



Charles Kwok Fai Chan

Assistant Professor of Surgery (Plastic and Reconstructive Surgery)

Surgery - Plastic & Reconstructive Surgery

 NIH Biosketch available Online

Bio

ACADEMIC APPOINTMENTS

- Assistant Professor, Surgery - Plastic & Reconstructive Surgery
- Member, Bio-X
- Member, Cardiovascular Institute
- Member, Institute for Stem Cell Biology and Regenerative Medicine
- Member, Wu Tsai Human Performance Alliance

LINKS

- <http://med.stanford.edu/rejuvenativemedicine.html>: <http://med.stanford.edu/rejuvenativemedicine.html>

Teaching

COURSES

2021-22

- Advanced Immunology I: IMMUNOL 201 (Win)

2020-21

- Advanced Immunology I: IMMUNOL 201 (Win)

2019-20

- Advanced Immunology I: IMMUNOL 201 (Win)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Amy Fan, Sidd Menon

Postdoctoral Faculty Sponsor

Eri Takematsu, Yuting Wang, Liming Zhao

Doctoral Dissertation Advisor (AC)

Malachia Hoover

Postdoctoral Research Mentor

Eri Takematsu, Yuting Wang, Liming Zhao

Publications

PUBLICATIONS

- **Distinct skeletal stem cell types orchestrate long bone skeletogenesis.** *eLife*
Ambrosi, T. H., Sinha, R., Steininger, H. M., Hoover, M. Y., Murphy, M. P., Koepke, L. S., Wang, Y., Lu, W., Morri, M., Neff, N. F., Weissman, I. L., Longaker, M. T., Chan, et al
2021; 10
- **Aged skeletal stem cells generate an inflammatory degenerative niche.** *Nature*
Ambrosi, T. H., Marecic, O., McArdle, A., Sinha, R., Gulati, G. S., Tong, X., Wang, Y., Steininger, H. M., Hoover, M. Y., Koepke, L. S., Murphy, M. P., Sokol, J., Seo, et al
2021
- **Prrx1 Fibroblasts Represent a Pro-fibrotic Lineage in the Mouse Ventral Dermis.** *Cell reports*
Leavitt, T., Hu, M. S., Borrelli, M. R., Januszyn, M., Garcia, J. T., Ransom, R. C., Mascharak, S., desJardins-Park, H. E., Litzenburger, U. M., Walmsley, G. G., Marshall, C. D., Moore, A. L., Duoto, et al
2020; 33 (6): 108356
- **Delayed Union of a Diaphyseal Forearm Fracture Associated With Impaired Osteogenic Differentiation of Prospectively Isolated Human Skeletal Stem Cells.** *JBMR plus*
Goodnough, L. H., Ambrosi, T. H., Steininger, H., DeBaun, M. R., Abrams, G. D., McAdams, T. R., Gardner, M. J., Chan, C. K., Bishop, J. A.
2020; 4 (10): e10398
- **Human skeletal stem cell aging** *AGING-US*
Ambrosi, T. H., Goodnough, L., Chan, C. F.
2020; 12 (17): 16669–71
- **Human skeletal stem cell aging.** *Aging*
Ambrosi, T. H., Goodnough, L. H., Chan, C. K.
2020
- **Articular cartilage regeneration by activated skeletal stem cells.** *Nature medicine*
Murphy, M. P., Koepke, L. S., Lopez, M. T., Tong, X., Ambrosi, T. H., Gulati, G. S., Marecic, O., Wang, Y., Ransom, R. C., Hoover, M. Y., Steininger, H., Zhao, L., Walkiewicz, et al
2020
- **Geriatric fragility fractures are associated with a human skeletal stem cell defect.** *Aging cell*
Ambrosi, T. H., Goodnough, L. H., Steininger, H. M., Hoover, M. Y., Kim, E., Koepke, L. S., Marecic, O., Zhao, L., Seita, J., Bishop, J. A., Gardner, M. J., Chan, C. K.
2020; e13164
- **Therapeutic modulation of phagocytosis in glioblastoma can activate both innate and adaptive antitumour immunity.** *Nature communications*
von Roemeling, C. A., Wang, Y., Qie, Y., Yuan, H., Zhao, H., Liu, X., Yang, Z., Yang, M., Deng, W., Bruno, K. A., Chan, C. K., Lee, A. S., Rosenfeld, et al
2020; 11 (1): 1508
- **Expansion of Bone Precursors through Jun as a Novel Treatment for Osteoporosis-Associated Fractures.** *Stem cell reports*
Lerbs, T., Cui, L., Muscat, C., Saleem, A., van Neste, C., Domizi, P., Chan, C., Wernig, G.
2020
- **A single-cell transcriptomic atlas characterizes ageing tissues in the mouse.** *Nature*
2020
- **Ageing hallmarks exhibit organ-specific temporal signatures.** *Nature*
Schaum, N. n., Lehallier, B. n., Hahn, O. n., Pálóvics, R. n., Hosseinzadeh, S. n., Lee, S. E., Sit, R. n., Lee, D. P., Losada, P. M., Zardeneta, M. E., Fehlmann, T. n., Webber, J. T., McGeever, et al
2020
- **A Brain-Dependent Osteogenic Factor Dramatically Enhances the Capacity of Skeletal Stem Cells to form Bone in Female Mice**
Herber, C., Ventura, P., Villeda, S., Ingraham, H., Ambrosi, T., Chan, C., Lane, N.

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- **A Brain-Dependent Osteogenic Factor Dramatically Enhances the Capacity of Skeletal Stem Cells to form Bone in Female Mice**
Herber, C., Ventura, P., Villeda, S., Ingraham, H., Ambrosi, T., Chan, C., Lane, N.
WILEY.2019: 57
- **Role of the Skeletal Stem Cell in Achilles Tendon to Bone Interface Healing**
Titan, A. L., Jones, R., Salhotra, A., Robertson, K. S., Foster, D., Menon, S., Murphy, M., Lucero, G. V., Chan, C. K., Longaker, M. T.
ELSEVIER SCIENCE INC.2019: S228–S229
- **A Revised Perspective of Skeletal Stem Cell Biology**. *Frontiers in cell and developmental biology*
Ambrosi, T. H., Longaker, M. T., Chan, C. K.
2019; 7: 189
- **A Revised Perspective of Skeletal Stem Cell Biology** *FRONTIERS IN CELL AND DEVELOPMENTAL BIOLOGY*
Ambrosi, T. H., Longaker, M. T., Chan, C. F.
2019; 7
- **THERAPEUTIC MODULATION OF THE PHAGOCYtic AXIS SPARKS ANTI-TUMOR CD8 T CELL RESPONSES IN GLIOBLASTOMA**
von Roemeling, C., Qie, Y., Jiang, W., Chen, Y., Shih, K., Liu, X., Knight, J., Tian, R., Chan, C., Kim, B.
OXFORD UNIV PRESS INC.2018: 124
- **Mechanoresponsive stem cells acquire neural crest fate in jaw regeneration**. *Nature*
Ransom, R. C., Carter, A. C., Salhotra, A., Leavitt, T., Marecic, O., Murphy, M. P., Lopez, M. L., Wei, Y., Marshall, C. D., Shen, E. Z., Jones, R. E., Sharir, A., Klein, et al
2018
- **Method of Isolating and Transplanting the Hematopoietic Stem Cell with Its Microenvironment Which Improves Functional Hematopoietic Engraftment**
Borrelli, M. R., Lopez, M., Gulati, G., Murphy, M. P., Sinha, R., Longaker, M. T., Weissman, I. L., Newman, A. M., Chan, C. K., Sokol, J.
ELSEVIER SCIENCE INC.2018: E224
- **Translational Approach Using Trimodal Manipulation of Resident Skeletal Stem Cells for Articular Cartilage Repair**
Murphy, M. P., Koepke, L. S., Lopez, M., Ransom, R. C., Brewer, R. E., Borrelli, M. R., Marecic, O., Chan, C. F., Longaker, M. T.
ELSEVIER SCIENCE INC.2018: S213–S214
- **Identification of the Human Skeletal Stem Cell**. *Cell*
Chan, C. K., Gulati, G. S., Sinha, R., Tompkins, J. V., Lopez, M., Carter, A. C., Ransom, R. C., Reinisch, A., Wearda, T., Murphy, M., Brewer, R. E., Koepke, L. S., Marecic, et al
2018; 175 (1): 43
- **Isolation and functional assessment of mouse skeletal stem cell lineage** *NATURE PROTOCOLS*
Gulati, G. S., Murphy, M. P., Marecic, O., Lopez, M., Brewer, R. E., Koepke, L. S., Manjunath, A., Ransom, R. C., Salhotra, A., Weissman, I. L., Longaker, M. T., Chan, C. F.
2018; 13 (6): 1294–1309
- **Improving immune-vascular crosstalk for cancer immunotherapy** *NATURE REVIEWS IMMUNOLOGY*
Huang, Y., Kim, B. S., Chan, C. K., Hahn, S. M., Weissman, I. L., Jiang, W.
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- **Prolonged survival of transplanted stem cells after ischaemic injury via the slow release of pro-survival peptides from a collagen matrix**. *Nature biomedical engineering*
Lee, A. S., Inayathullah, M., Lijkwan, M. A., Zhao, X., Sun, W., Park, S., Hong, W. X., Parekh, M. B., Malkovskiy, A. V., Lau, E., Qin, X., Pothineni, V. R., Sanchez-Freire, et al
2018; 2 (2): 104–113
- **Where Hematopoietic Stem Cells Live: The Bone Marrow Niche** *ANTIOXIDANTS & REDOX SIGNALING*
Szade, K., Gulati, G. S., Chan, C. F., Kao, K. S., Miyanishi, M., Marjon, K. D., Sinha, R., George, B. M., Chen, J. Y., Weissman, I. L.
2018
- **Prrx1 Labels the Fibrogenic Fibroblast in the Ventral Dermis**
Hu, M., Leavitt, T., Garcia, J., Ransom, R., Litzenburger, U., Walmsley, G., Marshall, C., Moore, A., Mascharak, S., Chan, C., Wan, D., Lorenz, P., Chang, et al

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- **Single-cell transcriptomics of 20 mouse organs creates a Tabula Muris.** *Nature*
2018; 562 (7727): 367–72
- **Prolonged survival of transplanted stem cells after ischaemic injury via the slow release of pro-survival peptides from a collagen matrix** *Nature Biomedical Engineering*
Lee, A. S., Inayathullah, ., Lijkwan, . A., Zhao, X., Sun, W., Park, S., Hong, W. X., Parekh, M. B., Malkovskiy, A. V., Lau, E., Qin, X., Pothineni, . R., et al
2018; 2 (2): 104–13
- **Lessons from immuno-oncology: a new era for cancer nanomedicine?** *NATURE REVIEWS DRUG DISCOVERY*
Jiang, W., Yuan, H., Chan, C. K., von Roemeling, C. A., Yan, Z., Weissman, I. L., Kim, B. S.
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- **Discussion: Regeneration of Vascularized Corticocancellous Bone and Diploic Space Using Muscle- Derived Stem Cells: A Translational Biologic Alternative for Healing Critical Bone Defects** *PLASTIC AND RECONSTRUCTIVE SURGERY*
Murphy, M. P., Chan, C. K., Longaker, M. T.
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- **Fibroblasts become fat to reduce scarring.** *Science*
Chan, C. K., Longaker, M. T.
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- **Breaking Down the Barriers to Precision Cancer Nanomedicine** *TRENDS IN BIOTECHNOLOGY*
von Roemeling, C., Jian, W., Chan, C. K., Weissman, I. L., Kim, B. Y.
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- **Pharmacological rescue of diabetic skeletal stem cell niches.** *Science translational medicine*
Tevlin, R., Seo, E. Y., Marecic, O., McArdle, A., Tong, X., Zimdahl, B., Malkovskiy, A., Sinha, R., Gulati, G., Li, X., Wearda, T., Morganti, R., Lopez, et al
2017; 9 (372)
- **Human Adipose-Derived Stromal Cell Isolation Methods and Use in Osteogenic and Adipogenic In Vivo Applications.** *Current protocols in stem cell biology*
Brett, E., Tevlin, R., McArdle, A., Seo, E. Y., Chan, C. K., Wan, D. C., Longaker, M. T.
2017; 43
- **The Role of Skeletal Stem Cells in the Reconstruction of Bone Defects.** *The Journal of craniofacial surgery*
Murphy, M. P., Irizarry, D. n., Lopez, M. n., Moore, A. L., Ransom, R. C., Longaker, M. T., Wan, D. C., Chan, C. K.
2017; 28 (5): 1136–41
- **External Beam Radiation Therapy for the Treatment of Human Pluripotent Stem Cell-Derived Teratomas.** *Stem cells (Dayton, Ohio)*
Lee, A. S., Tang, C. n., Hong, W. X., Park, S. n., Bazalova, M. n., Nelson, G. n., Sanchez-Freire, V. n., Bakerman, I. n., Zhang, W. n., Neofytou, E. n., Connolly, A. J., Chan, C. K., Graves, et al
2017
- **Lectins bring benefits to bones** *ELIFE*
Chan, C. F., Ransom, R. C., Longaker, M. T.
2016; 5
- **A Novel Method of Human Adipose-Derived Stem Cell Isolation with Resultant Increased Cell Yield** *PLASTIC AND RECONSTRUCTIVE SURGERY*
Tevlin, R., McArdle, A., Brett, E., Chung, M. T., Paik, K., Seo, E. Y., Walmsley, G. G., Duldulao, C. R., Atashroo, D., Zielins, E., Vistnes, S., Chan, C. K., Wan, et al
2016; 138 (6): 983E-996E
- **Immune Priming of the Tumor Microenvironment by Radiation** *TRENDS IN CANCER*
Jiang, W., Chan, C. K., Weissman, I. L., Kim, B. S., Hahn, S. M.
2016; 2 (11): 638–45
- **Enrichment of Adipose-Derived Stromal Cells for BMPRI1 Facilitates Enhanced Adipogenesis** *TISSUE ENGINEERING PART A*
Zielins, E. R., Paik, K., Ransom, R. C., Brett, E. A., Blackshear, C. P., Luan, A., Walmsley, G. G., Atashroo, D. A., Senarath-Yapa, K., Momeni, A., Rennert, R., Sorkin, M., Seo, et al
2016; 22 (3-4): 214-221

- **Local and Circulating Endothelial Cells Undergo Endothelial to Mesenchymal Transition (EndMT) in Response to Musculoskeletal Injury.** *Scientific reports*
Agarwal, S., Loder, S., Cholok, D., Peterson, J., Li, J., Fireman, D., Breuler, C., Hsieh, H. S., Ranganathan, K., Hwang, C., Drake, J., Li, S., Chan, et al
2016; 6: 32514-?
- **Identification and characterization of an injury-induced skeletal progenitor** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Marecic, O., Tevlin, R., McArdle, A., Seo, E. Y., Wearda, T., Duldulao, C., Walmsley, G. G., Nguyen, A., Weissman, I. L., Chan, C. K., Longaker, M. T.
2015; 112 (32): 9920-9925
- **Assessment of the Radiation Effects of Cardiac CT Angiography Using Protein and Genetic Biomarkers** *JACC-CARDIOVASCULAR IMAGING*
Nguyen, P. K., Lee, W. H., Li, Y. F., Hong, W. X., Hu, S., Chan, C., Liang, G., Nguyen, I., Ong, S., Churko, J., Wang, J., Altman, R. B., Fleischmann, et al
2015; 8 (8): 873-884
- **Assessment of the Radiation Effects of Cardiac CT Angiography Using Protein and Genetic Biomarkers.** *JACC. Cardiovascular imaging*
Nguyen, P. K., Lee, W. H., Li, Y. F., Hong, W. X., Hu, S., Chan, C., Liang, G., Nguyen, I., Ong, S., Churko, J., Wang, J., Altman, R. B., Fleischmann, et al
2015; 8 (8): 873-884
- **The role and regulation of osteoclasts in normal bone homeostasis and in response to injury.** *Plastic and reconstructive surgery*
McArdle, A., Marecic, O., Tevlin, R., Walmsley, G. G., Chan, C. K., Longaker, M. T., Wan, D. C.
2015; 135 (3): 808-816
- **Identification and specification of the mouse skeletal stem cell.** *Cell*
Chan, C. K., Seo, E. Y., Chen, J. Y., Lo, D., McArdle, A., Sinha, R., Tevlin, R., Seita, J., Vincent-Tompkins, J., Wearda, T., Lu, W., Senarath-Yapa, K., Chung, et al
2015; 160 (1-2): 285-298
- **Epigenetic and in vivo comparison of diverse MSC sources reveals an endochondral signature for human hematopoietic niche formation.** *Blood*
Reinisch, A., Etchart, N., Thomas, D., Hofmann, N. A., Fruehwirth, M., Sinha, S., Chan, C. K., Senarath-Yapa, K., Seo, E., Wearda, T., Hartwig, U. F., Beham-Schmid, C., Trajanoski, et al
2015; 125 (2): 249-260
- **Positive Selection for Bone Morphogenetic Protein Receptor Type-IB Promotes Differentiation and Specification of Human Adipose-Derived Stromal Cells Toward an Osteogenic Lineage** *TISSUE ENGINEERING PART A*
McArdle, A., Chung, M. T., Paik, K. J., Duldulao, C., Chan, C., Rennert, R., Walmsley, G. G., Senarath-Yapa, K., Hu, M., Seo, E., Lee, M., Wan, D. C., Longaker, et al
2014; 20 (21-22): 3031-3040
- **Positive selection for bone morphogenetic protein receptor type-IB promotes differentiation and specification of human adipose-derived stromal cells toward an osteogenic lineage.** *Tissue engineering. Part A*
McArdle, A., Chung, M. T., Paik, K. J., Duldulao, C., Chan, C., Rennert, R., Walmsley, G. G., Senarath-Yapa, K., Hu, M., Seo, E., Lee, M., Wan, D. C., Longaker, et al
2014; 20 (21-22): 3031-3040
- **Abstract 161: identification of cell-intrinsic mechanisms and differentially regulated genetic pathways responsible for the age-related functional decline in aged skeletal stem cells.** *Plastic and reconstructive surgery*
McArdle, A., Chan, C., Seita, J., Senarath-Yapa, K., Hu, M., Walmsley, G. G., Zielins, E., Atashroo, D., Tevlin, R., Weissman, I., Longaker, M. T.
2014; 133 (3): 178-?
- **Osteoclast derivation from mouse bone marrow.** *Journal of visualized experiments : JoVE*
Tevlin, R., McArdle, A., Chan, C. K., Pluvillage, J., Walmsley, G. G., Wearda, T., Marecic, O., Hu, M. S., Paik, K. J., Senarath-Yapa, K., Atashroo, D. A., Zielins, E. R., Wan, et al
2014
- **Osteoclast derivation from mouse bone marrow.** *Journal of visualized experiments : JoVE*
Tevlin, R., McArdle, A., Chan, C. K., Pluvillage, J., Walmsley, G. G., Wearda, T., Marecic, O., Hu, M. S., Paik, K. J., Senarath-Yapa, K., Atashroo, D. A., Zielins, E. R., Wan, et al
2014
- **BLT-humanized C57BL/6 Rag2(-/-)gamma(-/-)(c)CD47(-/-) mice are resistant to GVHD and develop B- and T-cell immunity to HIV infection** *BLOOD*

- Lavender, K. J., Pang, W. W., Messer, R. J., Duley, A. K., Race, B., Phillips, K., Scott, D., Peterson, K. E., Chan, C. K., Dittmer, U., Dudek, T., Allen, T. M., Weissman, et al
2013; 122 (25): 4013-4020
- **Clonal precursor of bone, cartilage, and hematopoietic niche stromal cells** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Chan, C. K., Lindau, P., Jiang, W., Chen, J. Y., Zhang, L. F., Chen, C., Seita, J., Sahoo, D., Kim, J., Lee, A., Park, S., Nag, D., Gong, et al
2013; 110 (31): 12643-12648
 - **Do pluripotent stem cells exist in adult mice as very small embryonic stem cells?** *Stem cell reports*
Miyaniishi, M., Mori, Y., Seita, J., Chen, J. Y., Karten, S., Chan, C. K., Nakauchi, H., Weissman, I. L.
2013; 1 (2): 198-208
 - **Do pluripotent stem cells exist in adult mice as very small embryonic stem cells?** *Stem cell reports*
Miyaniishi, M., Mori, Y., Seita, J., Chen, J. Y., Karten, S., Chan, C. K., Nakauchi, H., Weissman, I. L.
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 - **In vivo directed differentiation of pluripotent stem cells for skeletal regeneration** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Levi, B., Hyun, J. S., Montoro, D. T., Lo, D. D., Chan, C. K., Hu, S., Sun, N., Lee, M., Grova, M., Connolly, A. J., Wu, J. C., Gurtner, G. C., Weissman, et al
2012; 109 (50): 20379-20384
 - **VHL loss in renal cell carcinoma leads to up-regulation of CUB domain-containing protein 1 to stimulate PKC delta-driven migration** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Razorenova, O. V., Finger, E. C., Colavitti, R., Chernikova, S. B., Boiko, A. D., Chan, C. K., Krieg, A., Bedogni, B., LaGory, E., Weissman, I. L., Broome-Powell, M., Giaccia, A. J.
2011; 108 (5): 1931-1936
 - **Anti-CD47 Antibody Synergizes with Rituximab to Promote Phagocytosis and Eradicate Non-Hodgkin Lymphoma** *CELL*
Chao, M. P., Alizadeh, A. A., Tang, C., Myklebust, J. H., Varghese, B., Gill, S., Jan, M., Cha, A. C., Chan, C. K., Tan, B. T., Park, C. Y., Zhao, F., Kohrt, et al
2010; 142 (5): 699-713
 - **Endochondral ossification is required for haematopoietic stem-cell niche formation** *NATURE*
Chan, C. K., Chen, C., Luppen, C. A., Kim, J., DeBoer, A. T., Wei, K., Helms, J. A., Kuo, C. J., Kraft, D. L., Weissman, I. L.
2009; 457 (7228): 490-U9
 - **Elucidation of the phenotypic, functional, and molecular topography of a myeloerythroid progenitor cell hierarchy** *CELL STEM CELL*
Pronk, C. J., Rossi, D. J., Mansson, R., Attema, J. L., Norddahl, G. L., Chan, C. K., Sigvardsson, M., Weissman, I. L., Bryder, D.
2007; 1 (4): 428-442