## BIOGRAPHICAL SKETCH

| NAME: Cho, Yoon-Jae | POSITION TITLE<br>Assistant Professor, Department of Neurology and Neurological Sciences, Stanford University |
|---|---|
| eRA COMMONS USER NAME: yoon-jaecho | |

EDUCATION/TRAINING

| INSTITUTION AND LOCATION | DEGREE | MM/YY | FIELD OF STUDY |
|---|---|---|---|
| Rice University, Houston, TX | B.A. | 08/1990-05/1993 | Chemistry, Anthropology |
| Oregon Health & Science University, Portland, OR | M.D. | 06/1994-062002 | Mol. & Medical Genetics |

**A. Personal Statement**

I am a physician-scientist specializing in Pediatric Neuro-oncology. My lab focuses on the functional annotation of genomes/epigenomes of childhood brain tumors, with a particular emphasis on medulloblastoma and pediatric high-grade glioma (pHGG), two of the most lethal types of brain tumors in children. My lab utilizes a mix of computational, genomic and chemical biology approaches to 1) understand the molecular and cellular basis of brain tumors, 2) generate new treatment strategies for patients diagnosed with these diseases and 3) inform the current and next generation of clinical trials. Current projects include combining genome-wide RNAi with chemical biology and chemical genomic screens to systematically identify vulnerabilities in *MYC*-amplified medulloblastoma. In addition to my lab activities, I serve as co-Chair of the Biology Committee within the Pediatric Brain Tumor Consortium. In this capacity, I help direct the overall tenor of correlative biological studies for clinical trials run through PBTC with the goal of integrating molecular and genomic studies for each clinical trial moving forward.

**B. Positions and Honors**

**Positions and Employment**

2002-2003 Intern, Pediatrics, Children's Hospital of Pittsburgh / UPMC, Pittsburgh, PA
2003-2004 Resident, Pediatrics, Children's Hospital & Research Center Oakland, Oakland, CA
2004-2007 Resident, Neurology, Children's Hospital Boston, Boston, MA
2007-2008 Neuro-oncology Fellow, Children's Hospital Boston/Dana Farber Cancer Institute, Boston, MA
2008-2011 Instructor in Neurology, Harvard Medical School, Boston, MA
2008-2011 Assistant in Neurology, Children's Hospital Neurology Foundation, Inc., Boston, MA
2008-2011 Consultant in Pediatric Oncology, Dana-Farber Cancer Institute, Boston, MA
2008-2011 Affiliate, Broad Institute of Harvard and MIT, Cambridge, MA
2010-2011 Associate Member, Dana-Farber/Harvard Cancer Center, Boston, MA
2011-present Assistant Professor, Departments of Neurology and Neurosurgery, Stanford University, Palo Alto, CA
2011-present Associate Member, Stanford Cancer Institute, Stanford, CA
2011-present Member, Bio-X, Stanford University, Stanford, CA
2012-present Member, Child Health Research Institute, Stanford University, Stanford, CA
2012-present co-Chair, Biology Committee, Pediatric Brain Tumor Consortium

**Honors**

1991-1993 Jones College Fellow in Chemistry, Rice University
1992 American Association of Clinical Chemistry Summer Research Fellowship
1990-1993 President's Honor Roll, Rice Univ, Fall '90, '91, '92, Spring '93
1994-2002 Oregon Medical Research Foundation Laurel MD-PhD Scholar
2002 Fred and Mary Brauti Scholarship, Oregon Health & Science University
2003 Finalist, Gold Foundation Resident Teaching Award, University of Pittsburgh School of Medicine
2007 Young Investigator Award, Pediatric Brain Tumor Foundation
2007 Young Neuroscientist Award, Childhood Neurobiological Solutions
2009, 2010 Faculty Development Award, Shore Program for Scholars in Medicine, Harvard Medical School
2011-2014 St. Baldrick's Foundation, Scholar Award
2011- Beirne Faculty Scholar in Pediatric Neuro-oncology, Stanford University School of Medicine
2012 Philip R. Dodge Young Investigator Award, Child Neurology Society

**Teaching/Advising**

1992-1993 Teaching Assistant, Organic Chemistry Lab, Rice University, TX
2006 Lab Instructor, Human Nervous System and Behavior, Harvard Medical School, MA
2008-2009 Undergraduate research mentor, Harvard College, Cambridge, MA
2012- Undergraduate research mentor, Stanford University, Stanford, CA (mentees: Brian Nguyen '15, Nusi Vue '14, Sabran Massoud '14, Jessie Cho '15, Brianna Balansay '15, Sohee Park '16)
2012-2013 NENS205, Stanford University, Clinical Neuroscience - Brain Tumors module (course director: Katrin Andreasson)
2013 CBIO280, Stanford University, Cancer Biology journal club (course director: Amato Giaccia)
2013 Postdoctoral advisory committee for Jun Ni, PhD (PI: James K. Chen), Alex Brown, PhD (PI: Matthew Scott)
2013 PhD qualification committee member for Wenying Pan, Bioengineering PhD program, Stanford University: (PhD advisor: Stephen Quake)
2013 External PhD thesis committee member for Guus Bol, University Medical Center Utrecht (PhD advisor: Paul van Diest, UMC Utrecht and Venu Raman, Johns Hopkins Univ School of Medicine)

**Postdoctoral trainees**

2008-2012 Shyamal Dilhan Weeraratne, PhD, current position: Senior Scientist, Life Technologies

2012-2013 Sebastien Perreault, MD, current position: Assistant Professor of Neurology, Universite de Montreal and Staff Physician, Ste Justine Hospital, Montreal, Quebec
2011-2014 Furong Yu, PhD, current position: Staff scientist, Systems Biosciences
2012- Yujie Tang, PhD
2012- Sekyung Oh, PhD
2014- Daniel Dever, PhD

**Professional Memberships and Committees**

1994-2002 Medical Society of Metropolitan Portland
1994-2002 Oregon Medical Association
1994-2002 American Medical Association
1994-2002 American Medical Student Association
2002-2004 American Association of Pediatrics
2004- Child Neurology Society, Awards committee member (2012-)
2004- American Academy of Neurology
2010- Children's Oncology Group, CNS committee member (2010-)
2010- Society for Neuro-Oncology
2011- American Association for Cancer Research
2012- Co-Chair, Biology Committee, Pediatric Brain Tumor Consortium

**Other Professional Activities**

2011- Ad hoc external grant reviewer – Cancer Research UK
2011- Ad hoc external grant reviewer – Breast Cancer Campaign
2011- Ad hoc reviewer – Cancer Research
2011- Ad hoc reviewer – Cancer Genetics
2011- Ad hoc reviewer – International Journal of Oncology
2011- Ad hoc reviewer – Journal of Neuro-oncology
2011- Ad hoc reviewer – Cancer Biology and Therapy
2011- Faculty mentor – NINDS/Assoc of Univ Prof of Neurology/Amer Neurol Assoc
2011- Advisory Board, LDE225 development – Novatis Pharmaceuticals Corp.
2012- Ad hoc reviewer – New England Journal of Medicine
2012- Ad hoc reviewer – Pediatric Blood & Cancer
2012- Ad hoc reviewer – PLoS One
2012- Grant reviewer – St. Baldrick's Foundation
2012- Medical Advisory Board – The Nicholas Conor Institute
2012- Ad hoc reviewer – European Journal of Pediatrics
2012- Ad hoc reviewer – Acta Neuropathologica
2012- Grant reviewer – The John McNicholas Foundation
2012- Applicant reviewer, Stanford University School of Medicine
2013- Grant reviewer – Italian Association for Cancer Research
2013- Ad hoc reviewer – Neuroscience
2013- Ad hoc reviewer – PNAS
2013- Ad hoc reviewer – Human Molecular Genetics
2014- Grant reviewer – Alex's Lemonade Stand Foundation
2014- Scientific Advisory Board – Voices Against Brain Cancer

**Medical Licensure**:
*Massachussetts*(full) lic#231745, dates: 07/2007-present; *California* (full) lic#A85490, dates 05/27/2011-present; *Pennsylvania* (limited) lic#MT180515, dates: 06/2002-06/2003; Federal DEA#FC0864252 06/09/2008-present

**Board Certification**:
*American Board of Psychiatry and Neurology (ABPN)*, with special qualifications in Child Neurology, Part I (written) passed 1/2008, Part II (oral) passed 4/30/2009.

**C. Selected peer-reviewed publications (20 of 52 peer-reviewed papers listed)**

1. McKenna ES, Sansam CG, Cho YJ, et al. Loss of the epigenetic tumor suppressor Snf5 leads to cancer without genomic instability. ***Mol Cell Biol***. 2008 Oct;28(20):6223-33. Epub 2008 Aug 18.
2. Beroukhim R, Mermel CH, Porter D, et al. The landscape of somatic copy-number alterations across multiple human cancer types. ***Nature***. 2010 Feb 18;463(7283):899-905.
3. Wilson BG, Wang X, et al. Epigenetic antagonism between Polycomb and SWI/SNF complexes during oncogenic transformation. ***Cancer Cell***. 2010 Oct 19;18(4):316-28.
4. Cho YJ, Tsherniak A, et al. Integrative genomic analysis of medulloblasotma identifies a molecular subgroup that drives poor clinical outcome. ***J Clin Onc***. 2011 Apr 10;29(11):1424-30. Epub 2010 Nov 22.
5. Jagani Z, Mora-Blanco EL, Sansam CG, et al. Loss of the tumor suppressor Snf5 leads to aberrant activation of the Hedgehog-Gli pathway. ***Nature Medicine***. 2010 Dec;16(12):1429-33.
6. Tamayo P#, Cho YJ#, et al. Predicting relapse in medulloblasotma patients by integrating evidence from clinical and genomic features. ***J Clin Onc***. 2011 Apr 10;29(11):1415-23. Epub 2011 Feb 28.
7. Witt H, Mack SC, Ryzhova M, et al. Delineation of two clinically and molecularly distinct subgroups of posterior fossa ependymoma. ***Cancer Cell***. 2011; 20 (2): 143-57.

8. Pei Y, Moore C, et al. Dysregulation of c-MYC and p53 transforms cerebellar stem cells into large cell anaplastic medulloblastoma. ***Cancer Cell***. 2012; 21 *(2): 155-67*.
9. Wu X, Northcott PA, Dubuc A, et al. Genetic divergence of medulloblastoma due to clonal selection. ***Nature***. 2012 Feb 15;482(7386):529-33.
10. Pugh TJ, Weeraratne SD, et al**.** Medulloblasotma exome sequencing uncovers subtype-specific somatic mutations. ***Nature***. 2012 Aug 2;488(7409):106-10. 2012 Aug 2;488(7409):106-10.
11. Jones DTW, Jäger N, Kool M, et al. Dissecting the genomic complexity underlying medulloblastoma. ***Nature***. 2012 Aug 2;488(7409):100-5.
12. Northcott PA, Shih DJH, Peacock J, et al. Subgroup-specific structural variation across 1,000 medulloblasotma genomes. ***Nature***. 2012 Aug 2;488(7409):49-56.
13. Jones DTW, Hutter B, Jäger N, et al. Recurrent *FGFR1* hotspot mutations represent a novel therapeutic target in childhood astrocytoma. ***Nature Genetics***. 2013 Aug;45(8):927-32.
14. Ramkissoon LA, Horowitz PM, et al. Genomic analysis of diffuse pediatric low-grade gliomas identifies recurrent, oncogenic MYBL1-truncating rearrangements. ***PNAS***. 2013 May 14;110(20):8188-93.
15. Dykhuizen EC, Hargreaves DC, et al. mSWI/SNF (BAF) Complexes Facilitate Decatentation of DNA by Topoisomerase IIa. ***Nature***. 2013 May 30;497(7451):624-7.
16. Bender S, Tang Y, Lindroth AM, et al**.** Histone H3.3 K27M mutations in pediatric high grade gliomas lead to functional loss of PRC2 activity. ***Cancer Cell***, 2013 Nov 11;24(5):660-72.
17. Sengupta S, Weeraratne SD, et al. Chemical synthetic lethality via a5-GABAA receptor activation in *MYC*-amplified medulloblastomas. ***Acta Neurpathologica***, 2014 Apr;127(4):593-603. Epub 2013 Nov 7. *Cover article.
18. Bandopadhayay M, Bergthold G, et al. BET-bromodomain inhibition of MYC-amplified medulloblastomas. ***Clin Can Res***, 2014 Feb 15;20(4):912-25. *Cover article.
19. Kool M, Jones DTW, Jäger N, et al. Genome sequencing of SHH medulloblastoma predicts age-dependent response to smoothened-inhibition. ***Cancer Cell***, 2014 Mar 17;25(3):393-405.
20. Tang Y, Schubert S, et al. Epigenetic targeting of Hedgehog transcriptional output through BET bromodomain inhibition. ***Nature Medicine***, Epub 29 June 2014.

**Invited Presentations:**
1. Plenary session presentation, Society for Investigative Dermatology, Baltimore, MD, 05/1994, "Epidermal surface antigen cDNA is highly conserved".
**2.** Stem Cell Symposium, Children's Hospital Boston, 12/21/2007, "Developmental Pathways In Medulloblastoma Pathogenesis".
3. Neurology Grand Rounds, Oregon Health & Science University, 09/09/2009, "An Integrative Genomic Analysis of Medulloblastoma".
4. Plenary session, 14th International Symposium on Pediatric Neuro-oncology, Vienna, Austria, 06/21/2010, "Integrative genomic analysis of medulloblastoma identifies a molecular subgroup that drives poor clinical outcome".
5. Neurology Grand Rounds, Harvard Medical School, 9/1/2010, "Risk-stratification and targeted therapy development in medulloblastoma using an integrative genomics approach".
6. Children's Oncology Group, CNS committee, Medulloblastoma breakout session, Dallas, TX, 9/23/2010, "Integrative genomic analysis identifies molecular subtype that drive poor clinical outcome in medulloblastoma".
7. Molecular Radiation Sciences Seminar Series, Department of Radiation Oncology, Johns Hopkins Medical Center, 10/27/2010, "Medulloblastoma risk stratification using an integrative genomics approach".
8. Division of Hematology/Oncology Seminar Series, Children's Hospital Boston/Dana-Farber Cancer Institute, 2/17/2010, "Molecular classification and risk-stratification in medulloblastoma using an integrative genomics approach".
9. Sanford-Burnham Institute, San Diego, CA, 03/03/2011, "Molecular classification and risk-stratification in medulloblastoma using an integrative genomics approach".
10. Minisymposium presentation, Amer Assoc for Cancer Research, Orlando, FL, 04/05/2011, "Molecular classification and risk-stratification in medulloblastoma using an integrative genomics approach".
11. Multidisciplinary Neuro-Oncology Conference, Dana-Farber/Brigham and Women's Hospital, 4/15/2011, "Molecular classification and risk-stratification in medulloblastoma".
12. Society for Neuro-oncology, Pediatric Neuro-oncology Basic and Translational Research meeting, New Orleans, 5/19-20/2011, "Next-generation high throughput sequencing reveals an FBXW7 mutation in a SHH pathway medulloblastoma".
13. Society for Neuro-oncology, Pediatric Neuro-oncology Basic and Translational Research meeting, New Orleans, 5/19-20/2011, "The miR-183~96~182 cluster inhibits cellular senescence and promotes survival in 'high-risk' medulloblastoma".
14. Neurology Grand Rounds, Stanford University School of Medicine, 12/2/2011, "Top-down and bottom-up approaches to understanding and treating medulloblastoma".
15. Invited speaker, Helen Diller Family Comprehensive Cancer Center "Pediatric Malignancies" Symposium, UCSF, 4/26/2012, "Top-down and bottom-up approaches to understanding and treating medulloblastoma".
16. 19th International Brain Tumor Research and Therapy Conference, Niagara Falls, Canada, 6/24/2012, "Leveraging a5/GABA-A receptor expression in medulloblastoma as a novel therapeutic approach".
17. Plenary session, 15th International Symposium on Pediatric Neuro-oncology, Toronto, Canada, 06/24/2010, "Medulloblastoma exome sequencing uncovers subtype-specific mutations within a broad landscape of genetic heterogeneity".
18. Breakfast Symposium, 15th International Symposium on Pediatric Neuro-oncology, Toronto, Canada, 06/25/2010, "Patient selection strategies in the treatment of medulloblastoma".
19. Neurosurgery Grand Rounds, Stanford University School of Medicine, 08/25/2012, "Medulloblastomics".
20. Pediatrics Grand Rounds, Lucile Packard Children's Hospital/Stanford University School of Medicine, 09/28/2012, "Medulloblastoma: From bedside to bench and back again".
21. The Global Symposium on Childhood Brain Tumors, Bunker Bay, Western Australia, 02/13/2013, "Lead generation and characterization in MYC-driven medulloblastoma".
22. Research Seminar and parent/public forum, Telethon Institute for Child Health Research, Perth, Australia, 02/14/2013, "Medulloblastoma: From bedside to bench and back".

23. Division of Pediatric Hematology-Oncology, Research Seminar Series, Texas Children's Hospital, Houston, TX, 02/28/2013, "Medulloblastoma: A journey from bedside to bench and back".
24. Brain Tumor Seminar Series, Memorial Sloan-Kettering Cancer Center, New York, NY, 9/22/2013, "Identifying and targeting genetic and epigenetic vulnerabilities in medulloblastoma".
25. Department of Pathology, University Medical Center, Utrecht, NL, 12/4/2013, "Identifying and targeting genetic, epigenetic and metabolic vulnerabilities in medulloblastoma".
26. Grand Rounds, St. Jude Cancer Research Hospital, Memphis, TN, 12/17/2013, "Identifying and targeting genetic, epigenetic and metabolic vulnerabilities in medulloblastoma".
27. Medulloblastoma in the Mountains, St. Moritz, Switzerland, 1/13-16/2014, "Genome-wide shRNA screenin of 'high-risk' medulloblastoma".
28. NCI/NIH sponsored workshop: Applying Chromatin Biology to Understand Diffuse Intrinsic Pontine Glioma, 2/18-19/2014, "H3K27me3, DNA methylation and gene expression in K27M mutant gliomas".
29. Brain Tumor session, SIOP Asia Congress, Seoul, Korea, 4/19/2014, "Identifying and targeting 'high-risk' medulloblastoma".
30. Education session, 2014 ASCO Annual meeting, 06/01/2014, "Impact of Genetic and Molecular Discoveries on Frontline Trials for Treatment of CNS Tumors"
31. Department of Pediatrics Research Seminar series, Oregon Health & Sciences University, Portland, OR, 7/15/2014, "Transcripitonal and translational control in medulloblastoma".

**D. Research Support**

**Active**

Scholar Award (Cho) 09/01/2011-08/31/2014 2.4 cal
St. Baldrick's Foundation $330,000
Title: Functional annotation of the medulloblastoma genome
The goal of this project is to perform genome-wide shRNA-mediated knockdown in *MYC*-amplified medulloblastoma cells to identify genetic factors that these tumors depend on for growth and survival.
Role: PI

Large-Scale Applied Research Project (Taylor, Malkin) 07/01/2011-06/30/2014 0.6 cal
Genome Canada $9,856,814
Title: Stratifying and Targeting Pediatric Medulloblastoma Through Genomics
The goal of this multi-institutional collaboration is to perform RNAseq on a large cohort of medulloblastoma samples (estimated 2000) to better define subgroups within this disease, molecular markers predictive of prognosis and genetic lesions or pathways amenable to more effective therapeutic strategies.
Role: Co-Investigator

Research Scholar Grant (Tran) 7/01/2012-06/30/2016 1.2 cal
American Cancer Society $142,937
Title: Twist1 structure-function studies of Kras-induced senescence inhibition
The goal of this project is to identify through human and mouse models of Kras-induced lung carcinogenesis, the structural domains of Twist1 that inhibit Kras-induced senescence and the global differences in Twist1 occupancy of genomic loci that occur between senescent and tumorigenic states. My specific role on this project is to provide bioinformatics support for Twist1 ChIP-seq/ChIP-chip studies.
Role: co-Investigator

Phil R. Dodge Young Investigator Award (Cho) 10/1/2012-9/30/2014 .024 cal
Child Neurology Society $20,000
Title: Genetic and pharmacological manipulation of the medulloblastoma genome
The goal of this project is to perform and then merge RNAi, chemical biology and chemical genomic screening to identify cross-platform consensus of putative therapeutic targets in medulloblastoma.
Role: PI

1U01CA176287-01 (Weiss, Balmain, Cho) 05/01/2013-03/31/2015 1.2 cal
NCI/Cancer Target Discovery and Development Network $250,000
Title: Genetic network analysis of cancer targets
The goal of this project is to integrate genomic screening of human medulloblastoma tumors with mouse coexpression networks to identify both new medulloblastoma targets, and novel roles for pathways with existing therapeutics. This project is intended to provide collaboration and resource sharing through the Cancer Target Discovery and Development network at NCI.
Role: co-PI

SUMS seed grant 01/15/2014-08/15/2014
Stanford University Mass Spectrometry $15,000
Title: Characterizing intermolecular interactions and post-translational modifications of mutant DDX3
My group recently identified DDX3X as one of the most commonly mutated genes in medulloblastoma. This seed funding explores how mutations in DDX3X, an RNA helicase with pleitropic roles in RNA metabolism, affect its interaction with other proteins and whether it uncouples helicase activity from N-terminal-related signal transduction functions. Understanding these alterations induced by mutation will help clarify its contribution to the oncogenic process.

**PENDING**: None.
**OVERLAP:** There are no overlaps between the Aims of the projects listed above and those proposed in this application.