

Curriculum Vitae

Personal

Enkhtsetseg Purev, MD, PhD
Assistant Professor
University of Colorado School of Medicine
1665 Aurora court, Mail stop F754
Aurora CO 80045

Education

| <u>Institution</u> <u>Completed</u> | <u>Degree/Program</u> | <u>Date</u> |
|--|--------------------------------|-------------|
| Mongolian National Medical University | MD | 1996 |
| Temple University | PhD | 2005 |
| University of Medicine and Dentistry of NJ (UMDNJ) | Internship and Residency | 2012 |
| National Institute of Health | Hematology/Oncology Fellowship | 2015 |

Academic appointments

| <u>Institution</u> | <u>Position</u> | <u>Date</u> |
|------------------------|---------------------|--------------|
| Wistar Institute | Visiting Scientist | 1997-2000 |
| Yale University | Postdoctoral fellow | 2005-2008 |
| Harvard University | Postdoctoral fellow | 2008-2009 |
| University of Colorado | Assistant Professor | 2015-present |

Other Professional positions

| <u>Organization</u> | <u>Position</u> | <u>Date</u> |
|-------------------------|-----------------|-------------|
| Mongolian Hospital #III | Clinician | 1996-1997 |

Honors, special recognitions and awards

| <u>Organization</u> | <u>Award</u> | <u>Date</u> |
|---|-------------------------------|-------------|
| Susan G. Komen Foundation | Young Investigator Award | 2000 |
| Florence Gloria Freedman | Award for Cancer Research | 2005 |
| James Hudson Brown-Alexander Brown Coxe | Postdoctoral fellowship Award | 2007 |
| UMDNJ | Resident of the Year Award | 2012 |
| Conquer Cancer Foundation | Young Investigator Award | 2015 |
| University of Colorado | Innovator Award | 2017 |
| University of Colorado | Innovator Award | 2018 |
| University of Colorado | Rising Star Award | 2018 |

Membership in professional organizations

American Association of Cancer Research
American College of Physicians
American Society of Clinical Oncology
American Society of Hematology

America Society of Gene Therapy
Society of Immunotherapy of Cancer

Leadership positions

| <u>Organization</u> | <u>Position</u> | <u>Date</u> |
|--|------------------------------------|--------------|
| NIH | Chief Clinical Fellow | 2014-2015 |
| NIH hematology Branch Nocturnist Program | Program Co-Director | 2013-2015 |
| NHLBI stem cell transplant education Program | Program Co-Director | 2013-2015 |
| University of Colorado | Clinical Cellular Therapy Director | 2016-present |

Major Committee and Service Responsibilities

| <u>Committees</u> | <u>Date</u> |
|--|--------------|
| University of Colorado Data Safety Monitoring Committee (DSMB) | 2016-2017 |
| NCCN guideline panel for CML | 2016-present |
| University of Kansas DSMB | 2017-present |
| Institutional Biosafety Committee (IBC) | 2017-present |
| NCCN guideline panel for ALL | 2019-present |

Licensure and board certification

ABIM Board Certification Internal Medicine (2012)
ABIM Board Certification Hematology (2015)
ABIM Board Certification Oncology (2015)
Medical License in Maryland (2012-2015)
Medical License in Colorado (2015-present)

Review and referee work

| <u>Journal</u> | <u>Date</u> |
|--|--------------|
| Ad Hoc reviewer for PloS One | 2016-present |
| Ad Hoc reviewer for Journal of Leukocyte Biology | 2016-present |
| Ad Hoc reviewer for DOD grant | 2017-present |
| Ad Hoc reviewer for Therapeutic Advances in Hematology | 2018-present |
| Ad Hoc reviewer for Drug discovery and Therapy | 2018-present |

Invited extramural lectures, presentations and visiting professorships

Local

2016 "CAR T Cell Therapy" Grand Round BMT Department
2016 "Myelodysplastic Syndrome" Leukemia Lymphoma Society
2016 "CAR T Cell Therapy in Treatment of Cancer" Cancer retreat, University of Colorado
2016 "Landscape of adult ALL" Grand Round BMT Department
2017 "CAR T cell Therapy" DOM Research and Innovation Conference, University of Colorado
2018 "CAR T Cell Therapy" Leukemia Lymphoma Society
2018 "Bone Marrow Failure Syndrome" Grand Round BMT Department
2018 "Adoptive T Cell Therapy" Grand Round BMT Department

2018 “CML” Grand Round BMT Department

2019 “Adult ALL” Grand Round BMT Department

National

2015 “Bone Marrow Transplant: Understanding BMT, Before and During” Aplastic anemia and MDS International Foundation, Nov 2015, Tampa, Florida

2015 “Bone Marrow Transplant: Managing Post BMT – Health and Support” Aplastic anemia and MDS International Foundation, Nov 2015, Tampa, Florida

2019 “Hematologic and Oncologic emergencies” Grand Round, Drexel University, Philadelphia, PA

International

2019 “Updates on CAR T cell therapy” Bone Marrow Transplant Center, St. Petersburg Russia

Teaching Record

Medical Students

201–present Small Group Facilitator, Blood & Lymph Block Course, MSI students, University of Colorado
Four week block

2015- Teaching attending physician, inpatient and outpatient BMT/blood cancer service, University of Colorado

Internal Medicine Residents

2015-present teaching attending physician, inpatient and outpatient BMT/blood cancer service, University of Colorado

Hematology/Oncology Fellows

2015-present Didactic lectures on the topic of cellular immunotherapy, ALL, BMT, Bone marrow failure, CML, MPN.

2015–present Teaching sent Attending physician, inpatient and outpatient BMT/blood cancer service, University of Colorado

Supervision and bedside teaching

Current Mentees

2018-present Andrew Kent, MD (Medical Student); Internal Medicine Resident, University of Colorado

2019 – present J. Robert Chang PhD, Post-doctoral Fellow

Past Mentees

2013-2015 Puong Vo, MD (Hematology fellow); Current position: Assistant Professor, Fred Hutch Bone Marrow Transplant Center

201 –2018 Brian Schulte, MD (Internal medicine Resident); Current position: Hematology/Oncology Fellow, University of Chicago

Grant support

Active

2016-2018: Co-PI, Edward P. Evan Foundation “Adoptive CD123 CAR T-cell therapy for the treatment of myelodysplastic syndrome”

2018-present: Co-PI, Edward P. Evan Foundation “Adoptive CD123 CAR T-cell therapy for the treatment of myelodysplastic syndrome”

2018-present: PI, University of Colorado Cancer Center “Establishment of Immunotherapy at University of Colorado”

Past

2006-2007: PI, James Hudson Brown-Alexander Brown Coxe Foundation “Characterization of differentiation, signaling and function of Cbl-b/-osteoclasts and identification of unique structural features of Cbl-b”

2014-2015: PI, Alexion Pharmaceutical “Eculizumab for treatment of alloimmune platelet refractoriness”

Bibliography

Peer-reviewed journals

1. Birebent, B, **Purev E.**, Akis, N., Li, W., Staib, L., Somasundaram, R., Mitchel, E., Nair, S. and Herlyn, D. “Recombinant Colorectal cancer (CRC) vaccines”. *J. of human virology. Jul 2(4): 203-10, 1998*
2. Basak S., Eck S., Gutzmer R., Smith AJ., Birebent B., **Purev E.**, Staib L., Somasundaram R., Zaloudik J., Li W., Jacob L., Mitchell E., Speicher D. and Herlyn D. “Colorectal cancer vaccines: antiidiotypic antibody, recombinant protein, and viral vector”. *Annals of the NY Academy of Sciences Jun 910:237-53, 2000*
3. Staib L., Birebent B., Somasundaram R., **Purev E.**, Braumuller H., Leeser C., Kuttner N., Li W., Zhu D., Diao J., Wunner W., Speicher D., Beger HG., Song H. and Herlyn D. “Immunogenicity of recombinant GA733-2E antigen (CO17-1A, EGP, KS1-4, KSA, Ep-CAM) in gastro-intestinal carcinoma patients”. *Int. J. of Cancer Apr 92(1):79-87, 2001*
4. Birebent B., Somasundaram R., **Purev E.**, Li W., Mitchell E., Hoey D., Bloom E., Mastrangelo M., Maguire H., Harris DT., Staib L., Braumuller H., Leeser C., Kuttner N., Beger H.G. and Herlyn D. “Anti-idiotypic antibody and recombinant antigen vaccines in colorectal cancer patients”. *Critical Reviews in Oncology-Hematology Jul-Aug 39(1-2):107-13, 2001*
- 5.
6. Birebent B., Koido T., Mitchell E., Li W., Somasundaram R., **Purev E.**, Hoey D., Mastrangelo M., Maguire H., Harris DT., Nair S., Cai E. and Herlyn D. “Anti-idiotypic antibody (ab2) vaccines: coupling of Ab2 BR3E4 to KLH increases humoral and/or cellular immune responses in animals and colorectal cancer patients”. *J. of Cancer Research & Clinical Oncology Oct 127:27-33, 2001*
7. Birebent B, Mitchell E, Akis N, Li W, Somasundaram R, **Purev E**, Hoey D, Mastrangelo M, Maguire H, Harris DT, Nair S, Cai D, Zhang T, Herlyn DM. “Monoclonal anti-idiotypic antibody mimicking the gastrointestinal carcinoma-associated epitope CO17-1A elicits antigen-specific humoral and cellular immune responses in colorectal cancer patients.” *Vaccine Apr2;21(15):1601-12, 2003*
8. Basak S, Birebent B, **Purev E**, Somasundaram R, Maruyama H, Zaloudik J, Swoboda R, Strittmatter W, Li W, Luckenbach A, Song H, Li J, Sproesser K, Guerry D, Nair S, Furukawa K, Herlyn D. “Induction of cellular immunity by anti-idiotypic antibodies mimicking GD2 ganglioside.” *Cancer Immunol Immunother. Mar 52(3):145-54, 2003*
9. Vuocolo S, **Purev E**, Zhang D, Bartek J, Hansen K, Soprano DR, Soprano KJ. “Protein phosphatase 2A associates with Rb2/p130 and mediates retinoic acid-induced growth suppression of ovarian carcinoma cells.” *J Biol Chem. Oct 24;278(43):41881-9, 2003*
10. Herlyn D, Birebent B, Akis N, **Purev E**, Somasundaram R, Mitchell E, Maguire H, Staib L, Mastrangelo M. “Colon cancer antigen and anti-idiotype vaccines.” *Cancer Chemother Biol Response Modif. 21:287-98, 2003*
11. **Purev E**, Soprano DR, Soprano KJ. “Effect of all-trans retinoic acid on telomerase activity in ovarian cancer cells.” *J Exp Clin Cancer Res. Jun;23(2):309-16, 2004*
12. **Purev E**, Cai D, Miller E, Swoboda R, Mayer T, Klein-Szanto A, Marincola FM, Mick R, Otvos L, Wunner W, Birebent B, Somasundaram R, Wikstrand CJ, Bigner D, Demichele A, Acs G, Berlin JA, Herlyn D. “Immune Responses of Breast Cancer Patients to Mutated Epidermal Growth Factor Receptor (EGF-RvIII, and de2-7 EGF-R).” *J Immunol. Nov15;173(10):6472-6480, 2004*
13. Furth EE, Li J, **Purev E**, Solomon AC, Rogler G, Mick R, Putt M, Zhang T, Somasundaram R, Swoboda R, Herlyn D. “Serum antibodies to EpCAM in healthy donors but not ulcerative colitis patients” *Cancer Immunol. Immunother. Jul 21:1-10, 2005*

14. Pappas J., Jung WJ, Barda AK, Lin WL, Fincke JE, **Purev E**, Radu M, Guaghan J, Helm CW, Hernandez E, Freedman RS, Platsoucas CD, "Substantial proportions of identical beta-chain T cell receptor transcripts are present in epithelial ovarian carcinoma tumor". *Cellular Immunology Apt. 234*: 81-101, 2005
15. **Purev E**, Giordano A, Soprano D, Soprano K "Interaction of PP2A catalytic subunit with Rb2/p130 is required for all-trans retinoic acid suppression of ovarian carcinoma cell growth" *J. Cellular Phys. Oct 206*: 495-502, 2006
16. Wei Q, Clarke L, Scheidenhelm DK, Qian B, Tong A, Sabha N, Karim Z, Bock NA, Reti R, Swoboda R, **Purev E**, Lavoie JF, Bajenaru ML, Shannon P, Herlyn D, Kaplan D, Henkelman RM, Gutmann DH, Guha A. "High-grade glioma formation results from postnatal PTEN loss or mutant epidermal growth factor receptor expression in a transgenic mouse glioma model." *Cancer Res. Aug 1;66(15)*:7429-37, 2006
17. Soprano KJ, **Purev E**, Vuocolo S, Soprano D "Rb2/p130 and protein phosphatase 2A: key mediators of ovarian carcinoma cell growth suppression by all-trans retinoic acid" *Oncogene Aug 28,25-38*: 5315-25, 2006
18. Sanjay A, Miyazaki T, Itzsein C, **Purev E**, Horne WC, Baron R. "Identification and functional characterization of a Src SH3 domain-binding site on cbl." *FEBS Journal Dec 273(23)*:5442-56, 2006
19. **Purev E**, Neff L, Horne WC, Baron R. "c-Cbl and Cbl-b act redundantly to protect osteoclasts from apoptosis and to displace HDAC6 from {beta}-tubulin, stabilizing microtubules and podosomes." *Mol Biol Cell. Sep 20(18)*:4021-30, 2009
20. **Purev E**, Soprano D, Soprano K "PP2A interaction with Rb2/p130 mediates translocation of Rb2/p130 into the nucleus in all-trans retinoic acid treated ovarian carcinoma cells" *J Cellular Physiol April 226(4)*:1027-34, 2011
21. **Purev E**, Dumitriu B, Hourigan CS, Young NS, Townsley DM "Translocation (8;21) acute myeloid leukemia presenting as severe aplastic anemia" *Leukemia Res. Rep 3(2)*:46-8, 2014
22. **Purev E**, Winkler T, Danner R, Fahle GA, Cook L, Zerr D, Jerome KR, Childs RW "Engraftment of Donor Cells with Germ-Line Integration of HHV6 Mimics High Copy Number HHV6 Reactivation Following Cord Blood/Haplo Transplantation" *Blood Aug 14 124(7)*:1198-9, 2014
23. Mankodi A, Grunseich C, Skov M, Cook L, Aue G, **Purev E**, Bakar D, Lehky T, Jurkat-Rott K, Pederson TH, Childs RW "Divalent cation-responsive myotonia and muscle paralysis in skeletal muscle sodium channelopathy" *Neuromuscul Disord Nov 25(11)*:908-12, 2015
24. Pallera A, Altman JK, Berman E, Abboud CN, Bhatnagar B, Curtin P, DeAngelo DJ, Gotlib J, Hagelstrom RT, Hobbs G, Jagasia M, Kantarjian HM, Kropf P, Metheny L, Moore JO, Ontiveros E, Purev E, Quiery A, Reddy VV, Rose MG, Shah NP, Smith BD, Snyder DS, Sweet KL, Tibes R, Yang DT, Gregory K, Sundar H, Deininger M, Radich JP "NCCN Guidelines Insights: Chronic Myeloid Leukemia, Version 1.2017" *J Natl Compr Canc Netw Dec 2016 14(12)*: 1505-12.
25. Pantin J, Purev E, Tian X, Cook L, Donohue-Jerussi T, Cho E, Reger R, Hsieh M, Khuu H, Calandra G, Geller NL, Childs RW "Effect of high-dose plerixafor on CD34+ cells mobilization in healthy stem-cell donors: results of a randomized crossover trial" *Hematologica March 102(3)*:600-609, 2017
26. **Purev E**, Tian X, Aue G, Pantin J, Vo P, Shalabi R, Reger R, Cook L, Ramos C, Cho E, Worthy T, Khuu H, Stroncek D, Young N, Childs RW "Allogeneic transplantation using CD34+ selected peripheral blood progenitor cells combined with non-mobilized donor T-cells for refractory severe aplastic anemia" *Br J Hem March 176(6)*:950-960, 2017
27. Nooruddin Z, Miltgen N, Wei Q, Schowinsky J, Pan Z, Tobin J, **Purev E**, Gutman JA, Robinson W, Pollyea DA "Changes in allele frequencies of CSF3R and SETBP1 mutations and evidence of clonal evolution in a chronic neutrophilic leukemia patient treated with ruxolitinib" *Hematologica Feb 2017*

28. **Purev E**, Fry T “Chimeric Antigen Receptor T cells for the treatment of lymphoma” *Ann of Lymphoma* Nov 2017
29. Sharma P, Pollyea DA, Smith CA, **Purev E**, Kamdar M, Haverkos B, Sherbenou D, Rabinovitch R, Hammes A, Gutman JA “Thiotepa based intensified reduced-intensity conditioning adult double-unit cord blood HSCT results in decreased relapse rate and improved survival compared to transplantation following standard reduced-intensity conditioning: a retrospective cohort comparison.” *Biol Blood Marrow Transplant* April 2018
30. Wei Z, Jordan K, Schulte B, **Purev E** «Characterization of clinical grade CD19 chimeric antigen receptor T cells manufactured using automated CliniMACS Prodigy System» Drug Design, development and therapy, 12:3343-3356, 2018
31. Ye H, Adane B, Khan N, Alexeev E, Nusbacher N, Minhajuddin M, Stevens BM, Winters AC, Lin X, Ashton JM, **Purev E**, Xing L, Pollyea DA, Lozupone CA, Serkova NJ, Colgan SP, Jordan CT. Subversion of Systemic Glucose Metabolism as a Mechanism to Support the Growth of Leukemia Cells» *Cancer Cell* 2018
32. Pallera A, Altman JK, Berman E, Abboud CN, Bhatnagar B, Curtin P, DeAngelo DJ, Gotlib J, Hagelstrom RT, Hobbs G, Jagasia M, Kantarjian HM, Kropf P, Metheny L, Moore JO, Ontiveros E, **Purev E**, Quiery A, Reddy VV, Rose MG, Shah NP, Smith BD, Snyder DS, Sweet KL, Tibes R, Yang DT, Gregory K, Sundar H, Deininger M, Radich JP “NCCN Guideline Insights: Chronic Myeloid Leukemia, Version 1.2017” *J Natl Compr Canc Netw* Dec;14(12):1505-1512, 2016.
33. Sharma P, King G, Shinde S, **Purev E**, Jimeno A “Axicabtagene ciloleucel for the treatment of relapsed/refractory aggressive B-cell non-Hodgkin's lymphoma” *Drugs today*, May 2018
34. Radich JP, Deininger M, Abboud CN, Altman JK, Berman E, Bhatia R, Bhatnagar B, Curtin P, DeAngelo DJ, Gotlib J, Hobbs G, Jagasia M, Kantarjian HM, Maness L, Metheny L, Moore JO, Pallera A, Pancari P, Patnaik M, Purev E, Rose MG, Shah NP, Smith BD, Snyder DS, Sweet KL, Talpaz M, Thompson J, Yang DT, Gregory KM, Sundar H. “Chronic Myeloid Leukemia, Version 1.2019, NCCN Clinical Practice Guidelines in Oncology.” *J Natl Compr Canc Netw* Sept 16(9): 1108-1135, 2018
35. Pollyea DA, Stevens BM, Jones CL, Winters A, Pei S, Minhajuddin M, D'Alessandro A, Culp-Hill R, Riemondy KA, Gillen AE, Hesselberth JR, Abbott D, Schatz D, Gutman JA, **Purev E**, Smith C, Jordan CT. “Venetoclax with azacitidine disrupts energy metabolism and targets leukemia stem cells in patients with acute myeloid leukemia.” *Nat Med*. Dec;24(12):1859-1866, 2018

Book Chapters

1. Chang JR, **Purev E**, Kuo WP. Current and evolving genomic-based technologies. *Genomics, Personalized Medicine, and Oral Disease*, 1st ed. Ed. Stephen T Sonis. New York: Springer International Publishing, 2015:11-34