYES, MD, MS, MPH

Grilley-Olson JE, **Hayes DN**, Socinski MA, Moore DT, Qaqish BF, Leslie KO, Travis WD, Funkhouser WK, and the VOILA Group. Characteristics Affecting Inter-Observer Reproducibility in Morphologic Diagnoses of Non-Small Cell Lung Cancer (NSCLC) Subtypes. International Association for the Study of Lung Cancer. 13th World Conference on Lung Cancer. San Francisco, CA. July 31-August 4, 2009.

Funkhouser WK, Grilley-Olson JE, Qaqish BF, Moore DT, Travis WD, Leslie KO, **Hayes DN**, and the VOILA Group. Inter-Observer Reproducibility for the v.4 WHO Classification of NSCLC. Pulmonary Pathology Society Annual Meeting. Portland, OR. June 24-26, 2009.

Grilley-Olson JE, **Hayes DN**, Miller CR, Socinski MA, Stinchcombe TE, Hayward MC, Qaqish BF, Moore DT, Funkhouser WK. Inter-Observer Reliability for the Diagnosis of Lung Cancer in a Clinical Cohort Using the WHO Classification System, Version 3. American Society of Clinical Oncology Annual Meeting. Orlando, FL. May 28-June 2, 2009.

Hayes DN, Lee C, Hayward M, Socinski MA, Stinchcombe T, Roberts P, et al. Molecular Markers Distinguish Patients at Differential Risk of Brain Metastases in Lung Cancer by Immunohistochemistry. American Society of Clinical Oncology Annual Meeting. Chicago, IL. May 30-June 3, 2008.

Grilley-Olson JE, **Hayes DN**, Miller CR, Socinski MA, Stinchcombe TE, Hayward MC, Qaqish BF, Moore DT, Funkhouser WK. Inter-Observer Reliability for the Diagnosis of Lung Cancer in a Clinical Cohort Using the WHO Classification System, version 3. American Society of Clinical Oncology Annual Meeting. Chicago, IL. May 30-June 3, 2008.

Stinchcombe TE, Lee CB, **Hayes DN**, Choksi J, Allred T, Guliano S, Qaqish BF, Socinski MA. Preliminary Safety and Efficacy Data of a Phase II Trial of Vinflunine and Cetuximab in the Second-Line Treatment of Patients with Advanced Non-Small Cell Lung Cancer. American Society of Clinical Oncology Annual Meeting. Chicago, IL. May 30-June 3, 2008.

Qi Y, Hoadley K, Perou CM, **Hayes DN**. Parallel MicroRNA and Gene Expression Profiling of Human Glioblastomas. American Association of Cancer Research Annual Meeting. San Diego, CA. April 14, 2008.

Gainor L, Parsons AM, Parker AL, Detterbeck FC, **Hayes DN**. Predictive Model for Mediastinal Lymph Node Status at the Time of Mediastinoscopy. American Society of Clinical Oncology Annual Meeting. Chicago, IL. June 1-5, 2007.

Hayes DN, Schallheim J, Roberts P, et al. Paraffin-Based Molecular Diagnosis of Lung Cancer Reproduces Morphologic and Molecular Subtypes of Lung Cancer. American Society of Clinical Oncology Annual Meeting. Chicago, IL. June 1-5, 2007.

Allen RM, Goldberg RM, Berlin J, Spigel D, Stinchcombe TE, Sanoff HK, **Hayes DN**, Lin L, O'Neil BH. Unusually High Rates of Hypersensitivity to Cetuximab (C-mab) have been Observed in Patients (pts) Treated in the Middle Southern US and Appear to be Associated with a History of Other Atopic Reactions. American Society of Clinical Oncology Annual Meeting. Chicago, IL. June 1-5, 2007.

Hayes DN, Lee C, Roberts P, et al. Subtypes of Lung Adenocarcinoma Derived from Gene Expression Patterns are Recapitulated Using a Tissue Microarray System and Immunohistochemistry. American Association of Cancer Research Annual Meeting. Los Angeles, CA. April 14-18, 2007.

Funkhouser WK, Lee C, Roberts P, **Hayes DN**. Immunohistochemical Detection of Gene Expression Subsets of Non-Small Cell Carcinoma. US & Canadian Academy of Pathology. San Diego, CA. March 27, 2007.

CURRICULUM VITAE
D. NEIL HAYES, MD, MS, MPH

Agulnik M, Cohen EE, Cohen RB, Chen EX, Hotte SJ, Winkvist E, **Hayes DN**, Dancey JN, Tsao M, Siu LL. Prevalence of EGFR and/or ErbB2 Expression in Malignant Salivary Gland Tumors (MSGT) and Correlation with Response to Lapatinib: Results of a Phase II Study. Multidisciplinary Head and Neck Cancer Symposium. Rancho Mirage, CA. January 18-20, 2007.

Agulnik M, Cohen EE, Cohen RB, Chen EX, Hotte SJ, Winkvist E, Laurie S, **Hayes DN**, et al. A Phase II Study of Lapatinib in Recurrent or Metastatic EGFR and/or Erbb2 Expressing Adenoid Cystic (ACC) and Non-ACC Malignant Tumors of the Salivary Glands (MSGT). American Society of Clinical Oncology Annual Meeting. Atlanta, GA. June 2-6, 2006.

Lee S, Yin X, Zanation A, Couch M, Shores C, **Hayes DN**. Cross Platform Validation of Head and Neck Squamous Cell Carcinoma Tumor Subtypes Found by Expression Profiling. Lineberger Annual Cancer Center Retreat and Poster Presentation. Chapel Hill, NC. May, 2006.

Lee S, Yin X, Zanation A, Couch M, Shores C, **Hayes DN**. Cross Platform Validation of Head and Neck Squamous Cell Carcinoma Tumor Subtypes Found by Expression Profiling. American Association of Cancer Research Annual Meeting. Washington, DC. April 1-5, 2006.

Cao H, Gerhold K, Makowski L, **Hayes DN**, Kono K, Watkins SM, Hotamisligil GS. Fatty Acid Binding Proteins (FABPs), aP2 and mal1, Control Systemic Lipid Fluxes, Composition, and Regulate Metabolism, Through Adipose Tissue. Keystone Symposia: Adipogenesis, Obesity and Inflammation. Vancouver, British Columbia. January 21-26, 2006.

Dobbin KK, Beer DG, Meyerson M, Yeatman T, Gerald WL, Jacobson JW, Conley B, Buetow KH, Heiskanen M, Simon RM, Minna JD, Girard L, Misek DE, Taylor JMG, Hanash S, Naoki K, **Hayes DN**, et al. Inter-Laboratory Comparability Study of Cancer Gene Expression Analysis using Oligonucleotide Microarrays. American Association of Cancer Research Annual Meeting. Anaheim, CA. April 16-20, 2005.

Hayes DN. Validating Human Lung Carcinoma Subtypes by mRNA Expression Profiling and Associations with Clinical Outcomes. American Association of Cancer Research Annual Meeting, Orlando, FL. April 29-May 2, 2004.

Hayes DN. Validation of Lung Adenocarcinoma Subtypes by mRNA Expression Profiling. Critical Assessment of Microarray Data Analysis Annual Meeting. Durham, NC. November 12-14, 2003.

Hayes DN. Methods for Validating Human Lung Carcinoma Subtypes by mRNA Expression Profiling and Associations with Clinical Outcomes. American Society of Clinical Oncology Annual Meeting. Chicago, IL. May 31-June 1, 2003.

Hayes DN. Validation of Lung Adenocarcinoma Subtypes by mRNA Expression Profiling. National Institute of Health Director's Challenge Annual Meeting, Bethesda, MD. October 21, 2003.

Hayes DN, Makowski L. Hotamisligil, GS. Application of DNA Microarray Technology in the Setting of Small Sample Size in the FABP apoE^{-/-}aP2^{-/-} Model. Kern Aspen Lipid Conference. Aspen, CO. August 16-19, 2003.

Hayes DN. Screening for Adolescent Gun-Carrying. American Public Health Association Annual Meeting. Atlanta, GA. Oct 24, 2001.

Hayes DN. Adolescents and Weapons Carrying. Massachusetts State Meeting American College of Physicians/Society of Internal Medicine. Boston, MA. 1999.

Teaching Activities

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Lecture

UNC – Didactics for Residents

Molecular Classification of Upper Aerodigestive Tumors. Cytogenetics Curriculum for Pathology Residents. University of North Carolina, Chapel Hill. February 12, 2013.

Genomic and Molecular Classification of Lung Cancer. Pulmonary Division Weekly Seminar Series. Chapel Hill, NC. October 14, 2008.

Updates in Chemotherapy for Head and Neck Cancer. UNC Radiation Oncology Resident Lecture Series. Chapel Hill, NC. January 12, 2006.

Updates in Chemotherapy for Head and Neck Cancer. UNC Otolaryngology Oncology Lecture Series. Chapel Hill, NC. September 21, 2005.

UNC – Seminars for Graduate Students

Clinical Uses of Deep Sequencing in Squamous Cell Head and Neck Cancer. UNC School of Dentistry Oral Biology Lecture Series. Chapel Hill, NC. October 20, 2015.

Pathology 723: Morphologic, Molecular, and Genomic Classification of Aerodigestive Cancers. Invited Lecture: Practical Considerations for Translational Research. Chapel Hill, NC. October 15, 2015.

Thyroid Cancer: The Medical Oncology Perspective. UNC Division of Endocrinology Lecture Series. Chapel Hill, NC. May 21, 2015.

Pathology 723: Morphologic, Molecular, and Genomic Classification of Aerodigestive Cancers. Invited Lecture: Practical Considerations for Translational Research. Chapel Hill, NC. March 31, 2015.

Pathology 723. Morphologic, Molecular, and Genomic Classification of Cancer. Invited Lecture: Genomic Classification of Cancer. Chapel Hill, NC. April 15, 2014.

Pathology 723. Morphologic, Molecular, and Genomic Classification of Cancer. Invited Lecture. Chapel Hill, NC. March 19, 2013.

Pathology 723. Morphologic, Molecular, and Genomic Classification of Cancer. Invited Lecture. Chapel Hill, NC. March 20, 2012.

Translational Research in Lung Cancer. UNC Translational Research in Lung Cancer Series. Chapel Hill, NC. December 12, 2006.

One Color Oligonucleotide Arrays. GeneStat Computational Biology Lecture Series. Lineberger Comprehensive Cancer Center, Chapel Hill, NC. October 10, 2006.

Multiple Group Classification. GeneStat Computational Biology Lecture Series. Lineberger Comprehensive Cancer Center, Chapel Hill, NC. July 21, 2006.

UNC- Didactics for Fellows or Post-Doctoral

Updates in Multidisciplinary Treatment of Head and Neck Cancer. UNC Division of Medical Oncology Lecture Series. Chapel Hill, NC. September 10, 2015.

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Updates in Chemotherapy for Head and Neck Cancer. Fellows Didactic Series. University of North Carolina, Chapel Hill. September 12, 2012.

Updates in Chemotherapy for Head and Neck Cancer. Fellows Didactic Series. University of North Carolina, Chapel Hill. September 9, 2008.

Grand Rounds- UNC

Genomic Classification of Tumors of the Upper Aerodigestive Tract. UNC ENT Grand Rounds. Chapel Hill, NC. May 10, 2017.

Comprehensive Genomic Profiling of Squamous Cell Carcinoma of the Head and Neck. UNC Department of Pathology Grand Rounds. Chapel Hill, NC. May 14, 2015.

Clinical Sequencing for the Oncology Patient. Medical Oncology Grand Rounds. Chapel Hill, NC. May 20, 2014.

Chemotherapy Updates for Head and Neck Cancer. Otolaryngology Grand Rounds. Chapel Hill, NC. April 15, 2014.

Clinical Sequencing for the Oncology Patient. Otolaryngology Grand Rounds. Chapel Hill, NC. January 22, 2014.

HPV-Associated Tumors of the Head and Neck. Medical Grand Rounds. Chapel Hill, NC. October 31, 2013.

ASCO Updates from 2011 for Head and Neck Cancer. Otolaryngology Grand Rounds. Chapel Hill, NC. January 11, 2012.

ASCO Update for Head and Neck Cancer. Otolaryngology Grand Rounds. Chapel Hill, NC. September 28, 2011.

Updates in Chemotherapy for Head and Neck Cancer. Otolaryngology Grand Rounds. Chapel Hill, NC. June 24, 2009.

Genomic and Molecular Classification of Lung Cancer. Molecular Oncology Lecture Series. Department of Pathology and Laboratory Medicine Grand Rounds. Chapel Hill, NC. September 27, 2007.

Updates in Chemotherapy in Squamous Cell Cancer of the Head and Neck. Otolaryngology Grand Rounds. Chapel Hill, NC. May 30, 2007.

Genomic Classification of Lung Cancer for Clinical Use. School of Medicine Grand Rounds. Chapel Hill, NC. April 24, 2007.

Chemotherapy in Squamous Cell Cancer of the Head and Neck: A Primer. Otolaryngology Grand Rounds. Chapel Hill, NC. May 18, 2006.

Grand Rounds- External

Genomic Classification of Tumors of the Upper Aerodigestive Tract. LSU Feist-Weiller Cancer Center. Grand Rounds. Invited. Shreveport, LA. May 2, 2017.

Genomic Classification of Tumors of the Upper Aerodigestive Tract. Taussig Cancer Institute. Cleveland Clinic Grand Rounds. Invited. Cleveland, OH. February 17, 2017.

Genomic Classification of Tumors of the Aerodigestive Tract. University of Kansas Cancer Center. Invited. Kansas City, KS. April 27, 2016.

CURRICULUM VITAE

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Targeted Sequencing Panels: Experience from 2200 Patients Treated on Clinical Trial at a Single Institution. Roswell Park Cancer Institute. Invited. Buffalo, NY. April 6, 2016.

Genomic Classification of Tumors of the Aerodigestive Tract. Roswell Park Cancer Institute. Invited. Buffalo, NY. April 5, 2016.

Morphologic, Molecular and Genomic Classification of Tumors of the Aerodigestive Tract. University of Chicago. Medical Oncology Grand Rounds. Invited. Chicago, IL. March 23, 2016.

Genomic Classification of Tumors of the Aerodigestive Tract. University of Chicago. Medical Oncology Grand Rounds. Invited. Chicago, IL. September 21, 2015.

Comprehensive Genomic Profiling of Squamous Cell Carcinoma of the Head and Neck. University of Pittsburgh Medical Center: Medical Oncology Grand Rounds. Pittsburgh, PA. May 6, 2015.

Updates in the Treatment of Head and Neck Cancer for the Community Oncologist. Oncology Grand Rounds, Pinehurst Hospital. Pinehurst, NC. November 5, 2014.

The Genomics of Head and Neck Cancer in Clinical Management. Oncology Grand Rounds, Vidant Medical Center. Greenville, NC. April 11, 2014.

New Developments in Head and Neck Cancer. Oncology Grand Rounds, New Hanover Regional Medical Center. Wilmington, NC. March 26, 2014.

Genomic Classification of Tumors of the Aerodigestive System. Medical Grand Rounds, Duke University Medical Center. Durham, NC. September 25, 2013.

Updates in the Treatment of Head and Neck Cancer. Medical Grand Rounds, Nash Hospital. Rocky Mount, NC. September 20, 2013.

Genomic Classification of Epithelial Malignancies. Medical Grand Rounds, MD Anderson Cancer Center. Houston, TX. August 6, 2013.

Genomic Classification of Squamous Cell Carcinoma. Medical Grand Rounds, Yale University. New Haven, CT. May 22, 2013.

Updates in the Management of Head and Neck Cancer. Medical Oncology Grand Rounds. Concord, NC. January 4, 2012.

Genomic and Molecular Classification of Lung Cancer. Medical Grand Rounds, Wake Medical Center. Raleigh, NC. December 8, 2008

Genomic and Proteomic Approaches to Cancer Therapeutics. Oncology Grand Rounds, New England Medical Center. Boston, MA. May 2004.

Continuing Education Lecture- UNC

Somatic Alterations in Developmental Genes in Tumors of the Aerodigestive Tract. 41st Annual UNC Lineberger Symposium. UNC Chapel Hill. Invited. Chapel Hill, NC. May 22, 2017.

Squamous Spore and More. UNC Lung Symposium. UNC Chapel Hill. Invited. Chapel Hill, NC. September 2, 2016.

Data Acquisition and Reporting. Rigor and Reproducibility Workshops. UNC Chapel Hill. Invited. Chapel Hill, NC. May 24, 2016.

CURRICULUM VITAE
D. NEIL HAYES, MD, MS, MPH

Targeted Sequencing Panels: Experience from 1700 Patients Treated on Clinical Trial at a Single Institution. The 40th Annual UNC Lineberger Symposium. Invited. Chapel Hill, NC. April 8, 2015.

Genomic Classification of Squamous Cell Carcinoma. Molecular Diagnostics and Cytogenetics Course for UNC Chapel Hill School of Medicine Pathology Residents. UNC Chapel Hill. Invited. Chapel Hill, NC. October 15, 2013.

LCCC1108: Clinical Sequencing for the Care of Cancer Patients. UNC Chapel Hill. Invited. Chapel Hill, NC. April 21, 2013.

Updates in the Treatment of Head and Neck Cancer. UNC Cancer Network Oncology TeleHealth Lectures. UNC Chapel Hill. Invited. Chapel Hill, NC. March 27, 2013.

Next Generation Sequencing for Genomic Classification. Molecular Diagnostics and Cytogenetics Course for UNC Chapel Hill School of Medicine Pathology Residents. UNC Chapel Hill. Invited. Chapel Hill, NC. February 12, 2013.

Taking your MPH to the Clinic and Back. Combined RD/MPH Degree Graduation Address. Invited. UNC Chapel Hill School of Public Health. Chapel Hill, NC. November 30, 2012.

UNC's Program in Clinical Sequencing. External Advisory Board for the Cancer Center. UNC Chapel Hill. Invited. Chapel Hill, NC. October 8, 2012.

Next Generation Sequencing of Somatic Genome Alterations for the Clinical Care of Cancer Patients. Institute for Pharmacogenomics and Individualized Therapy Seminar Series. UNC Chapel Hill. Invited. Chapel Hill, NC. September 11, 2012.

HPV and Head and Neck Cancer. UNC Lineberger Scientific Retreat: HPV and Cancer. UNC Chapel Hill. Invited. Chapel Hill, NC. May 23, 2012.

Development of a Tumor Molecular Analyses Program and Its Use to Support Personalized Treatment Decisions. Agilent Sequencing Symposium. UNC Chapel Hill. Invited. Chapel Hill, NC. May 16, 2012.

UNC- The Best Public Cancer Center in the USA. Medical School 2nd Look Day. UNC Chapel Hill. Invited. Chapel Hill, NC. March 24, 2012.

Updates on Clinical Sequencing. UNC Brain Tumor Research Group. UNC Chapel Hill. Invited. Chapel Hill, NC. February 3, 2012.

UNCseq: A Platform for Clinical Sequencing. Cancer Center Scientific Advisory Board. UNC Chapel Hill. Invited. Chapel Hill, NC. November 14, 2011.

Head and Neck Cancer in the Elderly Patient. Geriatrics Oncology. UNC Chapel Hill. Invited. Chapel Hill, NC. October 13, 2011.

NC Cancer Hospital Patient and Family Advisory Board. NC Cancer Hospital. Invited. Chapel Hill, NC. May 29, 2011.

TLC2 – The Lung Cancer Seminar Series. Lung Cancer Subtypes. UNC Chapel Hill. Invited. Chapel Hill, NC. March 30, 2011.

Head and Neck Cancer for Medical Oncology Fellows. UNC Chapel Hill. Invited. Chapel Hill, NC. September 9, 2010.

CURRICULUM VITAE
D. NEIL HAYES, MD, MS, MPH

UNC Internal Medicine Presentation: The Team Approach to Head and Neck Cancer. The 34th Annual Internal Medicine Conference. William and Ida Friday Center for Continuing Education. Invited. Chapel Hill, NC. April 7-9, 2010.

Bioinformatics at the Lineberger Comprehensive Cancer Center. Lineberger Cancer Center External Advisory Committee. Invited. Chapel Hill, NC. October 5, 2009.

Head and Neck Cancer: Chemotherapy and Clinical Trials at the University of North Carolina. Newton Fisher Society. Invited. Chapel Hill, NC. June 7, 2008.

Conference Organizer. Gene Expression Challenge: Glioblastoma. Organized 5 day working seminar for Gene Expression, Subgroup of The Cancer Genome Atlas. Invited. Chapel Hill, NC. March 24-28, 2008.

Molecular Diagnosis of Lung Cancer. Presented at Personalized Medicine in Oncology: Our Future in Clinical Research. North Carolina Nurses Association and UNC Chapel Hill Clinical Protocol Office. The William and Ida Friday Center. University of North Carolina at Chapel Hill. Invited. Chapel Hill, NC. September 6, 2007.

Molecular Diagnostics in Lung Cancer. UNC Lineberger Comprehensive Cancer Center, Board of Visitor's Meeting. Paul Rizzo Conference Center. Invited. Chapel Hill, NC. August 23, 2007.

Multidisciplinary Management of Head and Neck Cancer. ImClone Systems Southeastern Division, Chapel Hill, NC. Invited. September 2, 2005.

Expression Subtyping in Lung Cancer. UNC Chapel Hill Oncology Lecture Series. University of North Carolina Chapel Hill. Invited. Chapel Hill, NC. October 10, 2003.

Continuing Education Lecture- External

Cancer Genome Atlas Network Head & Neck. International Symposium on HPV Infection in Head and Neck Cancer. Invited Speaker. Leipzig, Germany. November 3, 2016.

Management of High-Risk HPV-Positive Oropharyngeal Cancer, Mini-seminar. AAO-HNSF 2016 Annual Meeting & OTO EXPO. Panel Member. Invited. San Diego, CA. September 18, 2016.

The Human Genome, Cancer Transcriptome, and Relevance to Head and Neck Clinical Trials. NRG Semi-Annual Meeting. Head & Neck TRP Session. Invited. Dallas, TX. July 15, 2016.

What's next for Next Generation Sequencing? American Society of Clinical Oncology Annual Meeting. Oral Abstract Session, Tumor Biology. Invited. Chicago, IL. June 7, 2016.

Mini-symposium Series- Genomic Landscapes. American Association for Cancer Research Co-Chair for Clinical Research. AACR Annual Meeting 2016. Invited. New Orleans, LA. April 18, 2016.

Precision Medicine for Patients with Advanced Cancer: Basket Trials, Bucket Trials, Off Label Therapies and Other Outcomes. Dana-Farber Cancer Institute and Frontier Science Technology and Research Marvin Zelen Memorial Symposium. Invited. Boston, MA. April 1, 2016.

Targeted Sequencing Panels: Experience from 2200 Patients Treated on Clinical Trial at a Single Institution. NC State. Invited. Raleigh, NC. March 24, 2016.

Keynote IV: Genome Atlas and Sequencing Data: How We Use This Going Forward. Multidisciplinary Head and Neck Cancer Symposium: Expanding Treatment Horizons. Invited. Scottsdale, AZ. February 20, 2016.

Molecular Screening: Better Diagnostics for Better Treatments. State-of-the-Art Session. 3rd Annual Summit on Thoracic Malignancies and Head and Neck Cancer. Invited. San Juan, Puerto Rico. December 12, 2015.

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D. NEIL HAYES, MD, MS, MPH

Targeted Sequencing Panels: Experience from 2200 Patients Treated on Clinical Trial at a Single Institution. Translational Sciences Seminar. Levine Cancer Institute. Invited. Charlotte, NC. December 1, 2015.

NCTN: Integrated Translational Science Center at UNC (UNITS). Alliance Fall Meeting. Invited. November 5, 2015.

Content, Compliance, and Technology in Genomic Biomarker Development: Experience with the first 2000 patients with cancer at UNC. Uniformed Services University School of Medicine. Invited. October 13, 2015.

DNA and RNA Integrated Analysis in Cancer and Other Disease. American Society of Human Genetics Annual Meeting: Integrating Genomes and Transcriptomes to Understand Human Disease. Invited. Baltimore, MD. October 10, 2015.

Updates in Multidisciplinary Treatment of Head and Neck Cancer. South Carolina Oncology Society Annual Meeting. Invited. Charleston, SC. August 8, 2015.

Expediting the Learning Curve for Applied Cancer Genomics. Clinical Grade Deep Sequencing for Cancer. American Society of Clinical Oncology. Invited. Chicago, IL. May 29, 2015.

Clinical Uses of Deep Sequencing in Squamous Cell Head and Neck Cancer. American Head and Neck Society's 2015 Translational Research Meeting: Keynote Lecturer. Invited. Boston, MA. April 22, 2015.

Clinical Targets from Sequencing Projects. American Head and Neck Society's 2015 Translational Research Meeting: Genetics and Deep Sequencing Target and Pathways Session. Invited. Boston, MA. April 22, 2015.

The American Association for Cancer Research Annual Meeting 2015. The Impact of Gene Panel Sequencing on Clinical Care in Patients with Cancer. Clinical Trials Mini-Symposium. Invited. Philadelphia, Pennsylvania. April 19, 2015.

Lessons Learned From the Cancer Genome Atlas. 5th Annual Meeting of the Society for Translational Oncology, Ohio State University. Invited. Columbus, OH. April 10, 2015.

Internet-Based Presentation sponsored by Washington University K12 Scholars Program. Genomics of Head and Neck Cancer. Invited. St. Louis, MO. March 18, 2015.

Morphologic, Molecular, and Genomic classification of Aerodigestive Cancers. Center for Toxicology and Markey Cancer Center, University of Kentucky Cancer Lecture Series. Invited. Lexington, KY. November 17, 2014.

Developing RNA-Based Molecular Diagnostics in the Post-Genomic Era. Institute of Medicine, National Cancer Policy Forums: Policy Issues in the Development and Adoption of Molecularly Targeted Therapies for Cancer. Invited. Washington, DC. November 10, 2014.

Discovering versus Diagnosing Driver Mutations: Birds of a Feather. Southwest Oncology Group, Translation Medicine. Invited. Chicago, IL. October 25, 2014.

Content, Compliance, and Technology in Genomic Biomarker Development. Duke/University of North Carolina Melanoma Fall Retreat. R David Thomas Center. Invited. Durham, NC. September 12, 2014.

The Cancer Genome Atlas Experience in Head and Neck Cancer. Emerging Issues in Head and Neck Cancer Workshop. Invited. San Pietro, Bevagna, Manduria, Italy. June 2, 2014.

Chemotherapy Updates for Head and Neck Cancer. William J. Smith Memorial Oncology Conference. Invited. Asheville, NC. April 25, 2014.

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Genomics for Personalized Care of Cancer Patients. Addressing Evidence and Value in Personalized Medicine. Tampa, FL. April 5, 2014.

Clinical Sequencing Using LCCC1108 with CLIA Validation. Alliance Annual Meeting. Invited. Chicago, IL. November 8, 2013

Updates in Head and Neck Cancer for the Tumor Registrar. Annual Association of North Carolina Cancer Registrars Meeting. Invited. Hendersonville, NC. September 27, 2013.

LCCC1108: Clinical Sequencing for Patient Care. Duke University Medical Center. Institute for Personalized Medicine. Invited. Durham, NC. September 26, 2013.

The Cancer Genome Atlas: Integrated Analysis of Genome Alterations in Squamous Cell Carcinoma of the Head and Neck. American Society of Clinical Oncology Annual Meeting. Clinical Sciences Symposium. David N. Hayes, Jennifer R. Grandis, Adel K. El-Naggar. Invited. Chicago, IL. May 30, 2013.

Biomarkers in Head and Neck Cancer- Poster Discussant. American Society of Clinical Oncology Annual Meeting. Invited. Chicago, IL. June 2, 2012.

Morphologic, Molecular and Genomic Classification of Lung Cancer. Deutsche Forschungsgemeinschaft: Hinterzartener Kreis für Krebsforschung Annual Meeting. Invited. Lake Como, Italy. April 27, 2012.

Biomarkers for pathways and Targets. Session Co-chair. American Association of Cancer Research. Invited. Chicago, IL. April 3, 2012.

Molecular and Genomic Classification of Tumors of the Lung. Session Chair. 19th Molecular Tri-Con. Invited. San Francisco, CA. February 24, 2012.

Clinical Presentation and GDAC Update. TCGA Scientific Symposium. Invited. Washington, D.C. November 17-18, 2011.

Molecular, Morphologic, and Genomic Classification of Cancer. US-Japan Workshop on Cancer Genomics. Invited. Kyoto, Japan. October 24, 2011.

Integrated Genomic Analysis Identifies Clinically Relevant Subtypes of Glioblastoma Characterized by Abnormalities in PDGFRA, IDH1, EGFR, and NF1. 10th International Neuro-Oncology Update. Invited. Nashville, TN. September 15, 2011.

Expression Profiling in the Cancer Genome Atlas. 20th Annual Short Course on Experimental Models of Human Cancer. Jackson Lab. Invited. Bar Harbor, ME. August 24, 2011.

Fall Membership Conference for the South Carolina Oncology Society. Genomic Classification of Cancer. Invited. Charleston, SC. August 5, 2011.

The Cancer Genome Atlas: An Extraordinary Enterprise. Genomic Classification of Cancer. Invited. Houston, TX. April 14, 2011.

Genomic Classification of Tumors of the Lung. Medical Oncology Grand Rounds. Invited. University of Toronto. Princess Margaret Hospital. Toronto, Canada. March 30, 2011.

Genomic Classification of Cancer: Examples from Lung Cancer and Beyond. Vanderbilt University. SPORE Lecture Series. Nashville, TN. March 11, 2011.

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Updates in Chemotherapy for Head and Neck Cancer. Continuing Education Program. NC Chapter of the Society of Otorhinolaryngology and Head-Neck Nurses. Invited. Chapel Hill, NC. March 5, 2011.

Detection of Lung Cancer Molecular Subtypes by Gene Expression Arrays, Protein Immunohistochemistry and PCR from Paraffin Based Assays. 18th Molecular Tri- Con. Invited. San Francisco, CA. February 25, 2011.

The Cancer Genome Atlas: An Integrated Genomic Analysis Identifies Clinically Relevant Subtypes of Glioblastoma. 18th Molecular Med Tri-Con. Invited. San Francisco, CA. February 24, 2011.

The Genomic Approach to Cancer Subtyping. Case Comprehensive Cancer Center. Case Western Reserve University. Department of Genetics Seminar. Invited. Cleveland, OH. January 26, 2011.

Updates in Chemotherapy for Head and Neck Cancer. 22nd Annual Fall FOLIAge Cancer Conference. Invited. Asheville, NC. October 22, 2010.

Expression Profiling in- The Cancer Genome Atlas. 19th Annual Short Course on Experimental Models of Human Cancer. Jackson Lab. Invited. Bar Harbor, ME. August 24, 2010.

NC State Oncology Meeting. Genomic Profiling: Role in the Treatment of (Lung) Cancer. Invited. Cary, NC. August 10, 2010.

Update on Head and Neck Cancer Treatments. Big Sky Oncology Update 2010. Invited. Big Sky, MT. August 6-7, 2010

Integrated Genomic Analysis Identifies Clinically Relevant Subtypes of Glioblastoma Characterized by Abnormalities in PDGFRA, IDH1, EGFR, and NF1. American Association of Cancer Research. Translational Cancer Medicine Conference. Invited. San Francisco, CA. July 13, 2010.

Biology Section Discussant: Oral Abstracts in Tumor Biology. American Society of Clinical Oncology. Invited. Chicago, IL. June 7, 2010.

NIH Directors Community Liaison Group: Promoting Progress in Rare Tumors. American Society of Clinical Oncology. Invited. Chicago, IL. June 5, 2010.

Integrated Genomic Analysis Identifies Clinically Relevant Subtypes of Glioblastoma Characterized by Abnormalities in PDGFRA, IDH1, EGFR, and NF1. University of Texas. MD Anderson Cancer Center. Brain Tumor Program Seminar Series. Invited. Houston, TX. April 1, 2010.

Genomics: Scope of the Field and Status of TCGA- An Interactive Tutorial. The Future of TCGA- Sequencing, Data Integration, Analysis and Team Science. 53rd Meeting of the NCI Director's Consumer Liaison Group. National Cancer Institute. National Institutes of Health. Invited. Bethesda, MD. March 24-26, 2010.

Genomic Approaches to Cancer Classification. National Institute of Environmental Health Sciences. Research Triangle Park, NC. Invited. February 10, 2010.

Multidisciplinary Management of Head and Neck Cancer. Weekly Oncology Lecture Seminar. Wake Forest School of Medicine. Baptist Hospital, Invited. Winston-Salem, NC. Invited. October 26, 2009.

NCI 7918: The Use of AZD6244 in Iodine Refractory Papillary Thyroid Carcinoma. 2009 Fall CTEP Early Drug Development and IDSC Meeting. Invited. Arlington, VA. October 5, 2009.

Poster Discussant – Head and Neck Cancer Therapeutics Section. American Society of Clinical Oncology Annual Meeting. Invited. Orlando, FL. June 1, 2009.

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Clinical Applications of Gene Expression Profiling in Lung Cancer. American Society of Clinical Oncology Annual Meeting. Invited. Orlando, FL. May 31, 2009.

Panel Chairman. The Cancer Genome Atlas Working Group on the Analysis of microRNA in Ovarian Cancer. Invited. Berkeley, CA. May 21-22, 2009.

Panel Chairman. The Cancer Genome Atlas Working Group on the Analysis of microRNA in Malignant Gliomas. Invited. Bethesda, MD. December 3-4, 2008.

Non-Radioiodine Options and Clinical Trials in Thyroid Cancer. S.E. Chapter of the Society of Nuclear Medicine, 49th Annual Meeting. Invited. Tampa, FL. September 26, 2008.

Updates in Chemotherapy for Head and Neck Cancer. Friday Noon Conference. Brody School of Medicine. East Carolina University. Invited. Greenville, NC. September 12, 2008.

Head and Neck Cancer: Updates in Therapy. South Carolina Medical Society Annual Meeting. Invited. Charleston, SC. August 9, 2008.

The Potential for Molecular Diagnostics Based on Lung Cancer Gene Expression Profiling from Clinically Derived Paraffin Samples. Genomic Health. Invited. Redwood City, CA. July 28, 2008.

The Classification of Glioblastoma by Gene Expression Profiling. Steering Committee Meeting at Memorial Sloan Kettering Comprehensive Cancer Center. The Cancer Genome Atlas. Invited. New York, NY. July 23, 2008.

Classification of Lung Cancer: The Clinical Experience. Emerging Statistical Challenges in Genomics. Invited. Banff, AB, Canada. June 4, 2008.

Expression Profiling of Human Glioblastomas. Agilent Corporation sponsored seminar. American Association of Cancer Research, Invited. San Diego, CA. April 15, 2008.

Parallel MicroRNA and Gene Expression Profiling of Human Glioblastomas. American Association of Cancer Research. Qi Y, Hoadley K, Perou CM, Hayes DN. Invited. San Diego, CA. April 14, 2008.

Integration of Clinical Data and Gene Expression from- The Cancer Genome Atlas: Data Portal Development Project. The Cancer Genome Atlas Data Portal Workshop. Invited. Bethesda, MD. January 10, 2008.

Gene Expression Subtyping Reveals Reproducible Tumor Subtypes in Glioblastoma. The Cancer Genome Atlas Steering Committee Meeting. Gene Expression Analysis Subgroup Leader. Invited. St. Louis, MO. December 3, 2007.

Molecular Biology of Head and Neck Cancer. Third Annual Head and Neck Cancer Symposium. Invited. Philadelphia, PA. December 1, 2007.

Gene Expression Subtyping Reveals Reproducible Tumor Subtypes in Glioblastoma. The Cancer Genome Atlas Data Analysis Jamboree. Analysis Subgroup Leader. Broad Institute of Massachusetts Institute of Technology and Harvard University. Invited. Cambridge, MA. November 28, 2007.

Genomic Classification of Lung Cancer for Clinical Use. Mathematical Systems Biology of Cancer Workshop. Mathematical Sciences Research Institute, Invited. Berkeley, CA. October 25, 2007.

Chemotherapy in Squamous Cell Cancer of the Head and Neck: A Primer. Otolaryngology Tumor Board, Medical University of South Carolina. Invited. Charleston, SC. October 12, 2007.

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Molecular Typing of Human Lung Cancer by Gene Expression Arrays. Translational Seminar Series. University of Utah. Invited. Salt Lake City, UT. October 10, 2007.

Genomic and Molecular Classification of Lung Cancer. Molecular Oncology Lecture Series. Invited. Washington University, St. Louis, MO. May 4, 2007.

Methods for Validating Tumor Subtypes by mRNA Expression Profiling. Bioinformatics Work in Progress Series. Broad Institute of Harvard and MIT. Invited. Cambridge, MA. June 29, 2004.

Validating Human Lung Carcinoma Subtypes by mRNA Expression Profiling and Associations with Clinical Outcomes. American Association of Cancer Research, Invited. Orlando, FL. March 27-31, 2004.

A New Concatemer-Based Approach to Pathogen Discovery and Digital Karyotyping. Bioinformatics Friday Series. Dana Farber Cancer Center. Invited. Boston, MA October 22, 2003.

Validation of Lung Adenocarcinoma Subtypes by mRNA Expression Profiling. National Institute of Health Director's Challenge Annual Meeting, Invited. Bethesda, MD. October 21, 2003.

Expression Subtyping in Lung Cancer. Duke University Thoracic Oncology Lecture Series. Duke University. Invited. Durham, NC. October 9, 2003.

Lung Tumor Expression Subtypes Are Reproducible by mRNA Expression Profiling. Bioinformatics Work in Progress Series. Whitehead Institute of Harvard and MIT. Invited. Cambridge, MA. October 7, 2003.

Clinical Trials and Clinical Equivalence: Are These Two Therapies Equivalent? Thoracic Malignancies Lecture Series. Dana Farber Cancer Center. Invited. August 20, 2002.

Screening for Adolescent Gun-Carrying. American Public Health Association Annual Meeting. Invited. Atlanta, GA. Oct 24, 2001.

Adolescents and Weapons Carrying. Massachusetts State Meeting American College of Physicians/Society Internal Medicine. Invited. Boston, MA. 1999.

Lab or Research Teaching/Mentorships

Post-Doctoral Fellows/Junior Faculty

C. Callie Coombs, 2016- Present. MD (2010). University of Cincinnati. Utilize Next-Generation Sequencing Data to Answer Important Clinical Questions Regarding the Impact of Clonal Hematopoiesis in Solid Tumor Patients.

Xiaobei Zhao, 2012-Present. PhD (2012). University of Copenhagen. Computational Biology with Focus in Method Development and Applications of Next-Generation Sequencing Technologies. Genetics and Genomics of Melanoma.

Woochang Lee, 2015-2016. MD/PhD (1997). Seoul National University, College of Medicine. Methods in RNA Sequence Analysis.

Yoon Ho Ko, 2014-2015. MD (1997), PhD (2012). Catholic University of Korea. MicroRNA Profiling in Patients with Head and Neck Cancer. Currently Associate Professor in Division of Oncology, Department of Internal Medicine, College of Medicine, Uijeonbu St. Mary's Hospital. The Catholic University of Korea, Seoul, Korea.

Paul Armistead, 2012-2015. MD (2000), PhD (2002). University of North Carolina, Chapel Hill. K08 Mentor. Identification and Characterization of Leukemia Stem Cell-Associated Minor Histocompatibility Antigens. Currently

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an Assistant Professor of Hematology/Oncology at the Lineberger Comprehensive Cancer Center at the University of North Carolina at Chapel Hill.

Sang-Won Um, 2012-2014. MD (1998), MPH (2006), PhD (2010) Seoul National University. Mutation Profiling and Protein Expression in Patients with Non-Small Cell Lung Cancer. Currently Associate Professor of Pulmonary and Critical Care Medicine, Samsung Medical Center. Sungkyunkwan University School of Medicine, South Korea.

Wisut Lamlertthon, 2011-2012. MD (1994) Mahidol University-Thailand. EGFR Mutation Signature in Lung Adenocarcinoma. Currently a Medical Oncology Specialist at Chulabhorn Hospital in Thailand.

Ying Du, 2010-2012. PhD (2006) Michigan State University. Investigation into how miRNAs regulate the Human Lung Bronchial Epithelial Cell Differentiation. Integrated Genomic Analysis Investigating Multiple Regulatory Mechanisms Regulating Important Cancer Genes in GBM. Currently a Contractor in the Division of Intramural Research at the National Institute of Environment Health Sciences.

Mihir Patel, 2008-2012. MD (2006) University of North Carolina at Chapel Hill. Mentored F32 Funded Project as part of ENT Residency Training: ERCC1 as a Biomarker from Prognosis in Head and Neck Cancer. Currently Assistant Professor, Department of Otolaryngology at Emory University School of Medicine.

Matthew Wilkerson, 2008-2012. PhD (2007) Iowa State. Mentor for F32 Training Grant: Molecular Subtypes of Non-Small Cell Lung Cancer. Currently a Research Associate at the Lineberger Comprehensive Cancer Center at the University of North Carolina at Chapel Hill.

Mei-Kim Ang, 2009-2011. MD (2008) Singapore. High XRCC1-Protein Expression Associated with Poorer Survival in Patients with Head and Neck Squamous Cell Carcinoma. Currently a Medical Oncologist at the National Cancer Centre in Singapore.

Amy Lucas, 2009-2011. MD (2005) Mercer University School of Medicine. Mentor for Research Including Funding from the NCI's Translational Research Informatics Center for Clinical Trial NCI 7918 as part of Medical Oncology Fellowship Program: AZD6244 for Iodine Refractory Papillary Thyroid Carcinoma. Currently a Clinical Assistant Professor at the Mercer University School of Medicine, and Physician at the Central Georgia Cancer Center.

Jennifer Nelson, 2008-2011. MD (2005) University of North Carolina at Chapel Hill. Co-Mentor. Screening for Brain Metastasis in Surgically Managed Lung Cancer. Currently a Cardiothoracic Surgical Resident at the University of Michigan.

Vonn Walter, 2009-2010. PhD (2010) University of North Carolina at Chapel Hill. PhD (1994) University of Illinois at Champaign-Urbana. Genomics of Head and Neck Cancers. Currently Assistant Professor in the Department of Informatics at the Institute for Personalized Medicine, Pennsylvania State University.

Smith "Jim" Apisarnthanarax, 2008-2010. MD (2002) Brown University Warren Alpert Medical School. Mentored, Radiation Oncology Residency. Non-melanoma Skin Cancer. Currently an Associate Professor of Radiation Oncology at the University of Washington.

Steve Harris, 2008-2010. MD (2005) Indiana University. Mentored, Radiation Oncology Residency. Head and Neck Cancer in Young Patients. Currently a Radiation Oncologist at Radiation Oncology Associates, P.A., in Manchester, New Hampshire.

Juneko Grilley-Olson, 2007-2010. MD (2003) University of Wisconsin-Madison. Mentored Research, Including Translational Funding from Lineberger Comprehensive Cancer Center as part of Medical Oncology Fellowship Program: Reliability and Reproducibility of WHO Classification of Tumors of the Lung, 4th Edition. Currently an Assistant Professor of Medicine at the University of North Carolina at Chapel Hill.

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Shaowu Meng, 2007-2010. PhD (1995) Kunming Institute of Botany, Chinese Academy of Sciences. Genomic Characterization of Lung, Ovarian and Glial Tumors. Currently a Research Associate at Lineberger Comprehensive Cancer Center, Chapel Hill, North Carolina.

Emily Jenkins, 2008-2009. MD. Mentored, Internal Medical Residency Research: Genomic Characterization of Lung, Ovarian and Glial Tumors. Currently a Hematology/Oncology Fellow at the University of North Carolina at Chapel Hill.

Usman Shah, 2007-2009. MD (2002) Medical College of Wisconsin. Mentored, Medical Oncology Fellowship Research: LKB1 Mutation and Association with Clinical Outcomes in Non-Small Cell Lung Cancer. Currently a Hematology Oncology Associate with the Lehigh Valley Physician Group.

Yuan Qi, 2006-2008. PhD (2006) University of Texas-Southwestern. Genomic Characterization of Lung, Ovarian and Glial Tumors. Currently a Staff Scientist at MD Anderson. Currently a Staff Scientist at the University of Texas MD Anderson Cancer Center.

Carrie Lee, 2005-2007. MD/MPH (2002) Northeastern Ohio Universities College of Medicine. Mentored, Medical Oncology Fellowship Research: K-ras Mediated Relapse and Metastasis in Non-Small Cell Lung Cancer: Use of Tissue Microarray to Determine Prognostic Markers. Currently a Clinical Assistant Professor at the University of North Carolina at Chapel Hill.

Alden Parsons, 2004-2007. MD (1999) University of North Carolina at Chapel Hill. Mentored, Thoracic Fellowship Research: Predictive Model for Mediastinal Lymph Node Status at the Time of Mediastinoscopy. Currently a Clinical Assistant Professor in the Department of Surgery at the University of North Carolina at Chapel Hill, and Leader of Rex Thoracic Specialists.

Patrick Roberts, 2004-2007. PharmD (2002) University of Kentucky. PhD (2007) University of North Carolina at Chapel Hill. Co-Mentored, PhD research: K-ras Mediated Relapse and Metastasis in Non-Small Cell Lung Cancer: Use of Tissue Microarray to Determine Prognostic Markers. Currently Director of Translational Medicine at G1 Therapeutics, Chapel Hill, North Carolina.

Steve Lee, 2004-2006. MD, PhD (2002) Loma Linda University. Mentored, ENT Residency Training Research: Cross Platform Validation of Head and Neck Squamous Cell Carcinoma Tumor Subtypes Found by Expression Profiling. Currently an Assistant Professor of Otolaryngology and Head/Neck Surgery at Loma Linda University.

Students

Xiaobei Zhao, 2015-Present. BS/BA (2011). University of North Carolina at Chapel Hill. PhD Candidate in Biostatistics. Head and Neck Tumors

Paul Little, 2015-Present. BS/BA (2011). University of North Carolina at Chapel Hill. PhD Candidate in Biostatistics. UNCseq.

Hyo Young Choi, 2015-Present. MA (2013). Seoul National University. PhD Candidate in Statistics and Operations Research. Methods in RNA Sequence Analysis.

Heejoon Jo, 2013-Present. BA (2010). State University of New York at Buffalo. PhD Candidate in Biostatistics. Application of Next-Generation Sequencing Technologies.

Ping-Jie Xiao, 2013-2014. PhD (2013). University of North Carolina at Chapel Hill. Gene therapy and imaging analysis. Next-generation sequencing analysis.

Thomas Stewart, 2012-2015. MS (2008) Brigham Young University. PhD (2015) University of North Carolina at Chapel Hill. Analysis of Immunohistochemistry Data in Various Applications. Currently Assistant Professor in the Department of Biostatistics at Vanderbilt University.

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Patrick Kimes, 2012-2015. BA (2009) Pomona College. PhD (2015) University of North Carolina at Chapel Hill. Statistical Analysis of RNA-Seq as Functional Data. Currently Principal Scientist I – Bioinformatics in Pleasanton, California.

Ni Zhao, 2009-2014. MD (2007) Fudan University, P.R. China. MPH (2009) University of North Carolina at Chapel Hill. PhD Candidate in Biostatistics. Mentor for Various Research Projects in Biomarkers and Genomics.

Chris Cabanski, 2009-2012. PhD (2012) University of North Carolina at Chapel Hill. Co-Mentor for PhD Research, Including: SWISS MADE: Standardized Within Class Sum of Squares to evaluate Methodologies and Dataset Elements. Currently a Biostatistician at Genentech, San Francisco, California.

Lauren Gainor, 2005-2007. MD (2007) University of North Carolina at Chapel Hill. Mentored Medical Student Research: Predictive Model for Mediastinal Lymph Node Status at the Time of Mediastinoscopy. Currently Chief Resident and Instructor of Pediatrics at the University of Colorado Aurora Children's Hospital.

Rotation Students

Guosheng Zhang, 2011. PhD Student. Detect Copy Number Variation in Cancer Genome through Targeted High-Throughput Sequencing.

Marni Siegel, 2011. MD/PhD Student. Optimizing a Capture Protocol for Formalin- Fixed, Paraffin-Embedded (FFPE) DNA.

Attending on Clinical Service

Med Onc E2/L/Consult Services, Approximately 4 weeks per year, 2004-Present.

Graduate Supervision, Committees

Junior Faculty Mentoring Committees

C. Callie Coombs, MD. 2016-Present. University of Cincinnati.

Juneko Grilley-Olson, MD. 2012-Present. University of Wisconsin-Madison Medical School.

Jay Coghill, MD. 2010-2013. Virginia Commonwealth University.

Raj Kasthuri, MBBS, MD. 2010-2013. Kasturba Medical College, India

Other Supervision

Qualifying Exam and Thesis Committees

Heejoon Jo. PhD Student. Department of Biostatistics and Public Health. UNC Chapel Hill. 2017- Present.

Hyo Young Choi. PhD Student. Department of Statistics and Operations Research. UNC Chapel Hill. 2017- Present.

Erica Cloer. PhD Student. Department of Cell Biology and Physiology. "Molecular Mechanisms of Patient-Derived KEAP1 Mutations." 2017- Present.

Adele Musicant, PhD Student. Department of Genetics and Molecular Biology. 2016- Present.

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Guosheng Zhang, PhD Student. “Bioinformatics Tools for Exploring Regulatory Mechanisms.” 2014-2016.

Hanyan Wang, M.S. Candidate. Department of Statistics and Operations Research. UNC Chapel Hill. “An Exploratory Analysis of pMEK Distribution Characteristics and Association with Clinical Data on Lung Cancer.” 2015-2016.

Zhenhua Yuan, M.S. Candidate. Department of Statistics and Operations Research. UNC Chapel Hill. “The Effects of Four Biomarkers Expression Level and Other Explanatory Characteristics of NSCLC Cancer Patients on their Overall Survival Time.” 2015-2016.

Patrick Kimes, PhD Candidate. UNC Chapel Hill, College of Arts & Sciences. Department of Statistics and Operations Research. 2014.

Thomas Stewart, PhD Candidate. UNC Chapel Hill, School Of Public Health, Department of Biostatistics. 2014.

Erica Cloer, PhD Candidate. UNC Chapel Hill. Program in Translational Medicine. 2014.

Will Jeck, MD/PhD Candidate. UNC Chapel Hill, School of Medicine, Department of Genetics. 2013.

Bridgid Hast, PhD Candidate. UNC Chapel Hill, School of Medicine, Department of Cell Biology and Physiology. 2013.

Wei Zhao, PhD Candidate. UNC Chapel Hill, School Of Public Health, Department of Bioinformatics and Computational Biology. 2011.

Wonyul Lee, PhD Candidate. UNC Chapel Hill, College of Arts & Sciences, Department of Statistics and Operations Research. 2011.

Hanwen Huang, PhD Candidate. UNC Chapel Hill, College of Arts & Sciences, Department of Statistics and Operations Research. 2011.

Yihui Zhou, PhD Candidate. UNC Chapel Hill, School Of Public Health, Department of Biostatistics. 2010.

Chris Cabanski, PhD Candidate. UNC Chapel Hill, College of Arts & Sciences, Department of Statistics and Operations Research. 2010.

Vonn Walter, PhD Candidate. UNC Chapel Hill, School Of Public Health, Department of Biostatistics. 2010.

Grants

Active

NCI National Clinical Trials Network - Network Group Integrated Translational Science Centers (UG1). RFA-CA-17-061. National Institutes of Health (NIH). 03/01/2019-02/28/2025. \$2,758,836. Role Co-PI 10%

Metabolic and Molecular Biomarkers of Metformin Response in Obesity-driven Endometrial Cancer
The V Foundation for Cancer Research. 11/01/2017-10/31/2020. \$120,711. Role Co-PI. 7.58%

Immune Regulation of Lung Squamous Metastasis. 1R01CA215075-01A1
National Institutes of Health (NIH). 9/1/2017- 8/31/2022. \$3,100,840.00. Role Co-PI. 10%.

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Development of a Four-Class, Molecular Subtyping Diagnostic for HPV-negative Head and Neck Cancer.

1R01CA211939-01A1

National Institutes of Health (NIH-NCI). 8/1/2017- 7/31/2022. \$1,564,798.00. Role Co-PI. 10%.

The Role of Germline and Somatic DNA Mutations in Oral and Oropharyngeal Cancers. 1R01DE025712-01A1

International Agency for Res on Cancer (IARC). 1/10/2017-12/31/2021. \$650,254. Role Co-PI. 10%.

Targeting Lung Squamous Metastasis with CCR2 Inhibitors.

Free to Breathe. 2/14/17 – 12/31/19. \$400,000. Role: Co-Investigator. 5.00%.

RNA Sequencing Analysis of Cancer. 1-U24-CA210988-01.

National Institutes of Health (NIH). 9/15/16 – 8/31/21. \$888,520. Role: Co-PI. 10.00%.

Investigation of the Impact of Clonal Hematopoiesis in patients with solid Tumors without known Hematologic Disease.

Conquer Cancer Foundation. 9/1/2016 – 8/31/2017. \$50,000. Role: Mentor. 0.00%

Kinase Inhibition in Kidney Cancer. 1-R01-CA202053-01A1.

National Institutes of Health (NIH). 8/1/16 – 7/31/21. \$432,423. Role: Co-Investigator. 2.50%.

Duke-UNC-Washington U Partnership for Early Phase Clinical Trials in Cancer-Supplement.

Duke University. Subcontracted National Institutes of Health (NIH). 4/1/16-3/31/19. \$242,256. Role: Co-Investigator. 5.00%.

Cancer Center Core Support Grant-Bioinformatics Core. 5-P30-CA016086-40.

National Institutes of Health (NIH). 12/1/15 – 11/30/20. \$3,765,742. Role: Bioinformatics Core Faculty Director. 5.00%

Cancer Center Core Support Grant-Program Leaders. 2-P30-CA016086-40.

National Cancer Institute. 12/1/15 – 11/30/20. \$5,256,857. Role: Program Leader. 5.00%

Flexible Statistical Machine Learning Techniques for Cancer-Related Data.

National Institutes of Health (NIH). 7/1/2015-6/30/2020. \$280,900. Role: Co-Investigator. 5.00%.

Medical Scientist Training Program. 3-T32-GM008719-17S2.

NIH National Institute of General Medical Sciences (NIGMS). 7/1/15-6/30/19. Role: Co-Investigator. 5.00%.

Network Group Integrated Translational Science Centers Application. 5-U10-CA181009-03.

National Institutes of Health (NIH). 3/1/14-2/28/19. \$2,686,935. Role: PI. 12.50%

Team Science Approach for Defining the Activation State and Dynamic Reprogramming of the Kinome in Aerodigestive Cancer.

V Foundation for Cancer Research. 12/1/14-11/30/17. \$ 600,000. Role: Co-PI. 5.00%.

Completed

CDK4/6 Inhibition in Urothelial Cancer: Defining Molecular Predictors of Response and Resistance.

Bladder Cancer Advocacy Network. 7/15/15-7/14/17. \$50,000. Role: Co-Investigator. 2.00%

Mass Spectrometry-Coupled Hypermorphic Functional Genomics. R21-CA178760-01A1.

NIH National Cancer Institute (NCI). 9/1/14-3/31/17. \$150,000. Role: Co-Investigator. 5.00%.

Flexible Statistical Machine Learning Techniques for Cancer-Related Data. 5-R01-CA149569-05.

National Cancer Institute. 2/1/10-12/31/16. \$219,906. Role: Co-Investigator. 5.00%.

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CKD 4/6 Inhibition in Urothelial Carcinoma: Defining Molecular Predictors of Response and Resistance.
National Inst. of Health. 12/1/14-11/30/16. \$150,000. Role: Co-Investigator. 2.00%.

UNC Cancer RNA Genomic Characterization Center.
National Institute of Health (NIH) Subcontracted Leidos Biomedical Research. 9/1/15-8/31/16. \$2,296,984. Role: Co-Investigator. 5.00%.

Pathobiology and Clinical Profile of HIV-Associated Cancers in India and the West. 5-R21-CA177315-02.
National Cancer Institute. 4/1/13-7/31/16. \$138,840. Role: Co-PI. 5.00%.

Best Practices to Ensure Reproducibility and Rigor in Research.
NIH National Institute of General Medical Sciences (NIGMS). 7/1/15-6/30/16. \$80,000. Role: Co-Investigator. 5.00%.

Targeted DNA Sequencing of HPV-Positive Oropharyngeal Cancer Treatment Failures.
American Academy of Otolaryngology Head and Neck Foundation. 7/1/15-6/30/16. \$28,446. Role: Co-Investigator. 5.00%.

Integrated Analysis of Chromatin Structure and Gene Expression Patterns in Humans. 5-U24-CA143848-01-05.
National Cancer Institute. 09/29/09-6/30/16. \$4,161,072. Role: Co-Investigator. 5.00%.

Gene Expression Patterns in Human Tumors Identified Using Transcript Sequencing. 5-U24-CA143848-05.
National Cancer Institute. 9/29/09 – 6/30/16. \$12,743,760. Role: Co-PI. 10.00%

Validation of the Efficacy of Lung Observations (VELO), V3.
GeneCentric. 1/1/12 - 12/31/15. \$208,350. Role: PI. 5.00%.

Pre-Clinical and Clinical Investigation of the Impact of Obesity on Ovarian Cancer Pathogenesis.
DOD DA Army Medical Research Acquisition Activity. 9/25/12-9/24/15. \$99,179. Role: Co-Investigator. 5.00%.

Obesity Exposure across the Lifespan on Ovarian Cancer Pathogenesis.
Department of Defense (DOD) 6/1/13-5/31/15. \$124,360. Role: Co-Investigator. 5.00%.

Identification of a Gene Expression Signature Profile for Panitumumab Sensitivity in Untreated Locally Advanced Squamous Cell Cancer of the Head and Neck (SCCHN).
Duke University Medical Center. 3/22/12-12/31/12. \$61,190. TOP 0901. Role: Co-Investigator. 5.00%.

A Needle in a Haystack: Finding Key “Driver Mutations” from Thousands of Passenger Mutations in Individual Cancer Patients.
Greensboro Golfers against Cancer. 1/1/2012 – 12/31/2012. \$60,000. Role: Co-Investigator. 5.00%.

Lung Squamous Cell Carcinoma Subtypes: Genomic Aberrations and Clinical Detection. 5-F32-CA142039-03.
National Cancer Institute. 9/30/09 - 9/29/12. \$150,000. Role: PI. 5.00%.

Micro RNA Regulation of Human Airway Epithelial Phenotype. 1-RC1-HL100108-01.
National Heart Lung and Blood Institute (ARRA). 9/30/09 - 8/21/12. \$499,999. Role: Co-PI. 5.00%.

Cancer Genome Characterization using Gene Expression and DNA Copy Number Analysis. 5-U24-CA126544-03. 9/28/06 - 8/31/11. \$3,699,542. Role: Co-Investigator. 5.00%.

The Role of HIF2 in LKB1-Defective Lung Tumors.

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Joan's Legacy Lung Cancer Foundation. 12/1/08-11/30/10. Role: Co-Investigator. 5.00%.

MicroRNA Alteration in Human Head and Neck Squamous Cell Carcinoma. Research Award.
UNC Lineberger. 7/1/09 - 6/31/10. \$50,000. Role: Co-PI. 5.00%.

Genomic Classification of Head and Neck Cancer in Paraffin Samples. LCCC07-4072.
UNC-University Cancer Research Fund. 4/1/09 - 3/31/10. \$150,000. Role: PI. 5.00%.

Reliable Classification of Lung Cancer: Comparison of Morphologic and Molecular Classification.
Lineberger Comprehensive Cancer Center. 5/18/08 - 5/17/10. \$50,000. Role: Co-Investigator. 5.00%.

Molecular Subtypes of Non-Small Cell Lung Cancer. Completed Foundation Grant.
Joan's Legacy Lung Cancer Foundation. 12/12/07 - 12/11/09. \$100,000. Role: PI. 5.00%.

Cancer Genome Characterization using Gene Expression and DNA Copy Number Analysis. 5-U24CA126544
National Institutes of Health. 9/28/06 - 8/31/09. \$1,154,585. Role: Co-Investigator. 5.00%.

Validation of Molecular Lung Adenocarcinoma Subtypes. K12-RR023248.
Multidisciplinary Clinical Research Career Development Program. 7/1/06 - 6/30/09. \$422,733. Role: PI. 5.00%.

Sequencing of Mutations - RET, BRAF, NTRK, and RAS for Correlative Study of AZD6244 as part of the Clinical Trial NCI7918.
National Cancer Institute. 2/15/08 - 2/14/09. \$43,308. Role: PI. 5.00%.

The Integration of Chemotherapy in the Curative Treatment of Head and Neck Cancer: Biologic Principles, Changing Paradigms, and New Therapies. Completed Educational Grant ID: 22364.
Sanofi-Aventis, Invited Speaker: Marshall Posner, MD. Lineberger Comprehensive Care Center. 8/16/2008.
\$4,465. Role: PI. 5.00%.

Program Title: Head and Neck Cancer: Standards and Myths. Completed Educational Grant ID: 004515.
Genentech, Invited Speaker: Ezra Cohen, MD. Lineberger Comprehensive Cancer Center. 1/24/08 - 1/25/08.
\$4,375. Role: PI. 5.00%.

Tumor Genomics in a Well-Annotated Clinical Cohort of Lung Cancer Patients.
National Institutes of Health, Loan Repayment Program (LRP). 9/1/03 - 7/1/07. Role: Co-Investigator. 5.00%.

K-Ras mediated Relapse and Metastasis in Non-Small Cell Lung Cancer: Use of Tissue Microarray to Determine Prognostic Markers.
University of North Carolina at Chapel Hill, Lineberger Comprehensive Cancer Center. 7/1/06 - 6/30/07. \$50,000.
Role: Co-Investigator. 5.00%.

Development of an Immunohistochemical Assay for the Prediction of Cisplatin Response in Squamous Cell Carcinoma of the Head and Neck.
University of North Carolina at Chapel Hill, Lineberger Comprehensive Cancer Center. 7/1/05 - 6/30/06. \$25,000.
Role: PI. 5.00%.

Clinical Trials- Active

A Randomized, Double-Blind, Placebo-Controlled Study Chemotherapy Plus Cetuximab in Combination with VTX-2337 in Patients with Recurrent or Metastatic SCCHN. Institutional PI for National Trial. 12/18/14 – 12/19/17. Pharmaceutical Research Associates (PRA). VRXP-A202. \$130,806.

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Clinical Trials- Completed

Phase I/II Trial of Cediranib Alone or Cediranib and Lenalidomide in Iodine 131- Refractory Differentiated Thyroid Cancer. Institutional PI for National Trial. 6/15/13 – 6/16/17. National Cancer Institute. NCI8317. \$46,780

(IMCL-CP01-0861) Phase II Study to Evaluate the Pharmacokinetics and Drug-Drug Interaction of Cetuximab and Cisplatin in Patients with Recurrent or Metastatic Carcinoma of the Head and Neck. Institutional PI for National Trial. 5/21/10 – 5/20/17. Eli Lilly Research Laboratories. I4E-MC-JXBA. \$266,045.

A Phase II, Open-Label, Randomized Study of MEHD7954A Versus Cetuximab in Patients with Recurrent/Metastatic Squamous Cell Carcinoma of the Head and Neck Who Have Progressed During or Following Platinum-Based Chemotherapy. Institutional PI for National Trial. 11/15/12 – 11/14/14. Covance Inc. GO28076. \$100,081.

Multi-Center Randomized Phase II Study of Erlotinib, Cisplatin and Radiotherapy versus Cisplatin and Radiotherapy in Patients with Stage III and IV Squamous Cell Carcinoma of the Head and Neck. Institutional PI for National Trial. 7/16/06 - 7/15/13. Genentech. OSI3602s. \$64,280.

Phase II Trial of Dasatinib (BMS 354825) for Recurrent or Metastatic c-KIT Expressing Adenoid Cystic Carcinoma and for Non-Adenoid Cystic Malignant Salivary Tumors. Institutional PI for National Trial. 11/16/09- 11/15/12. H. Lee Moffitt Cancer Center and Research Institute. NCI 8271. \$62,129.

Phase II Randomized Trial of the Combination of Cetuximab and Sorafenib or Cetuximab and Placebo in Patients with Refractory, Recurrent and/or Metastatic Squamous Cell Carcinoma of the Head and Neck. Institutional PI for National Trial. 9/21/09 - 9/20/12. H. Lee Moffitt Cancer Center and Research Institute. NCI 8070. \$79,526.

A Randomised, Double-Blind, Placebo-Controlled, Multi-centre, Phase III Study of Post-Operative Adjuvant Lapatinib or Placebo and Concurrent. PI. 8/3/09-8/2/12. GlaxoSmithKline, Inc. EGF102988. \$233,416.

Prospective, Longitudinal, Multicenter, Descriptive Registry of Patients Receiving Therapy Other Than Surgical Resection. Institutional PI for National Registry. 7/6/06 - 7/5/12. Imclone Systems. MED05-2462. \$106,300.

A Randomized, Open label Phase II Study of BIBW 2992 vs Cetuximab (Erbix) in Patients with Metastatic or Recurrent Head and Neck Squamous Cell Carcinoma. Institutional PI for Multicenter National Trial. 11/6/08 - 11/5/11. Boehringer Ingelheim Pharmaceuticals, 1200-28. \$89,614.

Randomized Phase II Study of Bevacizumab/Tarceva and Tarceva/Sulindac in Squamous cell Carcinoma of the Head and Neck. Institutional PI for National Trial. 7/6/07 - 7/5/10. Dana-Farber Partners. OSI3597s. \$40,000.

A Randomized Phase 3 Study of Pemetrexed in Combination with Cisplatin versus Cisplatin Monotherapy in Patients with Recurrent or Metastatic Head and Neck Cancer. Institutional PI for National Trial. 11/8/06- 4/15/10. Eli Lilly and Co. H3E-MC-JMHR. \$55,279.

A Phase II Study of AZD6244 in Iodine-131 Refractory Papillary Thyroid Carcinoma and Papillary Thyroid Carcinoma with Follicular Elements. Overall PI for International Multicenter Trial. 10/15/06 - 3/25/10. National Cancer Institute. NCI7918. \$46,780.

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Phase III, Randomized, Double-blind, Placebo-controlled Study to Evaluate the Efficacy and Safety of Weekly Doses of Palifermin (Recombinant Human Keratinocyte Growth Factor, rHuKGF) for the Reduction of Oral Mucositis in Subjects with Advanced Head and Neck Cancer Receiving Radiotherapy with Concurrent Chemotherapy (RT/CT). Institutional PI for National Trial. Complete: 2009. AMGEN Inc. 20020402. \$43,020.00.

Phase II Trial of Hyperfractionated Intensity Modulated Radiotherapy with Concurrent Weekly Cisplatin for Stage III and IVa Head and Neck Cancer. Institutional PI for National Trial. Complete: 2007. NCI03018. \$9,000.

A Phase II Study of GW572016 in Recurrent and/or Metastatic Adenoid Cystic Carcinoma, and Other EGFR- and/or erbB2-expressing Malignant Tumors of the Salivary Glands. Institutional PI for National Trial. Complete: 2005. NCI6701. \$19,500.

Patents

Methods for Head and Neck Cancer Prognosis, **D. Neil Hayes**, Vonn Walter, Matthew Wilkerson, Ni Zhao, 6/17/2013, International Pending, PCT/US2013/046136, UNC12004WO, 12-0154

LKB1 Levels and Brain Metastasis from Non-Small-Cell Lung Cancer (NSCLC), **D. Neil Hayes**, Ni Zhao, 4/16/2013, United States Pending, 13/863,842, UNC13002USU, 12-0113

Molecular Diagnosis and Typing of Lung Cancer Variants, **D. Neil Hayes**, Philip Bernard, Charles Perou, 12/1/2009, United States Pending, 12/602,649, UNC10004USU, 07-0108

Professional Service

State, National, International Offices or Committees

| | |
|--------------|--|
| 2010-Present | The Cancer Genome Atlas, National Co-Chair for Head and Neck Cancer. |
| 2006-Present | The Cancer Genome Atlas, National Co-Chair for the Data Analysis Subgroup. National Cancer Institute and National Human Genome Research Institute sponsored U24 consortium. |
| 2015-2017 | NCI Head and Neck Steering Committee. Metastatic/Recurrent Disease Task Force. |
| 2013-2015 | American Lung Association, Cancer Expert Medical Advisory Panel. |
| 2013 | Alliance for Clinical Trials in Oncology Translational Research Program, Alliance Sequencing Committee. |
| 2012 | The Cancer Genome Atlas, Conference Organizer: Head and Neck Cancer Face to Face. Chapel Hill, NC. September 19-20, 2012. |
| 2011 | The Cancer Genome Atlas, Conference Organizer: Lung Squamous Cell Carcinoma Face to Face. Chapel Hill, NC. May 2-3, 2011. |
| 2009-2011 | American Society of Clinical Oncology Scientific Program Committee: Head and Neck Track. |
| 2008-2009 | International Cancer Genome Consortium: Tissue and Clinical Annotation Working Group. |
| 2008 | The Cancer Genome Atlas, Conference Organizer: Glioblastoma Gene Expression Analysis Face to Face. Chapel Hill, NC. March 10-11, 2008. |

Editorial Appointments

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| 2015-Present | <i>Journal of Clinical Oncology</i> , Editorial Board. |
| 2010-Present | American Journal of Cancer Research: Senior Member of Editorial Board. |
| 2014 | American Society of Clinical Oncology, Educational Book Expert Panel. |

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University of North Carolina at Chapel Hill- Committees

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| 2014-Present | University of North Carolina at Chapel Hill, Lineberger Comprehensive Cancer Center, Institutional Review Board (IRB). |
| 2012-Present | University of North Carolina at Chapel Hill, Lineberger Comprehensive Cancer Center, Oncology Protocol Review Committee (PRC). |
| 2010-Present | University of North Carolina at Chapel Hill, Lineberger Comprehensive Cancer, Clinical Trials Center Protocol Office Executive Committee (POEC). |
| 2012 | University of North Carolina at Chapel Hill, Lineberger Comprehensive Cancer Center, Pagano Award Selection Committee. |
| 2012 | University of North Carolina at Chapel Hill, Fundraising Committee for the University/Cancer Center, Member. |
| 2011 | University of North Carolina at Chapel Hill, MD/PhD Admissions Committee: Ad hoc Reviewer. |
| 2009 | University of North Carolina at Chapel Hill, Lineberger Comprehensive Cancer, Center Data Warehouse Governance Committee. |
| 2006-2008 | University of North Carolina at Chapel Hill, Lineberger Comprehensive Cancer, Center Protocol Audit Committee. |
| 2006-2008 | University of North Carolina at Chapel Hill, Lineberger Comprehensive Cancer, Center Web Site Committee. |

Other Administrative Activities

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| 2011-Present | University of North Carolina at Chapel Hill, Lineberger Comprehensive Cancer Center Head and Neck Cancer Clinical Trials “Pod” leader. |
| 2005-2011 | University of North Carolina at Chapel Hill, Tumor Registry, Medical Director. |

Certifications, Boards, Experience, and Professional Membership

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| 2018-Present | Member, Developmental Therapeutics Radiation Therapy (DTRT) Subcommittee |
| 2016-Present | Member, Translational Science (TS) Liason to the NRG Oncology Head and Neck Disease Site Committee (HNC) |
| 2016-Present | Member, Molecular Tumor Board (MTB) for the American Society of Clinical Oncology (ASCO)'s Targeted Agent and Profiling Utilization Registry (TAPUR) Study. |
| 2006-Present | Member, American Association of Cancer Researchers. |
| 2005-Present | Member, Lineberger Comprehensive Cancer Center. |
| 2004-Present | Member, Carolina Center for Genome Sciences. |
| 2001-Present | Member, American Society of Clinical Oncology. |
| 1999-Present | Member, American College of Physicians. |
| 2005 | Board Certification Medical Oncology. |
| 1999-2005 | Member, American Medical Association. |
| 1999-2005 | Member, Massachusetts Medical Society. |
| 2001-2003 | Member, American Public Health Association. |
| 2000 | Board Certification Internal Medicine. |
| 2000 | University of Rochester Continuing Education Certification in Protecting Study Volunteers. |
| 1997-2000 | Member, Ancillary Services Support Committee, Boston University School of Medicine. |

Community Engagement and Education

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| Fall 2015 | Chemo Care. Northside Elementary School, Chapel Hill, NC. 5 th Grade Class. |
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| Spring 2015 | Introduction to Genetics. Northside Elementary School, Chapel Hill, NC. 4 th Grade Class. 12 Contact hours including 3-hour field trip to UNC. |
| Fall 2014 | Introduction to Genetics. Northside Elementary School, Chapel Hill, NC. 4 th Grade Class. |

Ad hoc Scientific Reviewer

American Journal of Clinical Oncology
Bioinformatics
Biostatistics
BMC Bioinformatics
BMC Medical Genomics
BMC Systems Biology
British Journal of Cancer
Cancer Cell
Cancer Research
Clinical Cancer Research
EORTC Protocol Review Committee PRN Reviewer
European Journal of Cancer
Genes, Chromosomes and Cancer
Genome Biology
Journal of Cancer Research and Clinical Oncology
Journal of Clinical Investigation
Journal of Clinical Oncology
Journal of Molecular Diagnostics
Journal of the American Medical Association
Journal of Thoracic Oncology
Lung Cancer
Mayo Clinic Proceedings
Molecular Cancer
Molecular Cancer Research
Molecular Cancer Therapeutics Molecular Carcinogenesis
Nature
Nature Medicine
Nature Reports
Oral Oncology
PLOS One
Science
Science Translational Medicine
Supportive Care in Cancer

Research Statement

Overview

In my years of employment as an Assistant and Associate Professor in the Department of Medicine at the University of North Carolina, Chapel Hill I have pursued a vision of scholarship, service, and teaching centered in the concept of personalized medicine. The foundation of this vision is excellence in clinical care, from which I have started and grown one of the most productive clinical trials programs in the country in head and neck cancer. In parallel, I

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have developed tissue repositories and data systems that have allowed my lab to make critical observations in cancer, which include diagnostic tests in the area of lung cancer that carry a provisional patent and a startup company. More broadly, my lab has taken a leadership role in the national cancer community as I have assumed the co-PI role for UNC's participation in the Cancer Genome Atlas (TCGA), the pivotal cancer project of our generation. Each component of my work accompanies successfully garnered funding and includes many educational and collaborative opportunities across the Cancer Center and the University.

Clinical Practice and Clinical Trials

On my arrival to UNC, there was already a large clinical volume of head and neck cancer, yet there was no senior leadership from the division of medical oncology and no clinical trials. With the support of the Cancer Center and under my direction, there have been dramatic advances in the level of care. These include the addition of a multidisciplinary nurse to coordinate care exclusively for patients receiving chemotherapy and radiation, a second full time scheduler, a clinical trials nurse, a nurse practitioner, and an oncology dietitian.

Recognizing that the volume of patients, complexity of care, and level of comorbidities were a frequent source of complications and medical errors, I instituted a second weekly tumor board focused on patients in active chemotherapy treatment. The goal of this conference was to manage the 75-100 patients actively being treated by multiple providers. With the level of support and functionality described above, the head and neck cancer group has been able to recruit Drs. Jared Weiss and Juneko Grilley-Olson to work with head and neck cancer patients, whereas previously the responsibilities were too substantial without this level of support. Currently, an attending physician with primary expertise in this disease now sees every patient. We see between 200-300 new patients yearly, which represent more than 1/3 of all advanced head and neck cancer seen in the state of North Carolina.

In parallel, I oversee the development of database infrastructure supported by the Cancer Center to help manage our patient population. While the electronic medical record supported by the hospital manages individual patient data, there is no flexible hospital data structure for managing groups of patients, which is required by our two tumor boards. I have assumed management of a previously existing system that now manages the site, clinical stage, referring physician, and prescribed treatment for every patient in our practice. This system helps the nursing staff to usher the patients through the many components of their cancer care, and manages the tumor board lists for both of our weekly meetings. It was recently associated with a 4-5 hour decrease in workload, per nurse, per week. Data from this system is used to characterize novel populations and report outcomes. The program is notable for its efficiency, and many of its members have received awards for their work.

I have led the creation of an effective clinical trials program either with trials open or in the regulatory process for every major patient population that we see. We lead in-patient accrual for many of our trials and one of the greatest accomplishments is our continued place in the top five institutions for accrual in the only open head and neck cancer registry ever completed, with over 250 patients accrued over 3 years to a national database of approximately 3000 patients and >100 institutions contributing. Our success supports at least three FTEs in the protocol office, and has generated many hundreds of thousands of dollars of trials-related revenue for the protocol office and my lab.

One of my most significant contributions, I feel, is the two trials for which I am the PI with correlative studies and budgets to evaluate genomic biomarkers. It is these studies, and the biomarkers included that represent the connection between my clinical practice, clinical trials portfolio, and the translational work done in my lab. In further support of the translational research, I have supported an open tissue banking protocol.

While my clinical practice has primarily focused on head and neck cancer, I continue to see patients and remain involved in the lung cancer program as well. The database infrastructure used in the head and neck clinic has been modified to a more generic form and in the coming year will be fully implemented in the lung cancer program as well as several other sites.

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Translational Lab

My lab has a primary translational focus, which requires the assembly of tissue repositories with high-quality clinical data in conjunction with novel molecular assays to interrogate the molecular basis of cancer. The final key component to my lab's work is to evaluate these tissue resources in light of clinically relevant outcomes. We have assembled several of the largest genomics datasets in the world for the tumors we study. Our genomic resources include gene expression arrays, single nucleotide polymorphism arrays for the detection of tumor genotypes and alterations of copy number, arrays for the detection of alterations in DNA methylation, miRNA expression arrays, and tissue microarrays. In total, we have profiled approximately 1000 tumors with various combinations of these technologies. We have complimented the genomic characterization of these tumors with further technologies, most notably by detecting a number of novel and previously described tumor specific mutations. Most recently we have transitioned to novel "deep sequencing" technologies such as the Illumina Solexa platform. Numerous of these reports were published, are in-press and review. My work in molecular profiling in lung and head and neck cancer has a wide range of potential clinical utility, including the ability to predict clinical outcomes for which there are currently no existing clinical diagnostic tests. The clinical outcomes of interest include the ability to predict prognosis in untreated patients, and the probability of brain metastasis. By incorporating our lung cancer work into the basic science section of the NCCN Cancer treatment guidelines, we were granted a provisional patent supported by the University for a Diagnostic Assay based on a range of technologies. Collaborative efforts with model systems experts, Scott Randell (Cell and Molecular Physiology) and Scott Hammond (Cell and Developmental Biology), have generated a number of preliminary experiments related to the developmental basis of lung cancer subtypes that has resulted in American Recovery and Reinvestment Act (ARRA) funding.

We have performed a number of focused assays to characterize tumor behavior, most notably is our characterization of the clinical importance of several genes in the mammalian target of rapamycin (mTOR) pathway in lung cancer. We are the principle collaborators in describing mutations of the tumor suppressor gene *STK11* in lung cancer, perhaps the most frequently mutated gene in lung adenocarcinoma. We have made additional and potentially transformative clinical observations in association with mutations of this gene, as well as described other alterations of the pathway, including mutations of *TSC1/2*.

In an even more focused study, we investigated a series of patients treated at UNC in which couples, who were both diagnosed with tonsil carcinoma within a very short span of each other. By characterizing the tumors from each couple, we showed that each member of a pair harbored identical viruses that were nonetheless distinguishable from other variants of the virus. To our knowledge, these are the first reported cases of humans sharing both the identical virus and the identical cancer.

Finally, as co-PI, we successfully competed for one of a small number of Genome Characterization Center grants (\$15 million over 5 years) in which we will characterize the gene expression patterns of over 20,000 human tumors. This project has already yielded revolutionary insights into the first tumors sequenced, including a report for which I am the senior author published in *Cancer Cell*.

Infrastructure

Much of the groundwork for the research described above involved the development of infrastructure that has not previously existed at UNC and which exists in few places around the world. As the Clinical Director of Bioinformatics at the Cancer Center, I have overseen the development of a number of resources. Most notably, I have been the architect of the Cancer Center's Data Warehouse which coordinates a variety of databases related to cancer patients and genomic assays, and convened the data governance committee overseeing data usage. In addition, I am the clinical director of the UNC tumor registry and a member of a variety of committees related to development of novel diagnostics including the Rapid Adoption Molecular diagnostics (RAM) lab sponsored by the UCRF. I am the core co-director of the Bioinformatics and Genomics Core. Additionally, I am the architect of the generic cancer database which is a common resource available to anyone in the Cancer Center wishing to manage a clinical database.

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Teaching

As do all my colleagues, I have clinical teaching responsibilities for the fellows and residents on the wards as well as a dedicated three month mentorship in my clinic for all fellows. In my lab, I have supported over 20 students, residents, medical and postdoctoral fellows as well as recent collaboration with the computational sciences where I have acted as co-mentor for biostatistics and statistics students and as a committee member for two PhD candidates.

Funding

Each aspect of my career has been well funded. Early funding includes multiple clinical trials in head and neck cancer, a Joan's Legacy Foundation grant for lung cancer, multiple Lineberger awards, and a K12 scholar award. Recent funding such as the American Recovery and Reinvestment Act grant looking at biological determinants in lung cancer and the multi-million dollar TCGA grant will give the lab a place at the forefront of cutting edge cancer research.

Future Goals

While I stand proudly behind a record of success in my years at UNC, my enthusiasm for the future dwarfs the accomplishments to date. We are well placed to be part of the continued technology revolution as we leverage TCGA and other collaborations to use more powerful tools for this process. Collaborations with the model systems experts will look for causation and with pathology will allow us to implement clinical diagnostics from these findings. My clinical trials expertise will allow us to clarify the impact on decision-making. Work in cancer profiling through TCGA will exponentially expand the applicability of all these findings to other tumors. With my previous and current work, I am well positioned to continue the landmark work that has begun.

Teaching Statement

Overview: As a physician-scientist I have the privilege of working with a wide variety of students, trainees, and peers with whom I share the lifelong quest for knowledge. As documented in my CV, I have played a key role (project mentor, advisor, thesis committee member, or other) in the training of at least 30 trainees in my time at UNC. Nearly all of these students remain in their chosen field, including 3 trainees **this year** who assumed academic research positions at major universities (Dr. Ni Zhao at Johns Hopkins in Biostatistics, Dr. Vonn Walter in Biostatistics at Penn State University, and Dr. Matt Wilkerson in Anatomy, Physiology & Genetics at the Uniformed Services University in Washington, DC). Many others are in a wide variety of successful careers in clinical care, clinical trials, research, or at high levels of industry. Also documented in my CV are no fewer than 150 invited lectures over the last decade at every level of scholarship. While specifics of the trainees' experiences as well as the lectures are documented in the CV, in the teaching statement, I emphasize my approach to the many students and teaching experiences in which I have participated. Specifically, I will identify a range of teaching opportunities and my approach to each. In general, my teaching style is divided among the 2 types of students with whom I interact: 1) those with whom I have ongoing one-on-one mentoring relationship such as students in the lab, on committees I chair or serve, or fellows in the clinics; and 2) those with whom I have a single point of contact such as attendees of "continued medical education" lectures or other event-based didactic experiences.

In my mentored relationships, beyond mastery of subject content and degree milestones, I emphasize those aspects of a trainee's activities and experience that will promote successful career advancement. Whereas mastery of subject matter can often be delegated to the student and assessed through exams, successful career advancement in my opinion is often more under the control of the advisor. As mentors, we are uniquely placed to abate inexperience and hone skills needed for a career at a time when it is needed most for trainees. Timing can be everything to a student. For example, in mentoring clinical fellows who desire a research career but have no specific research degree or instruction, the path to an academic career can be narrow in the context of the limited time of fellowship. For these fellows, I have emphasized a strategy of adopting 2 projects for their research experience. In the first project, they must work in an area where all of the primary data is already generated such that they can complete initial analysis by

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the end of their second calendar year of fellowship. This allows them the opportunity to present at a national meeting in the spring of their second year and write a paper in the fall of that year. The result is that by the time of job interviews, they will have a submitted paper and a presentation in an area of independent research. These fellows also initiate a second project for which they design the study from start to finish, recognizing that such an endeavor may or may not be complete by the time they are seeking their first academic position. This kind of thinking incorporates the required educational content for future independence but also considers career advancement when it is most needed.

In my more didactic experiences, I interact with a wide variety of audiences from school-aged children, to patients, to business and industry partners, medical experts, graduate students, bench scientists, computational biologists, and many others. As I navigate these diverse audiences I am struck by the range of reactions evoked by the same lecture as a function of the background of the participants and forum of the presentation. In response, I have honed my teaching to emphasize my familiarity with the audience as much as my mastery of the topic each time I walk into the lecture hall. Indeed, by putting myself in the mindset of the attendee and venue as well as asking what 'does this student want to learn at that moment,' I have successfully achieved a rewarding didactic exchange.

Pre-Doctoral Students: Mentoring and teaching pre-doctoral students is one of the most important duties in my career in science. Pre-doctoral students are at the most important time in their professional lives in that many have selected a field in which they want to excel, yet they do not have the knowledge or experience they need to reach that goal. They often have a general sense of their interests but they do not have a concept of what their career will look like in that field. They rarely comprehend the path to career success. It is my duty to guide students towards academic success by respecting and clarifying formal degree milestones. In my lab and in concert with the student and the student's thesis committee, we apply didactic lessons through projects that demonstrate productivity on a timeline appropriate to their department's expectations. I have graduated doctoral students from Departments including Statistics and Operations Research in the School of Arts and Sciences, Biostatistics in the School of Public Health, and the School of Medicine. My students have progressed to postdoctoral fellowships at many outstanding institutions including Harvard, Washington University, and the Fred Hutchinson Cancer Institute. Productivity includes papers, presentations, grants, and other tailored experiences. Additionally, beginning at least one year before completion of their dissertation, I encourage students to prepare for the next phase of their career. As a team we initiate steps to make that transition to independence and success.

Post-Doctoral Students: Post-doctoral students under my guidance have a different set of needs for career success. My focus for these trainees is to develop a set of goals that will advance their training and career. In general, I have trained two types of post-doctoral fellows. The first are purely computational - their goals include deciding between an independent academic path versus service career through industry or similar setting. The second type of postdoctoral trainee is a clinician, often with an advanced research degree, who wishes to expand their skill set in translational genomics. In either case, in consultation with each post-doctoral fellow, we define the set of skills they wish to acquire as well as a project through which these skills can be developed. Some trainees are interested in computational methods related to a specific aspect of computational oncology and others in translational projects with patient outcomes. As the trainee's time unfolds in the lab, my goal is to usher them to successful completion of a project connected to those experiences that will result in success in employment on a time scale consistent with expectations. For example, trainees who envisage an academic career must apply for grants during the post doc to experience this key part of academic life. My former postdoctoral trainees have received grants including NIH F32 training grants. Those trainees who plan on going into industry generally are offered more chances to collaborate on frequent smaller projects in addition to their primary project. Post-doctoral fellows have accepted faculty positions at Johns Hopkins in Biostatistics, Penn State University, the University of North Carolina, the Uniformed Services University in Washington, DC, and many other institutions.

Faculty Mentoring and Peer Teaching: As a physician-scientist, I have had the opportunity to become an expert in a few areas of biomedical research, including cancer genomics and care of patients with tumors of the head and neck. It is therefore my duty to pass this knowledge on to my individual trainees and disseminate relevant portions more broadly through peer teaching. Some responsibility is to my peers in medical oncology - I have spoken widely to continuing medical education forums for oncologists. Where I feel a more solemn responsibility, however, is to go beyond this sphere to engage and learn from a larger community of patients, caregivers, health care workers, scientists, physicians, and other interested parties. It is often in these settings outside my comfort zone where the most meaningful and challenging exchanges occur, fostering new ideas and new collaborations. For example, I have

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spoken at a number of annual conferences in the surgical disciplines or outside the United States and been exposed to very different viewpoints on otherwise familiar topics in my field.

More recently, my years of experience have placed me in a more personal mentoring and leadership positions for other physicians and colleagues on faculty here at UNC, in NC, and nationwide. This relationship is perhaps most important for the junior faculty, who like my trainees, need not only to master the content of their position, but struggle with the timing of career progress. My goal in these relationships is to guide my junior colleagues through the steps and pitfalls that constitute academic progress. This includes considering some of the challenges of research funding, clinical trials strategies, and translational oncology research. For illustration, I often point out to junior faculty the benefits of developing a balanced clinical trials portfolio which includes industry trials, small academic collaborations, cooperative group studies, and investigator-initiated studies. I have included junior faculty on many grants including my current NCI-funded Integrated Translational Sciences Center grant and papers such as a recently submitted review with Dr. Jared Weiss.

Clinical and Other Trainees: As an academic physician, a portion of my time includes supervision of medical students, residents, fellows, and other clinical trainees. Medical education is increasingly regulated by certifying bodies, statutes, and guidelines. It is my goal to stay abreast of and compliant with all relevant local and national norms and requirements at all times, despite their ever-changing nature. Beyond this, there is still room for personal style in the small group and one-on-one setting of medical trainees. I strive to convey the importance of respecting the patients and their autonomy in the medical encounter. While respecting autonomy, the students recognize the difference between “helping patients make the best decision for themselves” versus “asking them to make decisions by themselves.” This process respects autonomy while at the same time develops therapeutic relationships based on scientific evidence. My ultimate aim is that they learn that sacred nature of our relationship with patients, and the responsibility that comes with it.