# **CURRICULUM VITAE**

Date of Revision:	June 8, 2020
Name:	Manoj M. Pillai, M.D.
Current Position(s):	Associate Professor of Medicine, Department of Internal Medicine, Section of Hematology, Clinician Scholar Track Associate Professor of Pathology
Term: School:	July 1, 2016 – June 30, 2021 Yale University School of Medicine

#### **Education:**

MBBS All India Institute of Medical Sciences, (Bachelor of Medicine, Bachelor of Surgery), New Delhi, India

### **Career/Academic Appointments:**

1999-00	Intern, Internal Medicine, Baylor College of Medicine, Houston, TX
2000-02	Resident, Internal Medicine, Baylor college of Medicine, Houston, TX
2002-05	Postdoctoral Fellow in Medical Oncology, Fred Hutchinson Cancer Research Center &
	University of Washington, Seattle, WA
2003-05	Postdoctoral Fellow, (laboratory of Dr. Beverly Torok-Storb), Fred Hutchinson Cancer
	Research Center, Seattle, WA
2005-08	Acting Instructor, University of Washington, Seattle, WA
2005-08	Research Associate, Fred Hutchinson Cancer Research Center, Seattle, WA
2005-08	Attending Physician, University of Washington Medical Center, Seattle, WA
2005-08	Staff Physician, Seattle Cancer Care Alliance, Seattle, WA
2008-13	Assistant Professor of Medicine (tenure track), Division of Medical Oncology,
	Department of Medicine, University of Colorado Denver School of Medicine, Denver, CO
2008-13	Attending Physician, University of Colorado Hospital, Aurora, CO
2013-2016	Assistant Professor, Yale University School of Medicine, Section of Hematology, New
	Haven, CT
2013-present	Attending Physician, Yale New Haven Hospital, New Haven, CT
2016-present	Associate Professor of Medicine and Pathology, Yale University School of Medicine,
	New Haven, CT

### **Administrative Positions:**

- 2014-present Director of Hematology, Physician Scientist selection committee, Internal Medicine Residency Program
- 2015-present Associate Director, Genomics and Transcriptomics Core, Yale Center for Excellence in Hematology

# **Board Certification:**

Diplomat of American Board of Internal Medicine, 2002 Diplomat of American Board of Internal Medicine in Medical Oncology, 2005 (Recertified 2015)

# **Professional Honors & Recognition:**

### International/National/Regional

2005-2006:	Cancer Research Fellow of the Ladies Auxiliary to the Veterans of Foreign Wars of the
	United States
2003-2005:	NIH/NCI Training Grant, Fred Hutchinson Cancer Research Center, University of
	Washington
2004:	Travel Grant, American Society of Hematology
1994:	Sir Dorabji Tata Prize for Best Undergraduate in Biochemistry
1992:	8th position nationwide in All India Central Board of Secondary Education's Pre-Medical
	Examination
1990-1998:	National Talent Search Exam (NTSE) Scholar, National Council for Education Research
	and Training (NCERT), India

# **Grants History:**

### **Current Grants:**

Agency: NIH/NHLBI ID#: R01HL133406 Title: "Deregulation of SF3B1 function by recurrent HEAT domain mutations" PI: Pillai, Manoj M MD & Neugebauer, KN Role: Principal Investigator (Corresponding) Percent Effort: 25% Direct Costs/per year: \$250,000 Status: Project Period: 08/01/2017-05/31/2021

Agency: NIH/NIGMS ID#: R01 GM123336-01 Title: "Robust rational design of chemical tools to inhibit RNA-binding proteins" PI: Karanicolas, John Role: Co-Investigator Percent Effort: 5% Direct Costs/per year: \$221,370 (Yale subcontract \$31,064/ year) Status: Project Period: 08/01/2017-05/31/2021

Agency: Regenerative Medicine Research Fund (Connecticut State) ID#: N/A Title: Biology and therapeutic targeting of splicing factor mutant MDS PI: Halene, Stephanie and Pillai, Manoj M Role: Co-Principal Investigator Percent Effort: 10% Direct Costs/per year: \$180,000 Total costs for project period: \$749,997 Project period: 10/1/16-9/30/19 Agency: DeLuca Center for Translational Hematology ID#: Pilot Grant 2019 Title: Epigenetic alterations in splicing factor-mutant MDS PI: Pillai, Manoj M Role: Principal Investigator Percent Effort: 0% Direct Costs/per year: \$50,000 Total costs for project period: \$50,000 Project period: 9/1/19-8/31/20

Agency:NIH/NIDDKID#:U54DK106857Title:"Yale Cooperative Hematology Specialized Core Center"P.I.:Krause, Diane M.D. PhDRole:Co-InvestigatorPercent effort:5%Direct costs per year:\$600,000Total costs for project period:\$1,000,000Project period:08/01/2015 - 07/31/2020

Agency:YCCEH (Yale Core Center for Excellence in Hematology)ID#:N/ATitle:"Defining Enhancer Elements in the Hematopoietic Niche"P.I.:Pillai, Manoj M. MDRole:Principal InvestigatorPercent effort:0%Total costs for project period:\$30,000Project period:04/01/2016 - 09/30/2018 (NCE)

### **Pending Grants:**

Agency: NIH/NHLBI ID#: R21HL150642 Title: "Analysis of transcription and splicing coordination during erythropoiesis using single molecule RNA-seq" PI: Pillai, Manoj M MD & Neugebauer, KN Role: MPI Percent Effort: 5% Direct Costs/per year: \$125,000 Status: Pending, 26<sup>th</sup> percentile Project Period: 012/01/2019-11/30/2021

# **Past Grants**

Agency: NIH/NCI ID#: 1R03CA219719-01 Title: "Determining branch point choice in SF3B1 mutant cancers" PI: Pillai, Manoj M MD Role: Principal Investigator Percent Effort: 10% Direct Costs/per year: \$50,000 Project Period: Declined due to overlap with R01 HL133406

Agency:NIH/NHLBII.D#:R01HL104070Title:"Role of microRNAs in regulation of the marrow microenvironment"P.I.:Pillai, Manoj M. MDRole:Principal InvestigatorPercent effort:33%Direct costs per year:\$250,000Total costs for project period:\$1,803,850Project period:04/08/2011-01/31/2017 (No cost extension from 1/31/2016)

 Agency:
 NIH/NHLBI

 ID#:
 R01HL104070-S1

 Title:
 "Administrative Supplement to train post-doctoral fellows from under-represented minorities"

 P.I.:
 Pillai, Manoj M. MD

 Role:
 Principal Investigator

 Percent effort:
 0% (concurrent with R01HL104070).

 Direct costs per year:
 \$50,000

 Total costs for project period:
 \$311,060

Project period: 10/01/2012-01/31/2016

Agency:Yale Cancer CenterID#:Co-PI PilotTitle:"Common Mechanisms of Oncogenesis Conferred by Splicing Factor Mutations in<br/>Cancer"P.I.:Pillai, Halene and NeugebauerRole: Principal InvestigatorPercent effort:0%Total costs for project period:\$100,000Project period:04/01/2015 - 09/31/2016 (No cost extension from 04/01/2016)

Agency:Cancer League of ColoradoID#:N/ATitle:SF3B1 mutations in Myelodysplastic Syndrome (MDS)PI:Manoj Pillai M.D and Jay R Hesselberth PhDPercent effort:0%Direct costs per year:50,000Total costs for project period:50,000Project period:7/01/2013-06/30/2014

Agency:NIH/NIDDKID#:R03DK082757Title:"Role of macrophages in MSC-mediated recovery of hematopoiesis after irradiation"P.I.:Manoj Pillai, M.D.Percent effort:75%Total costs for project period:136,590

Project period: 09/2009-06/2012

Agency:NIH/NIDDKID#:K08DK073701Title:"Monocyte derived CXCL7 in the marrow microenvironment"P.I.:Manoj Pillai, M.D.Percent effort:75%Total costs for project period:640,990Project period:03/2006-02/2012

Agency:Cancer Research Fellowship, Ladies Auxiliary to the Veterans of Foreign WarsTitle:"Monocyte/ Macrophages in Myelodysplastic Syndrome (MDS)"P.I.Manoj Pillai, M.D.Percent effort:75%Total costs for project period:\$50,000Project period:07/2005-02/2006

### **Pending Grants:**

Agency: NIH/NHLBI ID#: R21HL150642 Title: "Analysis of transcription and splicing coordination during erythropoeisis using single molecule RNA-seq" PI: Pillai, Manoj M. & Neugebauer, KN Role: MPI Percent Effort: 5% Direct Costs/per year: \$125,000 Status: Pending, 26th percentile Project Period: 012/01/2019-11/30/2021

### Invited Speaking Engagements, Presentations, Symposia & Workshops Not Affiliated with Yale:

#### International/National

- 2019: Organizer, 3<sup>rd</sup> international Symposium on RNA Biology and Splicing
- 2019: Grand rounds, University of Alabama Cancer Center, Birmingham, Alabama
- 2019: Invited Speaker, Transplant and Cellular Therapy Section, University of Miami, Miami, FL
- 2018 Splicing workshop, Evans MDS Foundation, New Haven, CT
- 2017: Grand Rounds, Cancer Center, Indiana University, Indianapolis, IN
- 2017: Invited Speaker, Research Seminars, Fox Chase Cancer Center, Philadelphia, PA
- 2016: Invited Speaker, Focus on Technology Seminar Series, Blood Research Institute of Wisconsin, Milwaukee, WI
- 2016: Member, Abstract review committee, American Society of Hematology (ASH)
- 2015: Chair, Oral abstracts on Disease Progression at the 13<sup>th</sup> International Symposium on Myelodysplastic Syndromes, Washington D.C.
- 2012: Research and Innovation Meeting, University of Colorado, Denver, CO: "Use of Genomewide biochemistry to study hematopoiesis"
- 2011: Hematology Grand Rounds, Division of Hematology, University of Washington, Seattle, WA: "Role of microRNAs in the regulation of hematopoietic microenvironment"

- 2011: Internal Medicine Grand Rounds, University of Colorado, Denver, CO: "Regulation of hematopoiesis in normal and disease states"
- 2011: Micro-RNA Workshop, Institute of Stem Cells and Regenerative Medicine, University of Washington, Seattle, WA: "MicroRNAS in Hematopoiesis"
- 2010: Small Nucleic Acid Workshop and Symposium, Fred Hutchinson Cancer Research Center, Seattle, WA: "Small RNAs in hematopoiesis: genome-wide approaches"
- 2008: Grand Rounds, Division of Hematology-Oncology University of Texas Southwestern School of Medicine, Dallas, TX: "Monocyte/ macrophages in hematopoietic regulation"
- 2008: Grand Rounds, Division of Bone Marrow Transplantation, MD Anderson Cancer Center, Houston, TX: "Regulation of Hematopoiesis: role of macrophages"
- 2008: Grand Rounds, Division of Hematology and Oncology, Indiana University School of Medicine, Indianapolis, IN: "Inducible transgenic model to define hematopoietic regulation by monocytes/ macrophages"
- 2006: Clinical Research Division Presentation, Fred Hutchinson Cancer Research Center, Seattle, WA: "CXCL7 in hematopoietic regulation"
- 2006: International Stem Cell Therapy (ISCT) workshop, Berlin, Germany: "Role of Microenvironment in Hematopoiesis: Mobilization and Engraftment"

# Peer-Reviewed Presentations & Symposia Given at Meetings Not Affiliated with Yale:

# International/National

- 2017: Blood (American Society of Hematology Annual Meeting), Atlanta, GA, "PD-1H (VISTA) Induces Immune Evasion in Acute Myeloid Leukemia"
- 2016: Blood (American Society of Hematology Annual Meeting), San Diego, CA, "Integrative Analysis of RNA-Interactome and Translatome Reveal Functional Targets of MSI2 in Myeloid Leukemia."
- 2106: Blood (American Society of Hematology Annual Meeting), San Diego, CA, "SF3B1 Interactions with Chromatin Are Dynamic and Regulated in a Cell Cycle-Dependent Manner."
- 2015: 20th Annual Meeting of the RNA Society Madison, WI, "Mutant SF3B1 results in altered expression of key genes related to Myelodysplastic Syndromes (MDS)"
- 2013: Blood (American Society of Hematology Annual Meeting), New Orleans, LA, "Expression of Mutant Spliceosomal Protein SF3B1 Results In Dysregulated Hematopoietic Maturation
- 2012: San Antonio Breast Cancer symposium, San Antonio, TX, "High throughput sequencing following cross-linked immune-precipitation (HITS-CLIP) of Argonaute protein reveals novel miRNA regulatory pathways of Estrogen Receptor in breast cancer."
- 2011: Blood (American Society of Hematology Annual Meeting), San Diego, CA "High throughput sequencing following cross-linked immune precipitation (HITS-CLIP) of Argonaute (AGO) identifies Mir-9 as a regulator of MMP2 in the marrow microenvironment (ME)."
- 2011: Blood (American Society of Hematology Annual Meeting), San Diego, CA "Marrow stromal cells (MSC) rescue hematopoiesis in lethally irradiated mice despite rapid clearance after infusion."
- 2010: Blood (American Society of Hematology Annual Meeting), Orlando, FL "High throughput sequencing following cross-linked immune precipitation (HITS-CLIP) of Argonaute (AGO) identifies Mir-193a as a regulator of jagged1 in Marrow Stromal Cells."
- 2009: Blood (American Society of Hematology Annual Meeting), New Orleans, LA, "Mir-886-3p Contributes to the Regulation of the hematopoietic microenvironment by down-Regulating SDF-1α (CXCL12)."

- 2005: Blood (American Society of Hematology Annual Meeting), San Diego, CA, "Inducible Levels of Gelatinase B/Matrix Metalloproteinase-9 Gene Expression in Monocytes Are Associated with Marrow Cellularity in Myelodysplastic Syndrome (MDS)."
- 2004: Blood (American Society of Hematology Annual Meeting), San Diego, CA, "Human Marrow Stromal Cells Activate Monocytes to Secrete CXCL7 Peptides, Which Alter the Composition of the Hematopoietic Microenvironment (ME)."

### **Professional Service**

### Peer Review Groups/Grant Study Sections:

#### **NIH Study Section**

2017	Molecular Oncogenesis (MONC), Temporary member
2018	SEP, Provocative Questions in Cancer, NCI/NIH
2018	Molecular and Cellular Hematology (MCH), Temporary Member
2018	SEP ZRG (Vascular and Hematology member conflict)
2019	Molecular and Cellular Hematology (MCH), Temporary Member
2019	SEP ZRG (Vascular and Hematology member conflict)
2020	SEP, R21/R03 NCI/NIH

### Foundations

2019

Worldwide Cancer Research Foundation, Edinburgh, UK

#### Journal Service:

Reviewer (ad hoc)	
2019-present	Blood
2018-present	iScience (from Cell)
2016-present	PLOS Genetics
2015-present	BMC Genomics
2014-present	Leukemia
2014-present	Stem Cells
2013-present	Leukemia and Lymphoma
2008-present	Cancer Research
2008-present	British Journal of Hematology
2005-present	PLOS One
2005-present	Transgenic Research
2005-present	Molecular Carcinogenesis

### **Professional Service for Professional Organizations:**

2004-present	Member, American Society of Hematology
2015-present	Member, Myelodysplastic Syndrome Foundation
2019-present	Member, American Association for Cancer Research

### Yale University Service:

#### University:

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2016	Manalaan	VCCEIL	ailat anaut		a a vera vera itta a
2010-present	Member.	ICCERI	phot gran	review	committee
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2016-present	Member, Yale Cancer Center Translational Working Group subcommittee on living tumor registry
2018-present	Member, Protocol Review Committee (PRC)
2017-present	Member, YCC faculty compensation committee
2017-present	Member, YCC committee on Physician Scientists
2019-present	Member, Yale School of Medicine BBS Graduate Program
2019-present	Member, Yale Cancer Center Physician Scientist Training Program NCI T32)
2020	Member, Translational-Targeted Area of Research Excellence (T-TARE) Review Committee
2020	Member, YCCI Scholar Selection Committee
2020	Member, Pew Stewart Scholars Selection Committee.

# **Department:**

2013-present:	Member, Hematology-Oncology Fellowship committee
2014-present:	Section representative, Physician-Scientist Training Program
2019-present	Member, Grand Rounds Committee
2019-present	Member, Translational-Targeted Area of Research Excellence Awards (YCC)

# Section of Hematology:

2014-2018	Organizer, Hematology Research Seminar Series
2015-present	Organizing Committee, Annual Hematology Retreat.
2019-present	Member, Hematology working group

# **Bibliography:**

# **Peer-Reviewed Original Research**

- Chen, J., Dong, J.F., Sun, C., Bergeron, A., McBride, L., Pillai M, Barnard, M.R., Salmon, J., Michelson, A.D., Bray, P.F. Platelet FcgammaRIIA His131Arg polymorphism and platelet function: Antibodies to platelet-bound fibrinogen induce platelet activation. J Thromb Haemost. 2003 Feb; 1(2):355-62.
- 2. Pillai, MM, Torok-Storb, B., Iwata, M. Expression and function of IL-7 receptors in marrow stromal cells. Leuk Lymphoma. 2004 Dec.; 45(12):2403-8.
- 3. Pillai, MM, Iwata, M., Awaya, N., Graf, L., Torok-Storb, B. Monocyte-derived CXCL7 peptides in the marrow microenvironment. Blood. 2006 May 1; 107(9):3520-6. PMCID: PMC1895768.
- 4. Iwata, M., Pillai MM, Ramakrishnan, A., Hackman, R.C., Deeg, H.J., Opdenakker, G., Torok-Storb, B. Reduced expression of inducible gelatinase B/matrix metalloproteinase-9 in monocytes from patients with myelodysplastic syndrome: Correlation of inducible levels with the percentage of cytogenetically marked cells and with marrow cellularity. Blood. 2007 Jan 1; 109(1):85-92. PMCID: PMC1785081.
- Pillai MM\*, Venkataraman, G.M., Kosak, S., Torok-Storb, B. Integration site analysis in transgenic mice by thermal asymmetric interlaced (TAIL)-PCR: Segregating multiple-integrant founder lines and determining zygosity. Transgenic Res. 2008 Aug; 17(4):749-54. (Corresponding author)
- 6. **Pillai MM\***, Hayes, B., Torok-Storb, B. Inducible transgenes under the control of the hCD68 promoter identifies mouse macrophages with a distribution that differs from the F4/80 and

CSF-1R expressing populations. Exp Hematol. 2009 Dec; 37(12):1387-92. PMC Journal in process. (Corresponding author)

- Pillai MM\*, Yang, X., Balakrishnan, B., Bemis, L. and Torok-Storb, B. Mir-886-3p downregulates CXCL12 (SDF1) expression in human marrow stromal cells. PLOS One Dec 13, 2010 5(12): e14304. PMCID: PMC3001477 (Corresponding author)
- 8. Yang, X., Balakrishnan, I., Torok-Storb, B. and **Pillai, M.M\***. Marrow Stromal Cell (MSC) infusion rescues hematopoiesis in lethally irradiated mice despite rapid clearance after infusion Advances in Hematology. 2012; 2012:142530. Epub 2012 Feb 16. (Corresponding author)
- Balakrishnan, I., Yang X., Brown, J., Ramakrishnan, A., Kabos, J., Hesselberth, J.A., and Pillai MM\*. Genome-wide analysis of miRNA-mRNA interactions in marrow stromal cells. Stem Cells. 2013 Aug 23. doi: 10.1002/stem.1531. [Epub ahead of print] (Corresponding author
- Ramakrishnan, A., Torok-Storb, B. and Pillai MM\*. Primary Marrow Derived Stromal Cells: Isolation and Manipulation. (Methods Mol Biol). 2013; 1035:75-101. doi: 10.1007/978-1-62703-508-8\_8. (Corresponding Author)
- Pillai MM, Gillen AE, Yamamoto TM, Kline E, Brown J, Flory K, Hesselberth JR, Kabos P. HITS-CLIP reveals key regulators of nuclear receptor signaling in breast cancer. Breast Cancer Res Treat. 2014 Jul; 146(1):85-97. doi: 10.1007/s10549-014-3004-9. Epub 2014 Jun 7. PubMed PMID: 24906430; PubMed Central PMCID: PMC4115274.
- Kesarwani A.K., Ramirez O, Yang X, Gupta AK, Murthy T, Minella AC and Pillai MM\*. Cancer associated SF3B1 mutants recognize otherwise inaccessible cryptic 3' splice sites within RNA secondary structures. Oncogene. 2016 Aug 15. doi:10.1038/onc.2016.279. (Corresponding Author)
- Brechbuhl HM, Finlay-Schultz J, Yamamoto TM, Gillen AE, Cittelly DM, Tan AC,Sams SB, Pillai MM, Elias AD, Robinson WA, Sartorius CA, Kabos P. Fibroblast Subtypes Regulate Responsiveness of Luminal Breast Cancer to Estrogen. Clin Cancer Res. 2017 Apr 1;23(7):1710-1721. doi: 10.1158/1078-0432.CCR-15-2851. Epub 2016 Oct 4. PubMed PMID: 27702820; PubMed Central PMCID: PMC5378660.
- Swartz KL, Wood SN, Murthy T, Ramirez O, Qin G, Pillai MM, Rao S, Minella AC. E2F-2 Promotes Nuclear Condensation and Enucleation of Terminally Differentiated Erythroblasts. Mol Cell Biol. 2016 Dec 19;37(1). pii: e00274-16. Print 2017 Jan 1. PubMed PMID: 27795297; PubMed Central PMCID: PMC5192079.
- Gillen AE, Brechbuhl HM, Yamamoto TM, Kline E, Pillai MM, Hesselberth JR, Kabos P. Alternative Polyadenylation of PRELID1 Regulates Mitochondrial ROS Signaling and Cancer Outcomes. Mol Cancer Res. 2017 Dec;15(12):1741-1751. doi: 10.1158/1541-7786.MCR-17-0010. Epub 2017 Sep 14. PubMed PMID: 28912168; PubMed Central PMCID: PMC5791535.
- Murthy T, Bluemn T, Gupta AK, Reimer M Jr, Rao S, Pillai MM\*, Minella AC. Cyclindependent kinase 1 (CDK1) and CDK2 have opposing roles in regulating interactions of splicing factor 3B1 with chromatin. J Biol Chem. 2018 Jun 29;293(26):10220-10234. doi: 10.1074/jbc.RA118.001654. PubMed PMID: 29764937; PubMed Central PMCID: PMC6028971. (Corresponding Author)
- 17. Gupta AK, Murthy T, Paul KV, Ramirez O, Fisher JB, Rao S, Rosenberg AB, Seelig G, Minella AC and **Pillai MM**. Degenerate minigene library analysis enables identification of

altered branch point choice by mutant splicing factor 3B1 (SF3B1). Nucleic Acids Res. 2018 Nov 20. doi: 10.1093/nar/gky1161. (Corresponding author)

- The development and use of scalable systems for studying aberrant splicing in SF3B1-mutant CLL: Murthy T, Paul KV, Minella AC and Pillai MM\*. Methods Mol Biol. 2019;1881:83-99. doi: 10.1007/978-1-4939-8876-1\_7 (Corresponding author)
- 19. Ki JS, He X, Liu J, Duan Z, Kim T, Gerard J, Kim B, Pillai MM, Lane WS, Noble WS, Budnik B and Waldman T. Systematic proteomics of endogenous human cohesin reveals an interaction with diverse splicing factors and RNA binding proteins required for mitotic progression. J Biol Chem. 2019 May 31;294(22):8760-8772. doi: 10.1074/jbc.RA119.007832. Epub 2019 Apr 22
- 20. Ramirez O, Gupta AK, Paul KV, Botti V, Meyer AE Igor RLM, Neuenkirchen N, Ross RJ, Minella AC, Neugebauer KM and **Pillai MM**. Identification of functional translational targets of Musashi 2 (MSI2) in myeloid leukemia. In revision (Corresponding author)
- Bewersdorf JP, Shallis RM, Gowda L, Wei W, Hager K, Isufi I, Kim TK, Pillai MM, Seropian S, Podoltsev NA, Gore SD, Siddon AJ, Zeidan AM. Clinical outcomes and characteristics of patients with *TP53*-mutated acute myeloid leukemia or myelodysplastic syndromes: a single center experience. Leuk Lymphoma. 2020 May 2;:1-11. doi: 10.1080/10428194.2020.1759051. [Epub ahead of print] PubMed PMID: 32362171.
- 22. Kim JS, He X, Liu J, Duan Z, Kim T, Gerard J, Kim B, Pillai MM, Lane WS, Noble WS, Budnik B, Waldman T. Systematic proteomics of endogenous human cohesin reveals an interaction with diverse splicing factors and RNA-binding proteins required for mitotic progression. J Biol Chem. 2019 May 31;294(22):8760-8772. doi: 10.1074/jbc.RA119.007832. Epub 2019 Apr 22. PubMed PMID: 31010829; PubMed Central PMCID: PMC6552432.

#### Chapters, Books, and Reviews

1. Hematopoietic Stem Cell Niche: Ramakrishnan A, **Pillai, M.M.** and Torok-Storb, B. (in Adult Stem Cells, Stem Cell Biology and Regenerative Medicine, <u>Springer Books 2014</u>).

**Current Clinical Trials** Agency: Yale University ID#: 2000023417 Title: Phase III Randomized Study of Crenolanib versus Midostaurin Administered Following Induction Chemotherapy and Consolidation Therapy in Newly Diagnosed Subjects with FLT3 Mutated Acute Myeloid Leukemia P.I.: Nikolai Podoltsev, M.D. PhD Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: On Hold Agency: Yale University ID#: 2000023160 Title: A Phase 1/1b Dose Escalation, Multicenter, Open-label, Safety, Pharmacokinetic and Pharmacodynamic Study of FT-1101 as a Single Agent and in Combination with Azacitidine in Patients with Relapsed or Refractory Hematologic Malignancies P.I.: Thomas Prebet, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: New Agency: Yale University ID#: 2000023150 Title: A Phase Ib Study of Ruxolitinib in Combination with PUH71 for the treatment of Subjects with Primary Myelofibrosis (PMF), Post-Polycythemia Vera MF (post-PV MF), and Post-Essential Thrombocythemia MF (post-ET MF) P.I.: Nikolai Podoltsev, M.D. PhD Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: New Agency: Yale University ID#: 2000022261 Title: Phase I, international, multicentre, open-label, non-randomised, non-comparative study of intravenously administered S64315, a Mcl-1 inhibitor, in patients with Acute Myeloid Leukaemia (AML) or Myelodysplastic Syndrome (MDS) P.I.: Thomas Prebet, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A

Project period:

Status: Open to Accrual

Agency: Yale University ID#: 2000022212 Title: A Phase 1 Dose-Escalation Study of LAM-003 in Patients with Acute Myeloid Leukemia P.I.: Nikolai Podoltsev, M.D. PhD Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual

Agency: Yale University ID#: 2000022156 Title: A Multi-center, Randomized, Double-blind, Placebo-controlled Phase III Trial of the FLT3 Inhibitor Gilteritinib Administered as Maintenance Therapy Following Allogeneic Transplant for Patients with FLT3/ITD AML P.I.: Stuart Seropian, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: IRB Initial Approval

Agency: Yale University ID#: 2000022061 Title: A Phase I/II, Multicenter, Open-label, Dose Escalation and Randomized Trial of BI 836858 in Patients with Low or Intermediate-1 Risk Myelodysplastic Syndromes P.I.: Amer Zeidan, MBBS Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: IRB Initial Approval

Agency: Yale University ID#: 2000022055 Title: NCI 10030, A phase 1 study of blinatumomab in combination with checkpoint inhibitor(s) of PD-1 (nivolumab) or both PD-1 (nivolumab) and CTLA-4 (ipilimumab) in patients with poor-risk, relapsed or refractory CD19+ precursor B-lymphoblastic leukemia (CIRB) P.I.: Amer Zeidan, MBBS Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: IRB Initial Approval

Agency: Yale University ID#: 2000021932 Title: A Phase 1b/2 Study of PCM-075 in Combination with either Low-Dose Cytarabine or Decitabine in Subjects with Acute Myeloid Leukemia (AML) P.I.: Amer Zeidan, MBBS Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual

Agency: Yale University ID#: 2000021825 Title: An Open-Label, Phase I, Dose-Escalation Study Evaluating the Safety and Tolerability of DCLL9718S in Patients with Relapsed or Refractory Acute Myeloid Leukemia (AML) or DCLL9718S in Combination with Azacitidine in Patients with Previously Untreated AML Unsuitable for Intensive Induction Chemotherapy P.I.: Nikolai Podoltsev, M.D. PhD Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual

Agency: Yale University ID#: 2000021578 Title: A phase III randomized open-label multi-center study of ruxolitinib vs. best available therapy in patients with corticosteroid-refractory chronic graft vs host disease after allogeneic stem cell transplantation (REACH 3) (WIRB) P.I.: Stuart Seropian, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: IRB Initial Approval

Agency: Yale University ID#: 2000021484 Title: An Open-Label, Randomized, Phase 2 Dose-Finding Study of Pacritinib in Patients with Primary Myelofibrosis, Post-Polycythemia Vera Myelofibrosis, or Post-Essential Thrombocythemia Myelofibrosis Previously Treated with Ruxolitinib (WIRB) P.I.: Nikolai Podoltsev, M.D. PhD Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual

Agency: Yale University ID#: 2000021212 Title: A Phase 1b Study Evaluating the Safety and Pharmacokinetics of Venetoclax as Single Agent and in Combination with Azacitidine in Subjects with Higher-Risk Myelodysplastic Syndromes after Hypomethylating Agent Failure P.I.: Amer Zeidan, MBBS Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: IRB Initial Approval

Agency: Yale University ID#: 2000021179 Title: Dronabinol for Pain and Inflammation in Adults Living with Sickle Cell Disease P.I.: Susanna Curtis, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: New

Agency: Yale University ID#: 2000021051 Title: A Phase 1 Clinical Study of DSP-7888 Dosing Emulsion in Adult Patients with Advanced Malignancies P.I.: Thomas Prebet, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: IRB Initial Approval

Agency: Yale University ID#: 2000020860 Title: 10009, A Phase 1b study of the anti-PD1 antibody Pembrolizumab in combination with the histone deacetylase inhibitor, Entinostat for treatment of patients with myelodysplastic syndromes after DNA methyltransferase inhibitor therapy failure (CIRB) P.I.: Amer Zeidan, MBBS Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual

Agency: Yale University ID#: 2000020835 Title: A Phase 1, Open-label, Dose-Finding Study of CC-90009, a Novel Cereblon E3 Ligase Modulating Drug, in Subjects with Relapsed or Refractory Acute Myeloid Leukemia P.I.: Amer Zeiden Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual

Agency: Yale University ID#: 2000020428 Title: Immune Monitoring During ASP2215 Therapy in Relapsed/Refractory Acute Myeloid Leukemia (AML) P.I.: Nikolai Podoltsev, M.D. PhD Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: PRC Approval

Agency: Yale University ID#: 2000020258 Title: Study of mechanisms and biology of clonal hematopoiesis P.I.: Stephanie Halene, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual

Agency: Yale University ID#: 1609018346 Title: NCI 9924, A Phase I Trial of the Combination of Lenalidomide and Blinatumomab in Patients with Relapsed or Refractory Non-Hodgkins Lymphoma (NHL) (CIRB) P.I.: Iris Isufi, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual

Agency: Yale University ID#: 1607018080 Title: The National Myelodysplastic Syndromes (MDS) Study (CIRB) P.I.: Steven Gore, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual

Agency: Yale University ID#: 1607018056 Title: A Multicenter, Pivotal Phase 3 Study of Iomab-B Prior to Allogeneic Hematopoietic Cell Transplantation versus Conventional Care in Older Subjects with Active, Relapsed or Refractory Acute Myeloid Leukemia

P.I.: Stuart Seropian, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual Agency: Yale University ID#: 1606017990 Title: A Phase 1b Study Evaluating the Safety and Pharmacology of Atezolizumab (Anti-PD-L1 Antibody) Administered in Combination with Immunomodulatory Agents in Patients with Acute Myeloid Leukemia P.I.: Thomas Prebet, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Closed to Accrual Agency: Yale University ID#: 1606017906 Title: A Phase 1/2, Multicenter, Open-Label Study of FT-2102 as a Single Agent and in Combination with Azacitidine or Cytarabine in Patients with Acute Myeloid Leukemia or Myelodysplastic Syndrome with an IDH1 Mutation P.I.: Thomas Prebet, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual Agency: Yale University ID#: 1604017647 Title: A Phase 3, Multicenter, Randomized, Double-blind Study to Compare the Efficacy and Safety of Oral Azacitidine Plus Best Supportive Care Versus Placebo Plus Best Supportive Care in Subjects

with Red Blood Cell Transfusion-dependent Anemia and Thrombocytopenia Due to IPSS Lower-risk Myelodysplastic Syndromes P.I.: Thomas Prebet, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Closed to Accrual

Agency: Yale University ID#: 1604017640 Title: A phase 2, international, multicenter, randomized, open-label, parallel group study to evaluate the efficacy and safety of CC-486 (Oral Azacitidine) alone and in combination with Durvalumab

#### Manoj M. Pillai, M.D.

(MEDI4736) in subjects with myelodysplastic syndromes who fail to achieve an objective response to treatment with Azacitidine for injection or Decitabine P.I.: Amer Zeidan, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual Agency: Yale University ID#: 1604017585 Title: A Phase 2/3 Multicenter, Open-label, 3-arm, 2-stage Randomized Study of ASP2215 (Gilteritinib), Combination of ASP2215 Plus Azacitidine and Azacitidine Alone in the Treatment of Newly Diagnosed Acute Myeloid Leukemia with FLT3 Mutation in Patients Not Eligible for Intensive Induction Chemotherapy P.I.: Nikolai Podoltsev, M.D., PhD Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual Agency: Yale University ID#: 1603017438 Title: A Phase 2, Randomized, Controlled, Open-Label, Clinical Study of the Efficacy and Safety of Pevonedistat Plus Azacitidine Versus Single-Agent Azacitidine in Patients with Higher-Risk Myelodysplastic Syndromes, Chronic Myelomonocytic Leukemia, and Low-Blast Acute Myelogenous Leukemia P.I.: Amer Zeidan, MBBS Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Closed to Accrual Agency: Yale University ID#: 1603017335 Title: A Phase I-II Study of Triciribine Phosphate Monohydrate (PTX-200) Plus Cytarabine in Refractory or Relapsed Acute Leukemia P.I.: Thomas Prebet, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A

Project period: Status: IRB Initial Approval

Agency: Yale University ID#: 1603017334

Title: A randomized, multicenter, open-label, phase 2 study evaluating the efficacy and safety of Azacitidine subcutaneous in combination with Durvalumab (MEDI4736) in previously untreated subjects with higher-risk myelodysplastic syndromes (MDS) or in elderly (≥ 65 years) acute myeloid leukemia (AML) subjects not eligible for hematopoietic stem cell transplantation (HSCT) P.I.: Amer Zeidan, MBBS

Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Closed to Accrual

Agency: Yale University ID#: 1601017042 Title: A Phase 3, double-blind, randomized study to compare the efficacy and safety of Luspatercept (ACE-536) versus placebo for the treatment of anemia due to IPSS-R very low, low, or intermediate risk myelodysplastic syndromes in subjects with ring sideroblasts who require red blood cell transfusions P.I.: Amer Zeidan, MBBS Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Closed to Accrual

Agency: Yale University ID#: 1512016983 Title: A Phase I Study to Evaluate the Safety and Tolerability of MEDI4736 as Monotherapy or in Combination with Tremelimumab with or without Azacitidine in Subjects with Myelodysplastic Syndrome after Treatment with Hypomethylating Agents P.I.: Amer Zeidan, MBBS Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual

Agency: Yale University ID#: 1512016966 Title: Gemtuzumab Ozogamicin (Mylotarg [Registered]) Expanded Access Protocol For Treatment Of Patients In The United States With Relapsed/Refractory Acute Myelogenous Leukemia Who May Benefit From Treatment And Have No Access To Other Comparable/Alternative Therapy P.I.: Nina Kadan-Lottick, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: IRB Study Closure

Agency: Yale University

ID#: 1512016947 Title: A Phase 1, open-label, dose finding study of CC-90002, a monoclonal antibody directed against CD47, in subjects with acute myeloid leukemia and high-risk myelodysplastic syndrome P.I.: Amer Zeidan, MBBS Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual

Agency: Yale University ID#: 1511016815 Title: A Phase 1/2 Study of SL-401 as Consolidation Therapy for Adult Patients with Adverse Risk Acute Myeloid Leukemia in First CR, and/or Evidence of Minimal Residual Disease (MRD) in First CR P.I.: Thomas Prebet, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: IRB Study Closure

Agency: Yale University ID#: 1511016814 Title: A Study to Evaluate Imetelstat (JNJ-63935937) in Transfusion-Dependent Subjects with IPSS Low or Intermediate-1 Risk Myelodysplastic Syndrome (MDS) that is Relapsed/Refractory to Erythropoiesis-Stimulating Agent (ESA) Treatment P.I.: Thomas Prebet, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Closed to Accrual

Agency: Yale University ID#: 1510016733 Title: A Phase 1, Open-label, Dose-escalation, Multicenter Study to Evaluate the Tolerability, Safety, Pharmacokinetics, and Anti-tumor Activity of ADCT-402 in Patients with Relapsed or Refractory Bcell Lineage Acute Lymphoblastic Leukemia (B-ALL) P.I.: Amer Zeidan, MBBS Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Closed to Accrual Agency: Yale University ID#: 1510016699 Title: CTEP 9524: A Phase I Study of Pomalidomide Given at the Time of Lymphocyte Recovery Following Induction Timed Sequential Chemotherapy with Cytarabine, Daunorubicin and Etoposide (AcDVP16) in Patients with Newly Diagnosed Acute Myeloid Leukemia (AML) and High-Risk MDS P.I.: Amer Zeidan, MBBS Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Closed to Accrual

Agency: Yale University ID#: 1509016489 Title: A Phase 3 Open-label, Multicenter, Randomized Study of ASP2215 versus Salvage Chemotherapy in Patients with Relapsed or Refractory Acute Myeloid Leukemia (AML) with FLT3 Mutation P.I.: Nikolai Podoltsev, M.N. PhD Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Closed to Accrual

Agency: Yale University ID#: 1508016291REG Title: Analyzing the outcome of patients treated at Yale cancer center for a hematological disease : the Yale Hematology Registry P.I.: Thomas Prebet, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: IRB Initial Approval

Agency: Yale University ID#: 1508016268 Title: A Randomized Phase II Trial to Simultaneously Evaluate Two Schedules of the Histone Deacetylase Inhibitor Entinostat in Combination with 5-Azacytidine (5AC, NSC 102816) in Elderly Patients with Acute Myeloid Leukemia (AML) P.I.: Steven Gore, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual Agency: Yale University ID#: 1507016193 Title: A phase I-II randomized trial of a combination of Nintedanib/placebo in combination with induction chemotherapy for patients with refractory or first relapse acute myeloid leukemia P.I.: Thomas Prebet, M.D. Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual

Agency: Yale University ID#: 1505015796 Title: A Phase 1 Study Evaluating the Safety and Pharmacokinetics of ABBV-075 in Subjects with Advanced Cancer (WIRB) P.I.: Thomas Prebet Percent Effort: Direct costs per year: N/A Total costs for project period: N/A Project period: Status: Open to Accrual

Agency: Yale University ID#: 1411014856 Title: A Phase 1 study of ASP2215 in Combination with Induction and consolidation Chemotherapy in Patients with Newly Diagnosed Acute Myeloid Leukemia P.I. Nikolai Podoltsev, M.D. Percent effort: N/A (concurrent with clinical effort) Direct costs per year: N/A Total costs for project period: N/A Project period: Protocol opened 09/11/2014, Status: Open to Accrual

Agency: Yale University ID#: 1411014855 Title: A Randomized, Open Label, Phase 2 Study of the Gore, Steven Selective Inhibitor of Nuclear Export (SINE) Selinexor (KPT-330) Versus Specified Physician's Choice in Patients ≥ 60 Years Old with Relapsed/Refractory AML Who Are Ineligible for Intensive Chemotherapy and/or Transplantation P.I. Steven Gore, M.D. Role: Sub-Investigator Percent effort: N/A (concurrent with clinical effort) Direct costs per year: N/A Total costs for project period: N/A Project period: Protocol opened 06/10/2015, Status: IRB Study Closure

Agency: Yale University ID#: 1410014839 Title: Phase III, Multicenter, Randomized, Trial of CPX- 351 (Cytarabine: Daunorubicin) Liposome Injection versus Cytarabine and Daunorubicin in Patients 60-75 Years of Age with Untreated High Risk (Secondary) AML P.I. Nikolai Podoltsev, M.D. Role: Sub-Investigator Percent effort: N/A (concurrent with clinical effort) Direct costs per year: N/A Total costs for project period: N/A Project period: Protocol opened 9/21/2014, Status; Open to Accrual Agency: Yale University ID#: 1408014499 Title: A Phase 3 Open-Label Randomized Study of Quizartinib (AC220) Monotherapy Versus Salvage Chemotherapy in Subjects with FLT3-ITD Positive Acute Myeloid Leukemia (AML) Refractory To or Relapsed After First-line Treatment With or Without Hematopoietic Stem Cell Transplantation (HSCT) Consolidation P.I. Nikolai Podoltsev, M.D. Role: Sub-Investigator Percent effort: N/A (concurrent with clinical effort) Direct costs per year: N/A

Total costs for project period: N/A

Project period: Protocol opened 04/13/2015, Status: Closed to Accrual

Agency: Yale University ID#: 1408014408 Title: A Phase 1 study of lpilimumab in relapsed and refractory high risk myelodysplastic syndrome and acute myeloid leukemia with minimal residual disease P.I. Amer Zeidan, M.D. Role: Sub-Investigator Percent effort: N/A (concurrent with clinical effort) Direct costs per year: N/A Total costs for project period: N/A Project period: Protocol opened 03/13/2015, Status: Closed to Accrual

Agency: Alliance Cooperative Group ID#: 1404013770 Title: A Randomized Phase III Study of Bendamustine, Plus Rituximab Versus Ibrutinib Plus RituximabVersus Ibrutinib Alone in Untreated Older Patients (>65 Years of Age) with Chronic Lymphocytic Leukemia (CLL) (CIRB) PI. Iris Isufi, M.D. Role: Sub-Investigator Percent effort: N/A (concurrent with clinical effort) Direct costs per year: N/A Total costs for project period: N/A Project period: Protocol opened 10/18/2014, Status: Closed to Accrual

Agency: Yale University ID#: 1402013426 Title: (E1910) A Phase III Randomized Trial of Blinatumomab for Newly Diagnosed BCR-ABLnetive B lineage Acute Lymphoblastic Leukemia in adults PI. Steven Gore, M.D. Role: Sub-Investigator Percent effort: N/A (concurrent with clinical effort) Direct costs per year: N/A Total costs for project period: N/A Project period: Protocol opened 07/17/2015, Status: Open to Accrual Agency: Yale University ID#: 1404013769 Title: A Phase II Simon Two-Stage Study of the Addition Gore, Steven of Pracinostat to a Hypomethylating Agent (HMA) in Patients with Myelodysplastic Syndrome (MOS) Who Have Failed to Respond or Maintain a Response to the HMA Alone P.I. Nikolai Podoltsev, M.D. Role: Sub-Investigator Percent effort: N/A (concurrent with clinical effort) Direct costs per year: N/A Total costs for project period: N/A Project period: Protocol opened 09/11/2014, Status: IRB Study Closure Agency: Yale University ID#: 1402013391 Title: E2905: Randomized Phase Ill Trial Comparing the Gore, Steven Frequency of Major Eroid Response t'ER) to Treatment with Lenali omide (Revlimid) one and in Combination with Epoetin Alfa rrocrtgin Subjects with Low- or Intermediate-1 risk M S and Symptomatic Anemia P.I. Steven Gore, M.D. Role: Sub-Investigator Percent effort: N/A (concurrent with clinical effort) Direct costs per year: N/A Total costs for project period: N/A Project period: Open 07/17/2014, Status: Closed to Accrual Agency: Yale University ID#: 1401013259 Title: Specimen Repository for Hematologic Diseases P.I. Stephanie Halene, M.D. Role: Sub-Investigator Percent effort: N/A (concurrent with clinical effort)

Direct costs per year: N/A Total costs for project period: N/A Project period: Open 02/22/2014, Status: Open to Accrual

Agency: Yale University ID#: 1305012088 Title: A Randomized Phase Ill Sb.Jdy of Standard Cytarabine plus Daunomycin (7+ Therapy versus Idarubicin with High Doserabine (IA) with or without Vorinostat (IA+ younger Patients with Previously Untrea Acute Myeloid Leukemia (AML P.I. Nikolai Podoltsev, M.D. Percent effort: N/A (concurrent with clinical effort) Direct costs per year: N/A Total costs for project period: N/A Project period: Project opened 07/17/2015, Status: Closed to Accrual Agency: Yale University ID#: 1302011505 Title: A Phase 1-2, Dose Escalation, Multicenter Study of Two Subcutaneous Regimens of SGI-110, a DNA Hypomethylating Agent, in Subjects with Intermediate or Hr-Risk Mtflodysplastic Syndromes DS or Acute Myelogenous Leukemia (A L) P.I. Nikolai Podoltsev, M.D. Role: Sub-Investigator Percent effort: N/A Percent effort: N/A (concurrent with clinical effort) Direct costs per year: N/A Total costs for project period: N/A Project period: Protocol opened 9/12/2914, Status: IRB Study Closure Agency: Yale University ID#: 1301011417 Title: An Open-label, Randomized Phase 3 Study of Inotuzumab Ozogamicin Comared to a Defined Investigator's Choice in Adult patients with Relapsed or Refractory CD22-Positive Acute Lymphoblastic Leukemia (ALL) P.I. Nikolai Podoltsev, M.D. Role: Sub-Investigator Percent effort: N/A (concurrent with clinical effort) Direct costs per year: N/A Total costs for project period: N/A Project period: Protocol opened 12/3/2011, Status: IRB Study Closure Agency: Yale University ID#: 0803003627 Title: Immunology and Pathobiology of Plasma Cell Disorders P.I. Madhav Dhodapkar, M.D. Role: Sub-Investigator

Percent effort: N/A (concurrent with clinical effort)

Direct costs per year: N/A

Total costs for project period: N/A

Project period: Protocol opened 09/11/2014, Status: IRB Study Closure