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Curriculum Vitae

Robert Charles Doebele, M.D., Ph.D.

Associate Professor of Medicine

University of Colorado, School of Medicine

Department of Medicine

Division of Medical Oncology

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**Education and Training**

1989-1993 **Princeton University**, Princeton, N.J. Bachelor of Arts in Molecular Biology, *magna cum laude*. Senior Thesis under the mentorship of Thomas J. Silhavy, Ph.D. studying protein secretion in *E. coli*.

1993-2001 **University of Pennsylvania School of Medicine**, Philadelphia, PA. Graduate of the Combined Degree Program supported by the NIH *Medical Scientist Training Program*. Ph.D. obtained in Immunology under the mentorship of Elizabeth D. Mellins, M.D.

M.D. and Ph.D. degrees conferred simultaneously in May 2001.

2001-2004 **University of Chicago**, Chicago, IL. Internal Medicine Residency Program, Categorical Internship and Residency completed in June 2004.

* 1. **University of Chicago**, Chicago, IL. Hematology/Oncology Fellowship, Focus in *thoracic malignancies* including lung cancer, esophageal cancer and malignant mesothelioma. Laboratory research focused on the role of the Epac/Rap1 pathway in A*ngiogenesis* and *Metastases* under the mentorship of Marsha R. Rosner, Ph.D.

**Academic Appointments**

2007-2008 **Instructor** - Department of Medicine, Section of Hematology/Oncology, University of Chicago Medical Center, Chicago, IL. Member of Thoracic Oncology group with research interest in tumor angiogenesis and metastasis.

2008-2013 **Assistant Professor** of Medicine, Division of Medical Oncology, University of Colorado School of Medicine, Anschutz Medical Campus, Aurora, CO. Thoracic Malignancies Program.

2013-Present **Associate Professor** of Medicine, Division of Medical Oncology, University of Colorado School of Medicine Anschutz, Medical Campus, Aurora, CO. Thoracic Malignancies Program.

2017-Present **Director, Thoracic Oncology Research Initiative**, University of Colorado Cancer Center, Aurora, CO.

**Honors and Awards:**

2018 The American Society for Clinical Investigation, elected as member

2014 Top 5 most cited article of 2012 in *Clinical Cancer Research*

2013 Inventor of the Year, University of Colorado, Anschutz Medical Campus

2013 V Scholar Award from the V Foundation for Cancer Research

2012 The President’s Award for World Class Care (University of Colorado Hospital)

2011 Boettcher Foundation Webb-Waring Biomedical Research Award

2008 ASCO-NCI-EORTC Annual Meeting on Molecular Markers in Cancer Tutorial, Travel Grant Recipient

1. Adolph J. Creskoff Prize (University of Pennsylvania School of Medicine) for meritorious research in Hematology or related field.

**Memberships, Review Sections, Editorships**

2017-Present Clinical Cancer Research, Senior Editor

2005-Present American Society of Clinical Oncology**,** Full Member

2005-Present American Association for Cancer Research, Active Member

2008-Present Protocol Review Monitoring Committee, ad hoc Reviewer

2008-Present International Association for the Study of Lung Cancer, Member

2011-Present Southwest Oncology Group (SWOG), Member

2011-Present Cancer Biology Graduate Program, Faculty

2012-2013 European Society for Medical Oncology (ESMO), Member

**Major Committee and Service Responsibilities**

*International*

2017-2018 19th World Conference on Lung Cancer (Toronto, Canada, 2018), Program Committee for Invited Speakers, Biology Track.

2012-2013 15th World Conference on Lung Cancer (Sydney, Australia, October 2013), Core Program Committee for Mesothelioma.

2013-2015 16th World Conference on Lung Cancer (Denver, CO, September 2015), Local Organizing Committee.

2014-2015 16th World Conference on Lung Cancer (Denver, CO, September 2015), Chair Core Program Committee for Biology, Pathology, and Molecular Testing

*National*

2018-2020 ASCO Annual Meeting Scientific Program Committee - Lung Cancer - Non-Small Cell Metastatic

2016-2017 NCCN NSCLC, Thymic Malignancies, and Mesothelioma Guidelines Committee

2013-2016 NCCN SCLC Guidelines Committee

2014 Co-chair, Plenary Session 5: Mechanisms of Drug Resistance, Third AACR-IASLC Joint Conference on the Molecular Origins of Lung Cancer (San Diego, CA)

2014 Co-chair, FGFR/DDR2/RON/AXL/MER/EPH/TRK Session, 14th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA.

2014-Present SWOG Lung Committee and Lung Working Group

*University and Cancer Center*

2017-Present University of Colorado Lung Cancer SPORE, co-Principal Investigator

2016-Present ORIEN, University of Colorado Scientific Officer

2015-Present Molecular Tumor Board, Founding co-Director

2015-Present Member, Target-based Therapeutics Team (T3; Clinical trial team focusing on biomarker-selected, tumor-type-agnostic clinical trials)

2014-Present Pharmacology Graduate Program, training faculty member.

2014-Present Lung, Head and Neck Program Retreat, Program Committee.

2013-Present Medical Scientist Training Program (MSTP) Faculty

2013-Present Medical Scientist Training Program (MSTP), Admissions Committee

2012-Present University of Colorado Cancer Center, Lung Head & Neck Cancer Program, Developmental Therapeutics Focus Group Lead

2012-Present Cancer Biology Seminar Committee, Chair

2013-Present Cancer Biology Graduate Program, Steering Committee

2012 University of Colorado Postdoctoral Research Day - Poster Judge

2012 University of Colorado Summer Cancer Fellowship Review Committee

2011-2013 COMIRB Panel D, Member

2008-Present University of Colorado Cancer Center, Member

*Department of Medicine*

2011-Present Internal Medicine Physician Scientist Training Program (PTSP) - Interviewer

2008-Present Internal Medicine Residency – Interviewer

2008-Present Hematology/Oncology Fellowship Program - Application Review and Interviewer

**Licensure and** **Certification**:

*Current*

Medical Oncology, Certified by American Board of Internal Medicine (valid until

11/13/2017).

State of Colorado, Physician License DR.0046628 (valid until 04/30/2017)

DEA Substance Control License, available upon request (valid until 6/30/19).

*Past*

State of Illinois, Licensed Physician and Surgeon, License No. 036-111011 (valid until

7/31/2008).

Internal Medicine, Certified by American Board of Internal Medicine (valid until

12/31/2014).

**Inventions, intellectual property and patents held or pending**

*Industry/start-up*

1. Rain Therapeutics, Co-founder and Chair of Scientific Advisory Board.

*Patents and Provisional Patents*

1. Varella-Garcia M**,** Xu, LG, **Doebele, RC**, Le AT. *Detection of Activating RET fusions in*

*Cancer*. PCT/US13/038215, filed 5/19/2013.

1. **Doebele RC**, Varella-Garcia M, and Le AT. *Methods for Diagnosis and Treatment of Cancer*. PCT/US2013/057495, filed 8/30/2013.
   1. 2014 - Licensed to Abbott Molecular
2. **Doebele RC**, Varella-Garcia M, and Le AT. *Activating NTRK1 Gene Fusions Predictive of Kinase Inhibitor Therapy.* PCT Patent Application No. PCT/US15/33528 filed 6/01/2015.
3. **Doebele RC** and Le AT. *Constructs and Methods for Multiplexed Proteomics Analysis in Cells*. Provisional patent filed 10/20/2016. CU TTO Ref. CU4232H-PPA1.
4. **Doebele RC.** *Point Mutations in TRK Inhibitor-Resistant Cancer and Methods Relating to the Same*. Filed in the United States Patent and Trademark Office on October 26, 2016, as application 15/335,378 and International Application No. PCT/US2016/058951, filed October 26, 2016 (the “Application”).
5. **Doebele RC.** *Compounds, Compositions and Methods for Treating or Preventing*

*EGFR-Driven Drug-Resistant Cancers.* New Provisional Patent Application No. 62/556,121, filed September 8, 2017.

* 1. 2018 - Licensed to Rain Therapeutics

*Inventions*

1. CUTO3 cell line. Lung adenocarcinoma cell line harboring *MPRIP-NTRK1* oncogene derived from a malignant pleural effusion
   1. 2014 – Licensed to Chugai Pharmaceutical
   2. 2014 – Licensed to Blueprint Medicine
2. CUTO-3F.29. Lung adenocarcinoma cell line (subclone of CUTO3) harboring *MPRIP-*

*NTRK1* oncogene derived from a malignant pleural effusion.

* 1. 2015 – Licensed to Chugai Pharmaceutical

1. CUTO-3F.36. Lung adenocarcinoma cell line (subclone of CUTO3) harboring *MPRIP-*

*NTRK1* oncogene derived from a malignant pleural effusion.

* 1. 2015 – Licensed to Chugai Pharmaceutical

1. Ba/F3-*MPRIP-NTRK1* cell line
   1. 2015 – Licensed to GVKBio
2. CUTO14 cell line. Lung adenocarcinoma cell line harboring an *EGFR*

p.A767\_V769dupASV mutation (exon 20 insertion).

* 1. 2015 - Licensed to Ariad Pharmaceuticals

1. CUTO17 cell line. Lung adenocarcinoma cell line harboring an *EGFR* p.N771\_H773dupNPH(exon 20 insertion)
2. CUTO18 cell line. Lung adenocarcinoma cell line harboring an *EGFR* p.768\_770dupSVD (exon 20 insertion)
3. CUTO23 cell line. Lung adenocarcinoma cell line harboring a *CD74-ROS1* gene fusion.
4. CUTO27 cell line. Lung adenocarcinoma cell line harboring a *CD74-ROS1* gene fusion.
   1. 2017 - Licensed to Ignyta Pharmaceuticals
5. CUTO28 cell line. Lung adenocarcinoma cell line harboring a *TPM3-ROS1* gene fusion.
   1. 2017 - Licensed to Ignyta Pharmaceuticals.

**Review and Referee Work**

*Invited Manuscript Reviewer*

Annals of Oncology

British Journal of Cancer

BMC Cancer

BMC Immunology

Cancer

Cancer Cell

Cancer Discovery

Cancer Research

Clinical Cancer Research

Drugs

Genes, Chromosomes, and Cancer

Genome Biology

Journal of Clinical Investigation

Journal of Clinical Oncology

Journal of Clinical Oncology – Precision Oncology

Journal of Molecular Biology

Journal of the National Cancer Institute

Journal of Thoracic Oncology

Molecular Cancer Therapeutics

Nature Biomedical Engineering

Nature Medicine

Nature Communications

Neoplasia

New England Journal of Medicine

Oncogene

Oncotarget

Onkologie

Pharmacology and Therapeutics

PLoS One

Proceedings of the National Academy of Science

Science Signaling

Science Translational Medicine

Scientific Reports

*Grant Review Committees/Study Sections*

2017 NIH/NCI ZCA1 TCRB-V O1 S, NCI R03 & Clinical and Translational R21 Study Section

2016 Fondation ARC pour la recherche sur le cancer (France)

2016 RNA Biosciences Initiative Grant Review (University of Colorado)

2016 Ohio Cancer Research Associates Grant, Ad Hoc Reviewer

2015- NIH Special Emphasis Panel F09A-D Fellowships Oncology

2015- Head and Neck Cancer SPORE Review Committee (Internal Advisory Board)

2014 Colorado Clinical and Translational Service Institute (CCTSI), Pilot Review

2012 Department of Defense Congressionally Directed Medical Research Programs (CDMRP), Lung Cancer Research Program (LCRP), Cell and Molecular Biology (CMB), Washington, DC.

2012 Colorado Clinical and Translational Service Institute (CCTSI), Novel Clinical and Translational Methods Development Program, Review Committee

2011 ACS IRG/CU Cancer Center Seed Grant Review Committee

2010 Ohio Cancer Research Associates Grant, Ad Hoc Reviewer

*Data Safety Monitoring Board*

2015-2017 OncoMed, A Phase 1b/2 Study of OMP-59R5 in Combination with Etoposide and Platinum Therapy in Subjects with Untreated Extensive Stage Small Cell Lung Cancer

PINNACLE: Phase 1b/2 Investigation of anti-Notch Antibody Therapy with Etoposide and Platinum Therapy in Small Cell Lung Carcinoma Safety and Efficacy

*Scientific Advisory Board*

2016-Present Green Peptide (Fukuoka, Japan).

**Invited Extramural Lectures, Presentations and Visiting Professorships**

# **Invited Lectures**

*International*

10/18/2017 18th World Conference on Lung Cancer, Yokohama, Japan. Mini Symposium on Novel Molecular Targets (KRAS/MET/Novel Fusions): Druggable or Not?, “Novel Fusions”

06/07/2017 University of Gothenburg, Gothenburg, Sweden. “EGFR signaling mediates persistence following targeted therapy in cancer cells with oncogene fusions.”

12/06/2016 17th World Conference on Lung Cancer, Vienna, Austria. Discussant for ALK-ROS1 in Advanced NSCLC, MA07.09/ MA07.10/ MA07.11, “A 3-pronged attack on ALK resitance.”

10/10/2016 Ariad Symposium: Optimizing Treatmentfor Patients with ALK+ NSCLC Copenhagen, Denmark, “Will mutation testing be standard in the resistant setting?”

08/23/2016 Western Australia University, Perth, Australia. “Role of *ALK* and *ROS1* in Cancer: Diagnosis and Therapeutics.”

08/22/2016 Peter Macallum Cancer Centre Grand Rounds, Melbourne, Australia. “*NTRK*, *MET,* and *RET* oncogenes in cancer.”

08/19/2016 6th Australian Lung Cancer Conference, Melbourne, Australia. “Management of drug resistance in ALK and NSCLC” and “Update on ROS1.”

05/07/2016 Ignyta Investigator Meeting, Prague, Czech Republic. “Targeting oncogenic fusions with entrectinib.”

07/02/2015 Asia Pacific Oncology Summit (APOS), Bangkok, Thailand. “ASCO Updates 2015, Focus on Targeted Therapies” and “Targeting mutations – sequencing options in EGFR and ALK.”

09/18/2014 17th Annual Chinese Society of Clinical Oncology (CSCO), Xiamen, China. “Drug resistance to ALK (and ROS1) inhibitors.”

03/28/2014 4th European Lung Cancer Conference (ELCC), Geneva, Switzerland. “Drug resistance to ALK/ROS1 inhibitors.”

11/08/2013 Ludwig Institute for Cancer Research/Olivia Newton-John Cancer & Wellness Centre. Melbourne, Australia. “Targeting Gene Fusions in Lung Cancer: *ALK*, *ROS1*, *RET* and *NTRK1*.”

10/30/2013 15th World Conference on Lung Cancer. Mini Symposium: Medical Oncology/Biology on Mechanisms of Acquired Resistance to Targeted Therapy. Sydney, Australia. “Resistance to ALK Inhibitors.”

04/20/2013 6th International Conference on Molecular Targeted Therapy in Lung Cancer. Sorrento, Italy. “Drug resistance in *ALK*+ NSCLC.”

03/15/2012 3rd Conference on Therapeutic Resistance in Cancer. Montreal, Canada “Resistance to ALK Inhibitors in Lung Cancer.”

03/15/2012 Invited Speaker for the Mona Zavalkoff Annual Lecture Series on Innovations and Advances in Lung Cancer at the Jewish General Hospital. Montreal, Canada

09/26/2011 European Multidisciplinary Cancer Congress. Stockholm, Sweden

“ALK in NSCLC - Paving the Way for Oncogene-directed Therapy.”

*National*

05/12/2017 Moffitt Cancer Center (Tampa, FL). “Early adaptive resistance mechanisms to oncogene-targeted therapy.”

02/23/2017 17th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA. “A Phase 1/2 Trial of the Oral EGFR/HER2 Inhibitor AP32788 in Non–Small Cell Lung Cancer.”

0223//2017 17th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA. “Are the mechanisms of activation and resistance of gene fusions the same as other drivers?”

11/04/2016 Guardant Health, Redwood City, CA “Oncogene-directed therapy -  
Emerging challenges in drug resistance.”

08/05/2016 17TH Annual International Lung Cancer Congress, Huntington Beach, CA. “1st- and Next-Generation ALK Inhibitors.”

06/10/2016 University of Chicago Medical Oncology Grand Rounds, Chicago, IL. “Refining Oncogene-Directed Therapy: Moving from Sequential Monotherapy TKIs to Upfront Combination Therapies.”

06/05/2016 Oncogenic Tumor Board in NSCLC: Targeting Driver Mutations to Maximize Therapeutic Outcomes, Satellite Symposium at Annual ASCO Meeting in Chicago, IL. “How Do I Best Sequence Therapies for My Patient with ALK-Positive Cancer, Now, and in the Future?”

03/17/2016 Translational Therapeutics Seminar, The James Cancer Center, Ohio State University (Columbus, OH), “Refining oncogene-directed therapy: Moving from sequential monotherapy TKIs to upfront combination therapies.”

02/18/2016 16th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA. “Targeting TRK oncogenes in cancer” and “GSK2849330: anti-HER3 monoclonal antibody.”

10/17/2015 8th Annual Symposium on Personalized Therapies and Best Clinical Practices for Lung Cancer, San Francisco, CA. “The changing ALK Landscape: Integrating second-line therapies into initial therapy and managing patents with CNS involvement.”

10/09/2015       SWOG Fall Meeting, Chicago, IL. "S1300: A Randomized, Phase II Trial of Crizotinib plus Platinum and Pemetrexed versus Platinum and Pemetrexed alone in ALK-positive Non-Squamous NSCLC Patients who have Progressed Systemically after Previous Clinical Benefit form ALK Tyrosine Kinase Inhibitor Monotherapy"

02/21/2015 15th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA. “ROS1, RET, and Trk oncogenes.”

02/21/2015 15th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA. “Entrectinib (RXDX-101): Trk, ROS1, and ALK inhibitor.”

02/21/2015 15th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA. “LOXO-101: pan-Trk selective inhibitor.”

02/20/2015 15th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA. “GSK2849330: anti-HER3 monoclonal antibody.”

09/06/2014 Global Resource for the Advancement of Cancer Education (GRACE) Acquired Resistance Patient Forum, Boston, MA. “[Mechanisms of ALK Resistance & Implications for Treatment](http://cancergrace.org/lung/2014/10/22/ar_forum_alk_resistance_treatment_mechanisms/)”

02/28/2014 University of California San Francisco Division of Hematology/Oncology Grand Rounds. “Targeting Gene Fusions in Lung Cancer: *ALK*, *ROS1*, *RET* and *NTRK1.*”

02/22/2014 14th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA. “Ramucirumab/1121B.”

02/22/2014 14th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA. “Nectin 4/AGS-22MGE.”

02/20/2014 14th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA. “TRK Inhibitors.”

01/09/2014 AACR-IASLC Joint Conference on the Molecular Origins of Lung Cancer (San Diego, CA), Plenary Session 7: Advances in Molecular Targets and Novel Pathway-Based Therapy. A new TRacK in lung cancer: NTRK1 gene fusions as a therapeutic target.”

7/17/2013 MD Anderson Cancer Center, Houston, TX. “Targeting Gene Fusions in Lung Cancer: *ALK*, *ROS1*, *RET* and *NTRK1.*”

06/26/2013 The Cancer Institute of New Jersey, New Brunswick, NJ. “Targeting Gene Fusions in Lung Cancer: *ALK*, *ROS1*, *RET* and *NTRK1.*”

06/01/2013 Beyond Progression: Treating EGFR or ALK-Positive Non-Small Cell Lung Cancer after First-Line Therapy. Education Session, ASCO Annual Meeting. Chicago, IL. “[Biology of Resistance in Anaplastic Lymphoma Kinase-Positive Non-Small Cell Lung Cancer: Treatment beyond Crizotinib Progression](http://meetinglibrary.asco.org/content/78955?media=vm).”

04/23/2013 NCI-CTEP Spring Early Drug Development Meeting. Bethesda, MD. “Drug resistance in *ALK*+ NSCLC (and *ROS1* too).

03/14/2013 Vanderbilt-Ingram Cancer Center, Nashville, TN. “The *ALK* paradigm in NSCLC: An oncogene-centric perspective.”

02/21/2013 13th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA. “ALK, ROS1, RET and BRAF: Science and Resistance.”

02/21/2013 13th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA “ROS1 as target in NSCLC.”

11/10/2012 7th New York Lung Cancer Symposium, New York, NY. “State of the Art for ALK Inhibition.” Continuing Medical Education (CME) event.

10/13/2012 2nd Annual North Texas Multidisciplinary Lung Cancer Symposium, Dallas, TX. “Targeted Therapies in Non-Small Cell Lung Cancer.” CME event.

06/22/2012 Boehringer Ingelheim National Advisory Board on Non-Small Cell Lung Cancer, Philadelphia, PA. “Standards of EGFR Mutation Testing.”

02/23/2012 12th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA “ROS1 as target in NSCLC.”

02/23/2012 12th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA. “ALK in NSCLC: Mechanisms of resistance to crizotinib.”

11/16/2011 Association for Molecular Pathology Annual Meeting, Abbott Molecular Corporate Workshop Day, Grapevine, TX. “ALK gene fusions, crizotinib, and NSCLC.”

02/24/2011 11th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA “MET as a therapeutic target in NSCLC”.

02/24/2011 11th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA. “ROS as target in NSCLC”.

02/25/2011 11th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA. “Ramucirumab (IMC-1121B) NSCLC Studies”.

02/27/2010 10th Annual Targeted Therapies for the Treatment of Lung Cancer, Santa Monica, CA. “Ramucirumab (IMC-1121B), anti-VEGFR-2 MoAb.”

02/11/2008 Oregon Health Sciences University Medical Oncology Seminar, Portland, OR. “A novel role for Rap1 in Angiogenesis.”

11/26/2007 Cleveland Clinic Medical Oncology Seminar, Cleveland, OH. “A novel role for Epac and Rap1 in Angiogenesis.”

10/31/2006 Case Western University Hematology/Oncology Conference, Cleveland, OH. “Epac and Rap1 are Negative Regulators of Angiogenesis.”

*Local*

04/25/2017 University of Colorado Cancer Center Symposium (Aurora, CO), “Resistance to oncogene-targeted therapies: Intrinsic, Acquired, or *Adaptive*?”

09/16/2016 University of Colorado Hematology/Oncology Fellowship Lecture (Aurora, CO). ““Refining Oncogene-Directed Therapy: Moving from Sequential Monotherapy TKIs to Upfront Combination Therapies.”

05/02/2016 International Thyroid Oncology Group (ITOG) (Aurora, CO). “Targeting gene fusions in cancer.”

03/11/2016 Ariad Preceptorship, “Patterns of crizotinib failure”, “Next generation ALK inhibitors other than brigatinib: Efficacy and toxicity and development plans”, and Mechanisms of Resistance to Next Generation ALK Inhibitors, Research Directions and Options.” Denver, CO.

04/23/2015 DW King Endowed Lectureship Event, “Adaptive signaling in oncogene-driven tumor models: A new paradigm to describe drug resistance.”

04/16/2015 Clovis Oncology Preceptorship. “Forms of EGFR mutant progression (CNS, non‐CNS), and biology.” Denver, CO.

04/09/2015 AstraZeneca Preceptorship, “Forms of EGFR mutant progression (CNS, non‐CNS), and biology.” Denver, CO.

03/13/2015 University of Colorado Developmental Therapeutics and Molecular Oncology Combined Retreat, “Lung Cancer Genomics and Personalized Medicine.”

12/16/2014 University of Colorado Cancer Center Seminar Series, “Rethinking Oncogene Addiction: A role for EGFR signaling in gene fusion positive lung cancer.”

10/13/2014 Pharmacology Program Seminar Series, “Evolved Drug Resistance in Oncogene-Driven Lung Cancer.”

05/07/2014 University of Colorado Endocrine Research Conference, "Fusion oncogenes in lung cancer: Biology, diagnostics, drugs, resistance and applications to other cancer types." Aurora, CO.

12/12/2013 University of Colorado Cancer Center, Developmental Therapeutics Program Retreat. “A new TRacK in Lung Cancer:*NTRK1* gene fusions as a therapeutic target.”

12/11/2013 Development Campaign Committee Meeting. “Precision Medicine at the University of Colorado.”

06/07/2012 University of Colorado Department of Medicine, Faculty Conference Research and Innovation, “Know your patients at the molecular level.” Aurora, CO

04/19/2012 University of Colorado Annual Molecular Biology Symposium: Personalized Medicine: Translating the Genome into Health Care, Aurora, CO. “An oncogene-centric view of lung cancer: Lessons learned from EML4-ALK”.

04/10/2012 University of Colorado Cancer Center Symposium, Aurora, CO. “Gene Fusions in Lung Cancer: ALK, ROS1, and RET”.

03/22-23/2012 Boehringer Ingelheim Preceptorship, Denver, CO. “Management by Molecular Status: EGFR“, “Interpretation of the Biomarker Results by the Medical Oncologist” and “Overview of Therapeutic Options (on/off study) – ASCO, CAP, NCCN guidelines re: biomarkers”

03/04/2011 Pfizer Preceptorship, Denver, CO. “ALK Testing Methods” and “Interpretation of Biomarker Results by the Medical Oncologist”.

11/05/2011 Mountain States Cancer Conference, Patient Education Session, Aurora, CO. “Metastatic Lung Cancer.”

10/21/2011 University of Colorado Cancer Biology Seminar, Aurora, CO. "Rethinking lung cancer in the era of molecular oncology".

03/11/2010 University of Colorado Medicine Grand Rounds, Aurora, CO. “Moving Towards a Molecularly-Based Definition of Lung Cancer.” Aurora, CO

11/04/2010 National Shine a Light on Lung Cancer Vigil, Aurora, CO. “Improving Therapy for Lung Cancer Using Personalized Medicine.”

11/06/2010 Mountain States Cancer Conference, Aurora, CO. “Personalized Medicine for Lung Cancer: A new paradigm for classification and treatment.”

03/10/2009 University of Colorado Cancer Center Symposium, Aurora, CO. “Rap1: A Myriad of functions, but a Role in Lung Cancer?”

09/20/2008 Colorado Cancer Day, Aurora, CO. “Breakthroughs in the Treatment of Lung Cancer: SBRT, Molecular Profiling and Novel Drugs in Clinical Trials.”

12/03/2007 University of Colorado Medical Oncology Seminar, Aurora, CO. “A novel role for Rap1 in Angiogenesis.”

10/16/2006 University of Chicago Hematology/Oncology Grand Rounds, Chicago, IL. “Epac and Rap1 are Negative Regulators of Angiogenesis.”

**Media and Other Presentations**

*Media*

1. Tissue-agnostic cancer drug pipeline grows, despite doubts. Nature Reviews Drug Discovery, March 9, 2018. https://www.nature.com/articles/nrd.2018.6
2. Does stronger initial response to cancer treatment predict longer overall survival? Colorado Cancer Blogs, August 14, 2017. http://www.coloradocancerblogs.org/stronger-initial-response-cancer-treatment-predict-longer-overall-survival/?utm\_campaign=shareaholic&utm\_medium=facebook&utm\_source=socialnetwork
3. Tarloxitinib puts tumor-seeking tail on anti-EGFR drug to precisely target lung cancer. Colorado Cancer Blogs. http://www.coloradocancerblogs.org/tarloxitinib-puts-tumor-seeking-tail-anti-egfr-drug-precisely-target-lung-cancer/?utm\_campaign=shareaholic&utm\_medium=facebook&utm\_source=socialnetwork
4. Lung cancer driver ALK-fusion found in melanoma. Eureka Alert. <https://www.eurekalert.org/pub_releases/2017-10/uoca-lcd102317.php#.WfNql1Hbygo.facebook>
5. Dr. Doebele on Significant Findings of Entrectinib in Patients With ROS1+ NSCLC. OncLive, October 18, 2017. <http://www.onclive.com/conference-coverage/wclc-2017/dr-doebele-on-significant-findings-of-entrectinib-in-patients-with-ros1-nsclc>
6. The Impact and Future of Entrectinib in ROS1+ NSCLC. Targeted Oncology, December 15, 2017 <http://www.targetedonc.com/publications/targeted-therapy-news/2017/November-2017/the-impact-and-future-of-entrectinib-in-ros1-nsclc>

*National*

2014 [Research to Practice](https://itunes.apple.com/us/podcast/lung-cancer-update/id160270573?mt=2), Lung Cancer Update, Faculty Participant.

2013 Global Resource for Advancing Cancer Education (GRACE). [How Should We Manage Acquired Resistance with a Single Lesion or More Diffuse Progression?](http://cancergrace.org/lung/2013/08/13/doebele-manage-acquired-resistance/)

2013 Global Resource for Advancing Cancer Education (GRACE). [Most Promising Upcoming New Targeted Agents and Molecular Pathways for Lung Cancer Treatment.](http://cancergrace.org/lung/2013/07/18/doebele-most-promising-targeted-therapy/)

2013 Global Resource for Advancing Cancer Education (GRACE). [What Molecular Markers Do You Prioritize for Molecular Testing in Advanced NSCLC, and Who do you Test?](http://cancergrace.org/lung/2013/03/10/doebele-which-molec-markers-and-who-to-test/)

2012 Medscape Oncology Education– Faculty Discussant on “[EGFR Mutations and Variability of Treatment Response](http://www.medscape.org/viewarticle/767226_audio)” within “An Update on Advances in the Management of Newly Diagnosed Patients with EGFR Mutation-Positive NSCLC”

2011 Global Resource for Advancing Cancer Education (GRACE). Discussant for podcast on Challenging Cases in Lung Cancer

**Advising/Consulting**

10/22/2017 Consultant for Ignyta at EMA Scientific Advise meeting, London, UK.

10/16/2017 AstraZeneca Advisory Board on Immunotherapy, Yokohama, Japan.

10/15/2017 Chair, Ignyta Advisory Board on entrectinib in ROS1, Yokohama, Japan.

07/21/2017 Takeda Preceptorship on brigatinib, Aurora, CO.

07/10/2017 Co-Chair, Ignyta Advisory Board on entrectinib, Chicago, IL

06/23/2017 AstraZeneca Advisory Board on Immunotherapy, Chicago, IL.

06/02/2017 AstraZeneca Advisory Board on Immunotherapy, Chicago, IL.

05/19/2017 Spectrum Pharmaceuticals Advisory Board on Poziotinib, Las Vegas, NV.

04/06/2017 Ignyta Advisory Board – NCCN, Chicago, IL.

02/24/2017 Ignyta Advisory Board on RXDX-106, Santa Monica, CA

11/18/2016 Ariad Preceptorship on brigatinib, Aurora, CO

11/15/2016 Chair, Ariad Regional Advisory Board, Aurora, CO.

11/04/2016 Guardant Health, Redwood City, CA.

08/04/2016 AstraZenecaSteering Committee Advisory Board, Huntington Beach, CA.

06/06/2016 Ariad Advisory Board, Chicago, IL.

06/05/2016 Trovagene Advisory Board, Chicago, IL.

07/03/2015 Pfizer Advisory Board, Bangkok, Thailand.

05/09/2014 Eli Lilly/ImClone Advisory Board, Denver, CO.

06/22/2013 Pfizer, Virtual Advisory Board.

06/15/2013 Boehringer Ingelheim, Advisory Board. Denver, CO.

06/22/2012 Boehringer Ingelheim, Advisory Board. Philadelphia, PA.

**Teaching Record**

*Clinical Teaching*

2011-Present Attending Physician for Medical Oncology Consult Service, University of Colorado Hospital, 4 weeks per year.

2009-2011 Attending Physician for Medical Oncology Inpatient Service and Medical Oncology Consult Service, University of Colorado Hospital, 4 weeks per year.

2008-Present Attending Physician in Medical Oncology, Lung Cancer Program, Anschutz Cancer Pavilion, one full clinic day per week.

*Classroom Teaching*

2016 MSTP Advanced Topics (IDPT7652), Marlie Fisher

2015-Present MSTP Molecules to Medicine (M2M)

2015-Present PHCL7620 – Principles of Pharmacology, "Inhibiting Receptor Tyrosine Kinases in the Clinic", University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO

2012-Present CANB7600 – Cancer Biology, "Inhibiting Receptor Tyrosine Kinases in the Clinic", University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO

2011 MED6626 - Molecular Biology of Cancer, “Molecular Targeted Therapies in Lung Cancer”, University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO

2009-2014 MED8029 - Applied Clinical Pharmacology Course, “Personalizing Therapy for Lung Cancer”, University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO

2011-2014 PHRD6750 - Integrated Organ Systems 6, “Pathophysiology of Lung Cancer”, University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO

2009-2013 University of Colorado Fellows Conference, various topics including “Targeted therapies in lung cancer” and “Anti-angiogenic therapy in lung cancer”, University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO

2010-2011 University of Colorado Radiation Oncology Conference, “Targeted Therapies in Lung Cancer”, University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO

2010-2012 Student Cancer Research Fellowship Lecture Series, “*In Vitro* Models of Cancer”, University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO

**Training/Mentorship**

*Residents/Fellows*

2017-Present Anastasios Dimou, MD, Investigational Cancer Therapeutics - Thoracic Oncology Clinical and Translational Research Fellow, University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO.

* + - Awarded 2018*AACR-CCF of ASCO Young Investigator Award.*

2017-Present Tejas Patil, MD, Hematology Oncology Fellow, University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO.

2014-2017 Caroline E. McCoach, MD, PhD, Hematology Oncology Fellow, University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO.

* + - Current Position: Assistant Professor, University of California San Francisco

2014-2016 Tejas Patil, MD, Internal Medicine Resident, University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO.

2011-2013 Eamon M. Berge, MD, Hematology/Oncology Fellow, University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO. Primary Clinical and Lab Mentor.

* + - Current Position: Kaiser Permanente, Colorado

2011-2012 Andrew J. Weickhardt, MD, Senior Lung Cancer Fellow, University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO. Clinical Co-mentor (with D. Ross Camidge, MD, PhD).

* + - Current Position: Medical Oncologist, Senior Clinical Research Fellow, Olivia Newton-John Cancer Research Institute

2010-2011 Christopher J. Sumey, Internal Medicine Resident, University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO. Clinical Research Project.

* + - Current Position: Hematologist/Oncologist, Sanford Cancer Center

2008-2009 Scott A. Kono, Hematology/Oncology Fellow, University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO. Clinical Co-mentor.

* + - Current Position: Kaiser Permanente, Colorado

*Post-doctoral Fellows*

2014-2016 Karen Ryall, PhD, T32 Mentor Committee

* + - Current Position: Biostatistician II, Flagship Biosciences

2014-2016 Trisha Sippel, PhD T32 Mentor Committee

* + - Current Position: Post-doc, Fred Hutchinson Cancer Center

2011-2014 Amanda B. Pilling, PhD, Postdoctoral Fellow Doebele Lab.

* + - Current Position: Research Scientist, Henry Ford Cancer Insitute

2011-2013 Kurtis D. Davies, PhD, Postdoctoral Fellow Doebele Lab.

* + - Current Position: Instructor, Department of Pathology, University of Colorado

*Graduate Students*

2017 Opponent for thesis defense of Ganesh Umapathy, University of Gothenburg, Gothenburg, Sweden.

2017-Present Nan Chan, Pharmacology PhD candidate, mentor for thesis project.

2017 Logan Taylor, Pharmacology PhD candidate, Winter Rotation.

2016 Nan Chan, Pharmacology PhD candidate, Fall Rotation.

2016 Marlie Fisher, MSTP and Cancer Biology PhD candidate, Summer Rotation.

2016-Present Natalia Gurule, Cancer Biology PhD candidate (Heasley Lab), Thesis Committee

2016-Present Bonnie Bullock, Cancer Biology PhD candidate (Nemenoff Lab), Thesis Committee

2015-Present Laura Schubert, Cancer Biology PhD candidate, mentor for thesis project.

* + - Awarded NRSA (F31) in 2018

2015-Present Jeff Kwak, Cancer Biology PhD candidate (Nemenoff Lab), Thesis Committee

2014-2017 Sarah Nelson, MSTP and Cancer Biology PhD Candidate, mentor for thesis project.

- Current Position: Medical Student in MSTP.

2014 Katie Mishall, Cancer Biology PhD candidate (Schweppe Lab), Thesis Committee Chair

2014 Katie Mishall, Cancer Biology PhD candidate, Spring Rotation.

2014 Sarah Nelson, Cancer Biology PhD Candidate (Keating Laboratory) – Comprehensive Exam Committee (2014), University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO

2012-2017 Aria Vaishnavi, University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO Cancer Biology PhD Candidate - Mentor for thesis project.

* + - Current Position: Post-doc, Martin McMahon Laboratory, Huntsman Cancer Center

2011-2013 Trisha Sippel, Cancer Biology PhD Candidate (Waziri Laboratory) – Comprehensive Exam Committee (2011), Thesis Committee (2012-present), University of Colorado School of Medicine Anschutz Medical Campus, Aurora, CO

*Medical Students*

2015-Present Robert T. Jones (medical student), Foundations of Doctoring

2013 Seerat Poonia (1st year medical student)

*Summer Students*

2014 Summer Jaquelyn Zoine (undergraduate student), Summer Cancer Fellow

* + - Current Position: Graduate student, Emory University

2012 Summer Mehtap Canastar (medical student), Summer Cancer Fellow

* + - Current Position: Resident, Albert Einstein - Montefiore Medical Center

2010 Summer Blair Murphy (undergraduate student), Summer Cancer Fellow

* + - Current Position: Radiation Oncology Resident, Oregon Health Scinces University

2009 Summer Andrew Wuu (undergraduate student), Summer Cancer Fellow

**Clinical Trials**

*Active*

Title: A Phase 1/2, Open-Label, Multi-Center, First-in-Human Study of the Safety, Tolerability, Pharmacokinetics, and Anti-Tumor Activity of TPX-0005 in Patients with Advanced Solid Tumors Harboring ALK, ROS1, or NTRK1-3 Rearrangements (TRIDENT-1).

Trial ID: COMIRB # 16-2319

Principal Investigator: Robert C. Doebele, MD, PhD

Sponsor: TP Therapeutics

Dates: 4/2017-Present

Title: An Open-Label, Phase 1/1B, Single-Agent Study of RXDX-105 in Patients with Advanced Solid Tumors

Trial ID: COMIRB # 15-2316

Principal Investigator: Robert C. Doebele, MD, PhD

Sponsor: Ignyta

Dates: 1/2017-Present

Title: Early Rebiopsy to Identify Mechanisms and Biomarkers of Tumor Cell Survival Following Epidermal Growth Factor Receptor (EGFR) Tyrosine Kinase Inhibitor (TKI) Targeted Therapy

Trial ID: COMIRB #16-2537

Principal Investigator: Caroline E. McCoach, MD, PhD

(Robert C. Doebele, MD, PhD – Mentor)

Sponsor: Investigator Initiated Trial with University of Lung Cancer SPORE Support

Dates: 5/2016-Present

Title: A Phase 1/2 Study of the Safety, Pharmacokinetics, and Anti-Tumor Activity of the Oral EGFR/HER2 Inhibitor AP32788 in Non-Small Cell Lung Cancer

Trial ID: COMIRB # 16-0208

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: Ariad Pharmaceuticals

Dates: 6/2016-Present

Title: A Phase 1/1b, Open-Label, Multicenter, Repeat-Dose, Dose-Selection Study of CPI-444 as Single Agent and in Combination with Atezolizumab in Patients with Selected Incurable Cancers

Trial ID: COMIRB # 15-2396

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: Corvus Pharmaceuticals

Dates: 5/2016-Present

Title: An Open-Label, Multicenter, Global Phase 2 Basket Study of Entrectinib for the Treatment of Patients with Locally Advanced or Metastatic Solid Tumors that Harbor *NTRK1/2/3*, *ROS1*, or *ALK* Gene Rearrangements (STARTRK-2)

Trial ID: COMIRB # 15-1574

Principal Investigator: Robert C. Doebele, MD PhD (International Trial Lead for TRK cohort)

Sponsor: Ignyta

Dates: 1/2016-Present

Title: A Phase 1/2a, Multicenter, Open-Label Study of Oral RXDX-101 in Adult Patients with Locally Advanced or Metastatic Cancer Confirmed to be Positive for TRKA, TRKB, TRKC, ROS1, or ALK Molecular Alterations (STARTRK-1)

Trial ID: COMIRB #14-2055

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: Ignyta

Dates: 6/2015-Present

Title: D4191C00004:  A Phase III, Open-label, Randomised, Multi-centre, International Study of MEDI4736, Given as Monotherapy or in Combination with Tremelimumab, Determined by PD-L1 Expression, Versus Standard of Care in Patients with Locally Advanced or Metastatic NSCLC (Stage IIIB IV) who Have Received at Least Two Prior Systemic Treatment Regimens Including One Platinum based Chemotherapy Regimen and Do Not Have Known EGFR TK Activating Mutations or ALK Rearrangements (ARCTIC)

Trial ID: COMIRB #14-2054

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: Ignyta

Dates: 6/2015-Present

Title: A Phase 1a/1b Study of the Oral TRK Inhibitor LOXO-101 in Subjects with Adult Solid Tumors

Trial ID: COMIRB #14-0886

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: Loxo Oncology

Dates: 12/2014-Present

Title: Molecular Analysis of Oncogenes and Resistance Mechanisms in Lung and Other Thoracic Cancers.

Trial ID: COMIRB #11-1621

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: Investigator Initiated

Dates: 2/2011-Present

Title: A Retrospective Correlation Between Baseline Demographics, Treatment Response, Clinical Outcome and Molecular Diagnostic Testing in Non Small Cell Lung Cancer.

Trial ID: COMIRB #09-0183

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: Investigator Initiated

Dates: 5/2009-Present

Title: A Phase III, Double-Blind, Randomised, Placebo-Controlled Study to

Assess the Efficacy and Safety of Selumetinib (AZD6244; ARRY-142886) (Hyd-Sulfate) in Combination with Docetaxel, in Patients receiving second line treatment for KRAS Mutation-Positive Locally Advanced or MetastaticNon Small Cell Lung Cancer (Stage IIIB – IV) (SELECT-1)

Trial ID: COMIRB #13-2647

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: AstraZeneca

Dates: 10/2014-2016

*Completed/Closed Trials:*

Title: A Phase 2 Study of Neratinib and Neratinib Plus Temsirolimus in Patients with Non-Small Cell Lung Cancer Carrying Known HER2 Activating Mutations (PUMA-NER-4201)

Trial ID: COMIRB #13-1748

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: Puma Biotechnology, Inc.

Dates: 10/2014-12/2016

Title: A Phase II, Double-Blind, Randomised, Placebo-Controlled Study

to Assess the Efficacy and Safety of Selumetinib (AZD6244;ARRY-142886) (Hyd-Sulfate) in Combination with Docetaxel, Compared with Placebo in Combination with Docetaxel, in Patients receiving second line treatment for Locally Advanced or Metastatic Non Small Cell Lung Cancer (Stage IIIB – IV) (SELECT-2)

Trial ID: COMIRB #14-0084

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: AstraZeneca

Dates: 10/2014-1/2016

Title: A Phase 2 Study of Neratinib and Neratinib Plus Temsirolimus in Patients with Non-Small Cell Lung Cancer Carrying Known HER2 Activating Mutations (PUMA-NER-4201)

Trial ID: COMIRB #13-1748

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: Puma Biotechnology, Inc.

Dates: 10/2014-Present

Title: Comparison of ALK Screening Techniques in Non-Small Cell Lung Cancer.

Trial ID: COMIRB #11-1322

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: Investigator Initiated

Dates: 1/2011-Present

Title: Randomized, Multicenter, Double-Blind, Phase 3 Trial Comparing the Efficacy of Ipilimumab plus Etoposide/Platinum versus Etoposide/Platinum in Subjects with Newly Diagnosed Extensive-Stage Disease Small Cell Lung Cancer (ED-SCLC)

Trial ID: CA184156

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: Bristol-Meyers Squibb

Dates: 4/2013-Present

Title: Phase II trial of dasatinib in subjects with advanced cancers harboring DDR2 mutation or inactivating B-RAF mutation

Trial ID: CA180385:

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: Bristol-Meyers Squibb

Dates: 4/2013-Present

Title: An open label two-stage study of orally administered BKM120 in patients with metastatic non-small cell lung cancer with activated PI3K pathway

Trial ID: CBKM120D2201

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: Novartis

Title: An Open-Label, Multicenter, Randomized, Phase 2 study of a recombinant Human Anti-VEGFR-2 Monoclonal Antibody, IMC-1121B in Combination with Platinum-based Chemotherapy versus Platinum-based Chemotherapy Alone as First-Line Treatment of Patients with Recurrent or Advanced Non-Small Cell lung cancer (NSCLC)

Trial ID: CP12-0917

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: ImClone Systems

Dates: 2/2011-Present

Title: A Phase 1-2 trial of MM-121 in Combination with Erlotinib in Three Groups of Patients with Non-Small Cell Lung Cancer

Trial ID: MM-121-01-101

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: Merrimack Pharmaceuticals

Dates: 4/2012-Present

Title: Multicenter, Randomized, double-blind, Phase III trial to investigate the efficacy and safety of oral BIBF 1120 plus standard pemetrexed therapy compared to placebo plus standard pemetrexed therapy in patients with stage IIIB/IV or recurrent non small cell lung cancer after failure of first line chemotherapy.

Trial ID: 1199.14

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: Boehringer Ingelheim

Dates: 4/2011-6/2011

Percent Effort: 0.02%

Title: A Randomized Discontinuation Phase II Trial of Deforolimus in Non-Small Cell Lung Cancer (NSCLC) Patients with KRAS Mutations.

Trial ID: 021-00

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: Merck

Dates: 2010

Title: A Phase III Randomized Trial of Adjuvant Chemotherapy with or without Bevacizumab for Patients with Completely Resected Stage IB (>4 cm)-IIIA Non-small Cell Lung Cancer (NSCLC).

Trial ID: ECOG 1505

Principal Investigator: Robert C. Doebele, MD PhD

Sponsor: Eastern Cooperative Oncology Group (ECOG)

Dates: 1/2008-6/2008

**Research Support**

*Active*

Title: The role of EGFR as a mechanism of therapeutic resistance in gene fusion positive lung cancer.

Principal Investigator: Robert C. Doebele, MD, PhD

Source: NIH/NCI, 1 R01 CA193935-01A1

Dates: 06/01/2016-5/30/2021

Percent Effort: 23%

Role: PI

Total Costs: $1,958,314

Title: SPORE in Lung Cancer – Project 2: Improving Outcome from EGFR Specific

TKIs Using Rational Combinations

Principal Investigators: Paul A. Bunn, Jr, MD and James Degregori

Source: University of Colorado Cancer Center, Developmental Therapeutics

Program Pilot

Dates: 05/01/2014 – 04/30/2019

Percent Effort: 5%

Role: Investigator

Total Costs: 6.1%

Title: SPORE in Lung Cancer – Administrative Core

Principal Investigators: Robert C. Doebele, MD, PhD and Paul A. Bunn, Jr, MD

Source: University of Colorado Cancer Center, Developmental Therapeutics

Program Pilot

Dates: 05/01/2014 – 04/30/2019

Percent Effort: 5%

Role: PI

Total Costs: 7.6%

Title: A novel hypoxia-induced EGFR inhibitor for the treatment of EGFR exon 20

insertion mutations in lung cancer

Principal Investigator: Robert C. Doebele, MD, PhD

Source: University of Colorado Cancer Center, Developmental Therapeutics

Program Pilot

Dates: 05/01/2017-04/30/2018

Percent Effort: 5%

Role: PI

Total Costs: $50,000

Title: Identifying and targeting mechanisms of residual disease following

oncogene-targeted therapy

Principal Investigators: Robert C. Doebele, MD, PhD and Lynn E. Heasley, PhD

Source: University of Colorado Cancer Center, Lung Head and Neck Cancer

Center Program Pilot

Dates: 05/01/2017-04/30/2018

Percent Effort: 0%

Role: co-PI

Total Costs: $25,000

*Pending*

Title: Determining the role of RET fusion kinases' 5' partner and signaling in response to RET inhibitors

Principal Investigators: Laura Schubert

Source: NIH/NCI (Ruth L. Kirschstein National Research Service Award (NRSA)

Individual Predoctoral Fellowship (Parent F31)

Dates: 05/01/2018-04/30/2019

Percent Effort: 0%

Role: Mentor

Total Costs: $33,060

Title: MHC genotype is shaping the risk for EGFR mutation driven lung cancer

Principal Investigator: Anastasios Dimou, MD

Source: AACR (*AACR-CCF of ASCO Young Investigator Award)*

Dates: 07/01/2018-06/30/2019

Percent Effort: 0%

Role: Mentor

Total Costs: $50,000

*Completed (Past 5 years)*

Title: Induced tumor cell heterogeneity by the sleeping beauty transposon system to generate an improved model of drug resistance.

Principal Investigator: Robert C. Doebele, MD, PhD

Source: DOD/LCRP, W81XWH-15-1-0181

Dates: 09/15/2015-09/14/2016

Percent Effort: 0%

Role: PI

Total Costs: $100,000

Title: Generation of Immunocompetent Oncogene Fusion Murine Models

Principal Investigator: Robert C. Doebele, MD, PhD

Source: NIH/NCI Lung SPORE (P50 CA058187 Bunn, PI)

Dates: 05/01/2016-4/30/2017

Percent Effort: 0%

Role: PI

Total Costs: $50,000

Title: NTRK1 gene fusions as a novel oncogene class and therapeutic target in lung cancer

Principal Investigator: Robert C. Doebele, MD, PhD

Source: V Foundation for Cancer Research, AWD-160178

Dates: 10/1/2013-9/30/2016

Percent Effort: 15%

Role: PI

Title: Evaluation of crizotinib resistance mechanisms to predict pemetrexed sensitivity

Principal Investigator: Robert C. Doebele, MD, PhD

Source: The Hope Foundation

Dates: 1/1/2014-12/31/2015

Percent Effort: 5%

Role: PI

Title: Analysis of the differential kinase input into the RAS/RAF signaling complexes in oncogene-addicted cancer

Principal Investigator: Laura Schubert

Source: CCTSI, TL1 TR001081-03

Dates: 07/01/2015-06/30/2016

Percent Effort: 0%

Role: Mentor

Title: Mechanisms of drug resistance in RET gene fusion positive lung cancer.

Principal Investigator: Robert C. Doebele, MD, PhD

Source: NIH/NCI Lung SPORE (Bunn, PI)

Dates: 09/01/2014 – 12/31/2015

Percent Effort: 10%

Role: PI of Pilot Grant

Title: TRK Inhibitors in Cancer

Principal Investigator: Robert C. Doebele, MD, PhD

Source: Loxo Oncology

Dates: 09/01/2014 – 12/31/2015

Percent Effort: 10%

Role: PI

Title: NTRK1 and NTRK2 fusion genes underlying FISH positive lung and colorectal cancers

Principal Investigator: Robert C. Doebele, MD, PhD

Source: Abbott Molecular

Dates: 09/01/2014 – 12/31/2015

Percent Effort: 1%

Role: PI

Title: Activity of MGCD516 against *NTRK1*-rearranged pre-clinical models of

cancer

Principal Investigator: Robert C. Doebele, MD, PhD

Source: Mirati Therapeutics

Dates: 10/1/2013-9/30/2015

Percent Effort: 3%

Role: PI

Title: Methods for Diagnosis and Treatment of Cancer

Principal Investigator: Robert C. Doebele, MD, PhD

Source: State of Colorado/University of Colorado Technology Transfer Office (Colorado Bioscience Discovery Evaluation Grant)

Dates: 02/19/2013-02/18/2014

Percent Effort: 4%

Role: PI

Title: NTRK1 Gene Fusions as a Novel Target for Therapy in Non-Small Cell Lung Cancer

Principal Investigator: Robert C. Doebele, MD, PhD

Source: Colorado Clinical & Translational Sciences Institute

Dates: 02/19/2013-02/18/2014

Percent Effort: 0%

Role: PI

Title: Paul Calabresi Clinical Oncology Scholar Award

Principal Investigator: Robert C. Doebele, MD, PhD

Source: NIH K12

Dates: 7/2010-8/2014

Percent Effort: 75%

Role: PI

Title: Development, validation and utilization of a novel fluorescence in-situ hybridization (FISH) assay for the routine detection of *RET* gene rearrangements in non-small cell lung cancer (NSCLC)

Co-Investigators: Marileila Varella-Garcia, PhD; Robert C. Doebele, MD PhD; Dara L. Aisner, MD, PhD.; D. Ross Camidge, MD PhD

Source: Bonnie J. Addario Lung Cancer Foundation

Dates: 9/2012-8/2013

Percent Effort: 5%

Role: Co-investigator

Title: Comparison of ALK screening techniques in non-small cell lung cancer (NSCLC)

Principal Investigator: Robert C. Doebele, MD, PhD

Source: Bonnie J. Adarrio Lung Cancer Foundation

Dates: 1/2011-12/2012

Percent Effort: 1%

Role: PI

Title: Targeting resistance in oncogene-driven non-small cell lung cancer (NSCLC)

Principal Investigator: Robert C. Doebele, MD, PhD

Source: Boettcher Foundation Webb-Waring Biomedical Research Award

Dates: 7/2011-6/2013

Percent Effort: 20%

Role: PI

Title: Acquired Resistance to ROS1 Inhibition in Non-small Cell Lung Cancer: Identification of Cellular Mechanisms and Exploration of Alternate Treatment Strategies.

Principal Investigator: Kurtis D. Davies, PhD

Source: Colorado Cancer League

Dates: 7/2012-6/2013

Percent Effort: NA

Role: Mentor

Total Costs: $30,000.00

Title: Targeting pathways that relieve proteotoxic stress to inhibit ALK+ NSCLC cell growth.

Principal Investigator: Robert C. Doebele, MD, PhD

Source: University of Colorado Lung Cancer SPORE

Dates: 5/2012-4/2013

Percent Effort: 1%

Role: PI

Title: Synthetic Lethal in Crizotinib (SLIC): An unbiased genome-wide shRNA screen to identify genes that synergize with crizotinib to induce cell death in ALK+, ROS+, or MET+ NSCLC

Principal Investigator: Robert C. Doebele, MD, PhD

Source: Pfizer Inc.

Dates: 5/2011–12/2012

Percent Effort: 5%

Role: PI

Total Costs: $96,461.00

Title: Exploratory Analysis of Predictive Biomarkers for IMC-1121b.

Principal Investigator: Robert C. Doebele, MD, PhD

Source: ImClone Systems, Inc.

Dates: 1/2011-8/2012

Percent Effort: 10%

Role: PI

Title: Mechanisms of resistance to targeted therapies against ALK, ROS and CMET in NSCLC.

Principal Investigator: Robert C. Doebele, MD, PhD

Source: University of Colorado Lung Cancer SPORE

(Career Development Award)

Dates: 10/2010-4/2012

Percent Effort: 10%

Role: PI

Title: Overcoming primary and acquired resistance to ALK inhibition

Principal Investigator: Robert C. Doebele, MD, PhD

Source: Eli Lilly & Co.

Dates: 12/2010-11/2011

Percent Effort: 10%

Role: PI

Title: ALK in NSCLC: Classification of gene rearrangement partners and development a strategy to identify novel ALK gene abnormalities.

Principal Investigator: Robert C. Doebele, MD, PhD

Source: University of Colorado Lung Cancer SPORE Pilot Grant

Dates: 12/2009-11/2010

Percent Effort: 10%

Role: PI

Title: Generation of an Anti-Angiogenesis Susceptibility Signature in Cancer

Principal Investigator: Robert C. Doebele, MD, PhD

Source: Cancer Research Foundation (Young Investigator Award)

Dates: 1/2008-6/2008

Percent Effort: 10%

Role: PI

Title: Analysis of Epac and Rap1 in Angiogenesis and Tumorigenesis of Breast Cancer

Principal Investigator: Robert C. Doebele, MD, PhD

Source: University of Chicago Breast Cancer SPORE

Developmental Research Project

Dates: 7/2007-6/2008

Percent Effort: 10%

Role: PI

Title: Generation of an Anti-Angiogenesis Susceptibility Signature in Cancer

Principal Investigator: Robert C. Doebele, MD, PhD

Source: University of Chicago Cancer Center

Pilot Project Grant

Dates: 8/2007-3/31/08

Percent Effort: 10%

Role: PI

**Bibliography**

# Original Research Articles (Peer-Reviewed Articles)

1. Porges AJ, Redecha PB, **Doebele R**, Pan LC, Salmon JE, and Kimberly RP. Novel Fc gamma receptor I family gene products in human mononuclear cells. *J. Clin. Invest.* 1992; **90**: 2102-2109. PMCID: [PMC443278](http://www.ncbi.nlm.nih.gov/pubmed/1430234).
2. Flower AM, **Doebele RC**, and Silhavy. TJ PrlA and PrlG suppressors reduce the requirement for signal sequence recognition. *J. Bacteriol*. 1994; **176**: 5607-5614. PMCID: [PMC196762](http://www.ncbi.nlm.nih.gov/pubmed/8083155).
3. Busch R, **Doebele RC**, von Scheven E, Fahrni J, and Mellins ED. Aberrant intermolecular disulfide bonding in a mutant HLA-DM molecule: implications for assembly, maturation, and function. *J. Immunol.* 1998; **160**: 734-743. PMID: [9551909](http://www.ncbi.nlm.nih.gov/pubmed/9551909).
4. Guerra CB, Busch R, **Doebele RC**, Liu W, Sawada T, Kwok WW, Chang MD, and Mellins ED. Novel glycosylation of HLA-DR alpha disrupts antigen presentation without altering endosomal localization. *J. Immunol.* 1998; **160**: 4289-4297. PMID: [9574531](http://www.ncbi.nlm.nih.gov/pubmed/9574531).
5. Doebele RC, Busch R, Scott HM, Pashine A, and Mellins ED. Determination of the HLA-DM interaction site on HLA-DR molecules. *Immunity* 2000; 13: 517-527. PMID: [11070170](http://www.ncbi.nlm.nih.gov/pubmed/11070170).
6. Pashine A, Busch R, Belmares MP, Munning JN, **Doebele RC**, Buckingham M, Nolan GP, and Mellins ED. Interaction of HLA-DR with an acidic face of HLA-DM disrupts sequence-dependent interactions with peptides. *Immunity* 2003; **19**: 183-192. PMID: [12932352](http://www.ncbi.nlm.nih.gov/pubmed/12932352).
7. **Doebele RC**, Pashine A, Liu W, Zaller DM, Belmares M, Busch R, and Mellins ED. Point mutations in or near the antigen-binding groove of HLA-DR3 implicate Class II-associated invariant chain peptide affinity as a constraint on MHC class II polymorphism. *J. Immunol.I 2003;* 170: 4683-92. PMID: [12707347](http://www.ncbi.nlm.nih.gov/pubmed/12707347).
8. Hong J\*, **Doebele RC\***, Lingen MW, Quilliam LA, Tang W, and Rosner MR. Anthrax Edema Toxin Inhibits Endothelial Cell Chemotaxis via Epac and Rap1. *J Biol Chem.* 2007 Jul 6;282(27):19781-7. Epub 2007 May 9. PMID: [17491018](http://www.ncbi.nlm.nih.gov/pubmed/17491018). \*Co-first Authors.
9. **Doebele RC**, Schulze-Hoepfner FT, Hong J, Chlenski A, Zeitlin BD, Goel K, Gomes S, Liu Y, Abe M, Nor JE, Lingen MW, and Rosner MR. A novel interplay between Epac/Rap1 and MEK5/ERK5 regulates thrombospondin to control angiogenesis. *Blood.* 2009 Nov 12;114(20):4592-600. PMCID: [PMC2777131](http://www.ncbi.nlm.nih.gov/pubmed/19710505).
10. Camidge DR, Kono SA, Flacco A, Tan AC, **Doebele RC**, Zhou Q, Crino L, Franklin WA, and Varella-Garcia M. Optimizing the detection of lung cancer patients harboring Anaplastic Lymphoma Kinase (ALK) gene rearrangements potentially suitable for ALK inhibitor treatment. *Clin Cancer Res.* 2010 Nov 15;16(22):5581-90. PMCID: [PMC3395226](http://www.ncbi.nlm.nih.gov/pubmed/21062932).
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39. Hong DS, Farago AF, Brose MS, Burris HA, Dowlati A, Bauer, TM, Taylor M, Shaw AT, Estrada-Bernal A, Le AT, Nanda N, Cox MC, and **Doebele RC**. Clinical safety and activity from a Phase 1 study of LOXO-101, a selective TRKA/B/C inhibitor, in solid-tumor patients with NTRK gene fusions. AACR Annual Meeting 2016 (New Orleans, LA) Abstract CT008.
40. McCoach CE, Le AT, Aisner D, Gowan K, Jones Kl, Merrick D, Bunn PA, Purcell WT, Varella-Garcia M, Camidge DR, **Doebele RC.** Resistance mechanisms to targeted therapies in *ROS1*+ and *ALK*+ non-small cell lung cancer. J Clin Oncol 34, 2016 (suppl; abstr 9065).
41. **Doebele RC**, Banks K, Ihuegbu N, Diaz J, Lanman R, and Blakely C. Clinical utility of ctDNA for detecting ALK fusions and resistance events in NSCLC: analysis of a laboratory cohort. *J Thorac Oncol* 2017 12 (S1): S269. P1.02-057.
42. **Doebele RC**, Horn L, Spira A, Piotrowski Z, Costa D, Neal J, Reichmann W, Kerstein D, Li S, and Jänne P. A phase ½ trial of the oral EGFR/HER2 inhibitor AP32788 in non-small cell lung cancer (NSCLC). *J Thorac Oncol* 2017 12 (S1): S562. P2.06-007.
43. Drilon AE, Liu S, **Doebele R**, Rodriguez C, Fakih M, Reckamp KL, Bazhenova L, Cho BC, Kowack E, Oliver J, Multani P, Ahn M. A Phase 1b study of RXDX-105, a VEGFR-sparing potent RET inhibitor, in RETi-naïve patients with RET fusion-positive NSCLC. Annals of Oncology (2017) 28 (suppl\_5): v605-v649. 10.1093/annonc/mdx440. Abstr LBA19.
44. Schubert L, Le AT, Malkoski SP, Nemenoff R, **Doebele RC**. CRISPR/Cas9 generation of *Ret* and *Ntrk1* fusion oncogenes and novel *in vitro* sgRNA screening method**.** AACR: Advances in Modeling Cancer in Mice (Orlando, FL). Abtr B3.
45. Estrada-BernalA, DoakAE, LeAT, ZhuH, ChenN, SilvaS, SmaillJB, PattersonAV, **DoebeleRC**. Antitumor activity of tarloxotinib, a hypoxia-activated EGFR TKI, in patient-derived lung cancer cell lines harboring EGFR exon 20 insertions. AACR-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics (Philadelphia, PA). Abstr A157.

# Oral Abstracts/Presentations at Meetings (Selected)

1. **Doebele RC.** Mapping of the HLA-DM/-DR Interface. American College of Rheumatology Basic Science Research Conference (San Diego, CA), 1998.
2. **Doebele RC.** Mapping of the HLA-DM/-DR Interface. Keystone Symposium on the Immunogenetics of Human Disease-MHC/TCR and Peptide (Taos, NM), 1998.
3. **Doebele RC**. Epac/Rap1 inhibit endothelial cell chemotaxis and angiogenesis via induction of Thrombospondin-1. Keystone Symposia on Molecular Mechanisms of Angiogenesis in Development and Disease(Vancouver, British Columbia), 2007, in Workshop 3: Vascular Cell Signaling.
4. **Doebele RC**, Sumey CJ, Maxson DA, Lu X, Barón AE, Oton AB, Bunn PA, Varella-Garcia M, Aisner DL, Franklin W, and Camidge DR.Oncogene status predicts patterns of metastatic spread in treatment-naïve lung cancer. Proceedings of the 14th World Conference on Lung Cancer. *J Thorac Oncol* 2011 6 (6): S620. 14th World Conference on Lung Cancer (Amsterdam, Netherlands), Prognostic and Predictive Biomarkers Mini-Oral Session, Abstr #MO16.12.
5. **Doebele RC,** Aisner DL, Le AT, Berge EM, Pilling AB, Kutateladze TG, Weickhardt AJ, Franklin WA, Varella-Garcia M, and Camidge DR. Analysis of resistance mechanisms to ALK kinase inhibitors in ALK+ NSCLC patients. 2012 ASCO Annual Meeting (Chicago, IL)**,** Oral Abstract Session - Metastatic Non-small Cell Lung Cancer.[Abstr #7504](http://meetinglibrary.asco.org/content/69403).
6. **Doebele RC**, Spigel D, TehfeM, ThomasS, ReckM, Verma S, Yurasov S, Camidge DR, BonomiP. A Phase 2 Randomized Open-Label Study of Ramucirumab (IMC 1121B; RAM) in Combination with First-Line Platinum-Based Chemotherapy in Patients (PTS) with Recurrent or Advanced Non-Small Cell Lung Cancer (NSCLC): Final Results from Non-SQquamous (NSQ) PTS (NCT01160744). 15th World Conference on Lung Cancer, Mini Oral Abstract Session: Medical Oncology – NSCLC – Chemotherapy I. Sydney Australia.
7. Vaishnavi A, Keysar S, Smith MA, Glogowska M, Le AT, Varella-Garcia M, Lovly C, Jimeno, A, Jänne PA, Haura EB, **Doebele RC.** EGFR as an early adaptive mechanism of resistance in gene fusion positive lung cancer. Lung Cancer SPORE Workshop 2014, Shady Grove, MD.
8. Patil T, Aisner DL, Noonan SA, Bunn PA, Berge EM, Purcell WT, Camidge DR, Carr LL, and **Doebele RC**. Malignant Pleural Effusions Are Predictive of Peritoneal Carcinomatosis in Patients with Advanced EGFR Positive Non-Small Cell Lung Cancer. *J Thorac Oncol* 2015 10 (9): S274. MINI04.08
9. Varella-Garcia M, Kako SL, Nguyen CM, Saichaemchan S, Ariyawutyakorn W, De S, Keysar SB, Jimeno A, Roncalli M, Santoro A, Toschi L, Le AT, Aisner DL, and **Doebele RC**. FISHing TRK Activation by Gene Rearrangements in Non Small Cell Lung Cancer. *J Thorac Oncol* 2015 10 (9): S246. ORAL37.01
10. Estrada-Bernal A, Le AT, Zhou H, Noonan SA, Aisner DL, Camidge DR, and **Doebele RC**. A Novel Cell Line Model of EGFR Exon 20 Insertion Mutations. *J Thorac Oncol* 2015 10 (9): S341. MINI21.11
11. Le AT, Estrada-Bernal A, Nelson S, Christensen J, and **Doebele RC**. In Vitro and in Vivo Evaluation of the Kinase Inhibitor, MGCD516, in TRK and RET Fusion Cancer Cells. *J Thorac Oncol* 2015 10 (9): S312. MINI14.04
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13. Dziadziuszko R, Le AT, Aisner DL, Wrona A, and **Doebele RC**. ROS1 Resistance to Crizotinib Is Mediated by an Activating Mutation in c-KIT. *J Thorac Oncol* 2015 10 (9): S374. MINI30.08
14. Vaishnavi, Keysar SB, Le AT, Aisner DL, Heasley L, Jimeno A, **Doebele RC**. Adaptive Survival Signaling in Oncogenic Fusion Kinase Addicted NSCLC*. J Thorac Oncol* 2015 10 (9): S214. ORAL21.01
15. Ahn M, Cho BC, Siena S, Drilon A, De Braud F, Krebs MG, John T, Karapetis C, Johnson AD, Chow-Maneval E, Multani PS, **Doebele RC**. Entrectinib in Patients with Locally Advanced or Metastatic ROS1 Fusion-Positive Non-Small Cell Lung Cancer (NSCLC), WCLC Yokohama, Japan. Abstr OA 14.06.
16. **Doebele RC**, Riely GJ, SPira AI, Horn L, Piotrowska Z, Costa DB, Neal JW, Zhang S, Reichmann W, Kerstein D, Li S, Jänne P. First report of safety, PK, and preliminary antitumor activity of the oral EGFR/HER2 exon 20 inhibitor TAK-788 (AP32788) in non–small cell lung cancer (NSCLC). J Clin Oncol 36, 2018 (suppl; abstr 9015).