

CURRICULUM VITAE

Laijun Lai, M.D.

Professional Experience:

- 1995-2001 Postdoctoral Fellow, Department of Pathology
University of Connecticut Health Center, Farmington, CT
- 2001-2002 Scientist in Research Antigen
Protein Science Corporation, Meriden, CT
- 2002-2011 Assistant Professor, Department of Immunology and University of Connecticut
Stem Cell Institute
University of Connecticut Health Center, Farmington, CT
- 2011-2021 Associate Research Professor, Department of Allied Health Sciences and
University of Connecticut Stem Cell Institute
University of Connecticut, Storrs, CT
- 2021- Research Professor, Department of Allied Health Sciences and University of
Connecticut Stem Cell Institute
University of Connecticut, Storrs, CT

Patents:

1. Goldschneider I and **Lai L**. “Hybrid Cytokine of IL-7 and β -chain of Hepatocyte Growth Factor” US patent No. 6,749,847.
2. Goldschneider I. and **Lai, L**. “Nucleic acids encoding a chimeric polypeptide comprising IL-7 and HGF-beta chain and methods of use” US patent No. 7,578,998B2.
3. **Lai L**. Reagents and Methods for Treating Cancer and Autoimmune Disease, International Publication number WO 2020/014097.

Research Support:

Active

1. Modeling and Treating T cell immunodeficiency in CHARGE syndrome by ESC- and iPSC-derived cells
2/1/2023-1/31/2028
Role: Principal Investigator
NIH R01
Total award: \$2,356,927
2. Treating T cell immunodeficiency among older adults by a recombinant Foxn1 fusion protein
6/15/2021-5/31/2026

Role: Principal Investigator
NIH R21/R33
Total Award: \$1,891,750

3. The effects of BTNL2 on experimental autoimmune encephalomyelitis
3/4/2021-2/30/2023, NCE to 2/30/2024
Role: Principal Investigator
NIH R21
Total Award: \$442,750
4. Targeting TAPBPL in antitumor immunotherapy
4/1/2022-3/31/2024
Role: Principal Investigator
SPARK grant
Total Award: \$100,000

Completed

1. Transplantation of ESC-derived thymic epithelial progenitors expressing autoantigen(s) ameliorating experimental autoimmune encephalomyelitis
2/15/2016-1/31/2021 (NCE to 1/31/2022)
Role: Principal Investigator
NIH R01
Total Award: \$1,951,981
2. Modeling and correcting immunodeficiency in DiGeorge syndrome by ESC- and iPSC-derived thymic epithelial cells
6/15/2017-6/14/2021
Role: Principal Investigator
Established Investigator Grant from the CT Stem Cell Program, CT Innovations
16-RMB-UCONN-02
Total Award: \$675,500
3. Inducing immune tolerance to hESCs and their derivatives by the hESC-derived thymic epithelial cells
11/01/12-10/31/16
Role: Principal Investigator
Established Investigator Grant from the CT Stem Cell Program, CT Innovations
12-SCB-UCON-02
Total Award: \$750,000
4. Generation of hematopoietic stem cells and T cell progenitors from human ESCs
10/01/10-9/30/14
Role: Principal Investigator

Established Investigator Grant from CT Stem Cell Program
CT Innovations
10SCB12
Total Award: \$1,000,000

5. Immunotherapy of melanoma and colon cancer by a recombinant IL-7/HGF β protein
10/1/10-8/31/13
Role: Principal Investigator
Connecticut Biomedical Research Program, #2011-0145
Total Award: \$439,243
6. Anti-tumor activity induced by a novel hybrid cytokine
07/01/08-02/28/11
Role: Principal Investigator
Connecticut Biomedical Research Program, #2009-0098
Total Award: \$309,688
7. Cytokine induced production of transplantable hematopoietic stem cells from human ES cells
09/1/08-02/28/11
Role: Principal Investigator
08-SCA-UHC-009
A Seed Grant from CT Stem Cell Program, Connecticut Innovation
Total Award: \$200,000
8. Antitumor activity induced by a hybrid cytokine IL-7/HGF β
7/2007-6/2009
Role: Principal Investigator
IRG-06-002-01, American Cancer Society

Selected Publications:

1. **Lai L**, Chen F, McKenna SD, and Goldschneider I. Identification of an IL-7-associated pre-pro-B cell growth-stimulating factor (PPBSF). II. PPBSF is a covalently-linked heterodimer of IL-7 and an Mr 30,000 cofactor. *Journal of Immunology*, 160:2280-2286, 1998.
2. McKenna SD, Chen F, **Lai L**, and Goldschneider I. Identification of an IL-7-associated pre-pro-B cell growth-stimulating factor (PPBSF). I. Production of a non-IL-7 component of PPBSF by bone marrow stromal cells from IL-7 gene-deleted mice. *Journal of Immunology*. 160:2272-2279, 1998.
3. **Lai L** and Goldschneider I. Identification of a hybrid cytokine of IL-7 and the β chain of hepatocyte growth factor/scatter factor/scatter factor. *Journal of Immunology*, 167: 3550-3554, 2001.
4. Wei C, **Lai L** and Goldschneider I. Pre-pro-B cell growth-stimulating factor (PPBSF) upregulates IL-7R α chain expression and enables pro-B cells to respond to monomeric IL-7. *Journal of Interferon and Cytokine Research* 22:823-832, 2002.

5. **Lai L**, Zeff RA, and Goldschneider I. A recombinant single-chain IL-7/HGF β hybrid cytokine induces juxtacrine interactions of the IL-7 and HGF (c-met) receptors and stimulates the proliferation of CFU-S12, common lymphoid progenitors (CLP) and pre-B cells. *Blood*. 107:1776-1784, 2006.
6. **Lai L** and Jin J. Generation of thymic epithelial progenitors from mouse embryonic stem cells. *Stem cells*. 27:3012-3020, 2009.
7. **Lai L**, Jin J and Goldschneider I. In vivo antitumor activity of a recombinant IL-7/HGF β hybrid cytokine in mice. *Cancer Research*. 71:61-67, 2011.
8. **Lai L**, Cui C, Jin J, Hao Z, Zhen Q, Ying M, Boyd R and Zhao Y. Mouse embryonic stem cell-derived thymic epithelial cell progenitors enhance T cell reconstitution after allogeneic bone marrow transplantation. *Blood*, 118:3410-3418, 2011.
9. **Lai L**, Jin J and Goldschneider I. A human recombinant IL-7/HGF alpha chain hybrid cytokine enhances T cell regeneration after bone marrow transplantation. *Transplantation*, 92:516-522, 2011.
10. Jin J, Goldschneider I and **Lai L**. *In vivo* administration of the rIL-7/HGF β hybrid cytokine efficiently restores the thymopoiesis and naïve T cell generation in lethally-irradiated mice after syngeneic bone marrow transplantation. *Journal of Immunology*, 186: 1915-1922, 2011.
11. **Lai L**, Zhang M and Goldschneider I. The recombinant IL-7/HGF β efficiently induces transplantable murine hematopoietic stem cells. *Journal of Clinical Investigation*. 122(10):3552-3562. 2012.
12. Zhang M, Shi J, Huang Y, **Lai L**. Expression of canonical WNT/beta-CATENIN signaling components in the developing human lung. *BMC Dev Biol*. 12(1):21-25. 2012.
13. **Lai L** Zhang M, Song Y, and Rood D. Recombinant IL-7/HGF β hybrid cytokine enhances T cell recovery following allogeneic hematopoietic stem cell transplantation. *Plos ONE* 8(12): e82998, 2013.
14. Yan Y, Su M, Song Y, Tang Y, Tian XC, Rood D and **Lai L**. Tbx1 Modulates Endodermal and Mesodermal Differentiation from Mouse Induced Pluripotent Stem cells. *Stem cells and Development*. Jul 1, 23(13):1491-500, 2014
15. Song Y, Su M, Panchatsharam P, Rood D, and **Lai L**. c-Met signaling is required for efficient postnatal thymic regeneration and repair in mice. *Immunology*. 144(2):245-253, 2015
16. Tran TH, Nguyen CT, Gonzalez-Fajardo L, Hargrove D, Song D, Deshmukh P, Mahajan L, Ndaya D, **Lai L**, Kasi RM, Lu X. Long circulating self-assembled nanoparticles from cholesterol-containing brush-like block copolymers for improved drug delivery to tumors. *Biomacromolecules*. 15(11):4363-75, 2014.
17. Su M, Song Y, He Z, Hu R, Rood D, and **Lai L**. Administration of embryonic stem cell-derived thymic epithelial progenitors expressing myelin oligodendrocyte glycoprotein induces antigen-specific tolerance and ameliorates EAE. *J Autoimmun*. 58:36-47, 2015.
18. Su M, Hu R, Jin J, Yan Y, Song Y, Sullivan R, and **Lai L**. Efficient *in vitro* generation of functional thymic epithelial progenitors from human embryonic stem cells. *Scientific Reports*, 5: 9882, 2015.
19. Song Y, Su M, Zhu J, Di W, Liu Y, Hu R, Rood D, and **Lai L**. Recombinant FoxN1 protein enhances T cell regeneration after bone marrow transplantation. *European Journal of Immunology*, accepted, manuscript online: 29 APR 2016; DOI: 10.1002/eji.201546196. PMID: 27125859.

20. Hu R, Liu Y, Su M, Song Y, Rood D, and **Lai L**. Transplantation of donor-origin mouse embryonic stem cell-derived thymic epithelial progenitors prevents the development of chronic graft-versus-host disease in mice. *Stem Cells Transl Med*. 2017 Jan;6(1):121-130.
21. Song Y, Liu Y, Hu R, Su M, Rood D, and **Lai L**. A recombinant IL-7/IL-15 hybrid cytokine enhances antitumor immunity in mice. *Molecular Cancer Therapeutics*, 15(10):2413-2421, 2016. PMID: 27474151.
22. Hu R, Liu Y, Song Y, Su M, Liu X, Rood D, and **Lai L**. Recombinant IL-7/HGF β hybrid cytokine separates acute graft-versus-host-disease from graft-versus-tumor activity by altering donor T cell trafficking. *Br J Haematol*. 2016 Nov;175(3):505-516
23. Wang S, Chen W, Wang Z, Li X, Lin S, Gao C, Huang Y, Luo D, Li J, Zi Y, Yi Z, Lin Y, **Lai L** & Pan L. High expression of FAMLF is associated with clinical response in patients with de novo acute myeloid leukemia. *LEUKEMIA & LYMPHOMA*, 2016 VOL. 57, NO. 11, 2727–2730
24. Han F, Hu R, Su M, Yu Y, Yang H, and **Lai L**. A human recombinant IL-7/HGF β hybrid cytokine enhances antitumor immunity in Mice. *Am J Cancer Res*. 2017;7(8):1714-1723
25. Su M, Hu R, Song Y, Liu Y, and **Lai L**. Targeted deletion of c-Met in thymic epithelial cells leads to an autoimmune phenotype. *Immunol Cell Biol*. 2018, 96(2):229-235,
26. Su M, Lin Y, Cui C, Tian X, Lu X, He Z, **Lai L**. ESC-derived thymic epithelial cells expressing MOG prevents EAE by central and peripheral tolerance mechanisms. *Cell Immunol*. 2017, 322:84-91.
27. Cui C, Tian X, Lin Y, Su M, Chen Q, Wang SY, **Lai L**. In vivo administration of recombinant BTNL2-Fc fusion protein ameliorates graft-versus-host disease in mice. *Cell Immunol*. 2018. Epub 2018/11/06. doi: 10.1016/j.cellimm.2018.10.008. PubMed PMID: 30389093.
28. Cui C, Su M, Lin Y, **Lai L**. A CD300c-Fc Fusion Protein Inhibits T Cell Immunity. *Frontiers in Immunology*. 2018;9(2657). doi: 10.3389/fimmu.2018.02657.
29. Tian X, Cui C, Lin Y, Su M, **Lai L**. BTNL2-Ig protein attenuates type 1 diabetes in NOD mice. *Adv Healthc Mater*. 2019 May;8(9):e1800987.
30. Su M, Lin Y, He Z, **Lai L**. Transplantation of MHC-mismatched Mouse Embryonic Stem Cell-Derived Thymic Epithelial Progenitors Prevents Autoimmune Diabetes. *Stem Cell Res Ther*. 2019 Aug 6;10(1):239.
31. Lin Y, Cui C, Su M, Tian X, Huang Y, Zhao J, **Lai L**. Skint8, a Novel B7 Family-Related Molecule, Negatively Regulates T Cell Responses. *J Immunol*. 2019 Jul 15;203(2):400-407.
32. Su M, Lin Y, Cui C, Tian X, **Lai L**. ERMAP is a B7 family-related molecule which negatively regulates T cell and macrophage responses. *Cellular & Molecular Immunology*, 2020 Jul 3. doi: 10.1038/s41423-020-0494-8. Online ahead of print.
33. Zhao K, Su M, Lin Y, He Z, **Lai L**. Transplantation of APP knock-out mouse embryonic stem cells derived thymic epithelial progenitors ameliorates Alzheimer's disease in mice. *Frontiers in Immunology*. 11 August 2020
34. Lin Y, Cui C, Su M, Tian X, Huang Y, Zhao J, **Lai L**. Skint8, a Novel B7 Family-Related Molecule, Negatively Regulates T Cell Responses. *J Immunol*. 2019 Jul 15;203(2):400-407.

35. Xin Y, Gao J, Hu R, Li H, Li Q, Han F, He Z, **Lai L**, Su M. Changes of immune parameters of T lymphocytes and macrophages in EAE mice after BM-MSCs transplantation. *Immunol Lett.* 2020 Sep;225:66-73. doi: 10.1016/j.imlet.2020.05.005. Epub 2020 Jun 13.
36. Lin Y, Cui C, Su M, Silbart LK, Liu H, Zhao J, He L, Huang Y, Xu D, Wei X, Du Q, **Lai L**. Identification of TAPBPL as a novel negative regulator of T-cell function. *EMBO Mol Med.* 2021 May 3; PubMed PMID: 33938620.
37. Liu H, Zhao J, Su M, Tian X, **Lai L**. Recombinant CD300c-Fc fusion protein attenuates collagen-induced arthritis in mice. *Rheumatology (Oxford).* 2021 May 21; PubMed PMID: 34021311.
38. Liu H, Zhao J, Lin Y, Su M, **Lai L**. Administration of anti-ERMAP antibody ameliorates Alzheimer's disease in mice. *J Neuroinflammation.* 2021 Nov 13;18(1):268. doi: 10.1186/s12974-021-02320-x.
39. Zhao J, Zhang Z, Lai, KC, and **Lai L**. Administration of recombinant FOXP1 protein attenuates Alzheimer's pathology in mice. *Brain Behav Immun.* 2023 Aug 2;113:341-352. doi: 10.1016/j.bbi.2023.07.027.
40. Huang Y, Han F, Li J, Li Y, Gao J, **Lai L**, Luo P, Su M, Hu R. BTN2A2-Ig protein inhibits the differentiation of pathogenic Th17 cells and attenuates EAE in mice. *Immunol Lett.* 2023, 260: 58-67.
41. Moses A, Bhalla P, Thompson A, **Lai L**, Coskun FS, Seroogy CM, Teresa de la Morena M, Wysocki CA, van Oers NSC. Comprehensive Phenotypic Analysis of Diverse FOXP1 Variants. *J Allergy Clin Immunol.* 2023 Jul 5:S0091-6749(23)00858-8. doi: 10.1016/j.jaci.2023.06.019. Online ahead of print. PMID: 37419334
42. Zhang Z, Zhao J, Lai, KC, and **Lai L**. Recombinant TAPBPL protein attenuates collagen-induced arthritis in mice. *International Journal of Molecular Sciences, Int J Mol Sci.* 2023 Sep 7;24(18):13772. doi: 10.3390/ijms241813772.

Book Chapter:

Lai L. Rejuvenation of the aged thymic microenvironment by ESC-derived thymic epithelial progenitors. pp. 301-310. In "Embryonic Stem Cells-Recent Advances in Pluripotent Stem Cell-Based Regeneration Medicine", edited by Craig S. Atwood. INTECH, 2011.

Professional Societies:

Member of American Society of Immunologists
 Member of International Society for Stem Cell Research
 Member of American Society of Blood and Marrow Transplantation
 Member of American Society of Cancer Research