BIOGRAPHICAL SKETCH

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NAME:Bo Han

eRA COMMONS USER NAME (credential, e.g., agency login): bohanusc

POSITION TITLE: Associate Professor of Research Surgery and Biomedical Engineering

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Nanjing University, China	B.S.	07/87	Biochemistry
Sichuan University, China	M.S.	07/90	Biomaterial
University of Southern California	Ph.D.	07/98	Biochem & Mol Bio
USC Dept of Surgery, Los Angeles, CA	Postdoc.	07/2000	Tissue Engineering

A. Personal Statement

I have been independent investigator since 2002. My area of interest and expertise has always in understanding the cellular functions in the tissue context. We have created different tissue specific 3D models to cell-cell and cell matrix interaction in native ECM like environment and validated their function in animal models. Based on my understanding of tissue repair, I started to explore cancer tissue engineering to address the cancer as a wound but never heal. I have established a serials of ECM-based tumor model to l to study the impact of matrix restriction, ECM binding sites, and oxygen gradients on cancer cell proliferation, differentiation and drug responses. I have created multicellular architecture that represents physiologically relevant characteristics of the tumor and tissue of origin and has the ability to examine multiple aspects of cancer cell behaviors. The newly developed organotypic culture systems for both cancer cell and stomal cells provide a simple, rapid and high throughput platform to analyze pancreatic, prostate cancer, breast cancer cells and stromal cell interaction mimic tumor niche. We hope this toolbox will enhance drug discovery and benefit patient by testing treatment options in a quick, accurate, and cost-efficient way.

B. Positions and Honors

Positions and Employment

1987-1990 Research Assistant, Departments of Polymer Science, Division of Biomaterial, Sichuan University, Chengdu, Sichuan

1990-1992 Lecturer, Institute of Biomedical Engineering, Sichuan University

1993-1998 Research Assistant, Department of Biochemistry, University of Southern California School of Medicine
1999-2004 Research Associate, Department of Surgery, Keck School of Medicine, University of Southern California
2004- Present Assistant Professor Research Surgery, Department of Surgery, Keck School of Medicine, University of Southern California
2005-2015 Adjunct Assistant Professor, Department of Biomedical Engineering, Viterbi School of Engineering, University of Southern California
2015-Present Associate Professor, Departments of Surgery and Biomedical Engineering, University of Southern California

Other Experience, Honors, and Professional Memberships

1999-2002 Lecturer, Samra University, Los Angeles, "Biochemistry"
2002-2005 Instructor, BME410 "Introduction to Biomaterial", University of Southern California
2005-Present Instructor and Course coordinator, BME 410 "Introduction to Biomaterial and Tissue Engineering, University of Southern California

Society Membership

2011-Present Member, American Association for Cancer Research
2002-present Member, Orthopaedic Research Society
2002-present Member, American College of Nutrition
2002-present Certified Nutrition Specialist (CNS)

C. Contribution to Science

1. In vitro organoid models that reflect the physiological environments are the key to study tissue specific cell functions. I have setup a few in vitro test systems for high throughput test of impact factors on pathway related cell activity. After validation in the in vivo assay, some methods have been adapted as industrial standards.
    a. Fang, J, Yang, Z, Charisse Tayag, ShihJye Tan, Nimni, ME, **Han, B*,** 3D bioengineered tumor based on remodelable hydrogel, *PLoS One*. 2014 Aug 18;9(8). PMID: 25133673
    b. Josephine Y. Fang, Shih-Jye Tan, Yi-Chen Wu, Zhi Yang, Ba X Hoang, and **Bo Han***, From Competency to dormancy: a 3D model to study cancer cells and drug responsiveness**,** *Journal of Translational Medicine*, 2016, **14**:38
    c. **Han B**. Screening miRNA for Functional Significance by 3D Cell Culture System. Methods Mol Biol. 2018;1733:193-201. PubMed PMID: 29435934.
    d. Tian M, **Han B,** Tan H, You C, Preparation and characterization of galactosylated alginate-chitosan oligomer microcapsule for hepatocytes microencapsulation. Carbohydr Polym, 2014, 112: 502-11. PMID 25129774
    e. Chun J, Tuan TL, **Han B**, Vangsness CT, Nimni ME. Cultures of ligament fibroblasts in fibrin matrix gel, *Connect Tissue Res*. 2003;44(2):81-7. PMID:12745674
2. Cancer microenvironment impacts on cancer cell metabolism, progression and their responses to drug.
    a. Hoang BX**, Han B**, Shaw DG, Nimni M. Zinc as a possible preventive and therapeutic agent in pancreatic, prostate, and breast cancer. Eur J Cancer Prev. 2016 25(5):457-61, PMID: 26317381

b. Hoang BX, Shaw DG, **Han B**, Fang JY, Nimni M. Acidosis and Formaldehyde Secretion as a Possible Pathway of Cancer Pain and Options for Improved Cancer Pain Control. J Pain Palliat Care Pharmacother. 29(3):276-80. Epub 2015 Sep 14. PMID: 26368037
c. Sheng-Fang Su, Y.-W.C., Claudia Andreu-Vieyra , Amy Lee , Josephine Fang , Zhi Yang , **Bo Han**, Gangning Liang, MiR-30d, miR-181a, and miR-199a-5p cooperatively suppress the ER chaperone and signaling regulator GRP78 in cancer, Oncogene, (2013) 32, 4694–4701. PMID:23085757
d. Marcel E. Nimni, **Bo Han** and Fabiola Cordoba, ARE WE GETTING ENOUGH SULFUR IN OUR DIET? ***J Nutrition and Metabolism***, 2007, **4**:24 doi:10.1186/1743-7075-4-24, PMID:17986345
e. Scarton L, Yoon S, Oh S, Agyare E, Trevino J, **Han B**, Lee E, Setiawan VW, Permuth JB, Schmittgen TD, Odedina FG, Wilkie DJ, Pancreatic Cancer Related Health Disparities: A Commentary, Cancers 10(7) 2019

3. Proper scaffolding material provide not only guiding cues for residing cells, but also provide structure support for the wound healing and repair tissue.

a. Franciozi CS, Vangsness CT, Tibone JE, Martinez JC, Roger D, Chou TC, Tai YC, Brant R, Wu L, Abdalla RJ**, Han B**, Evseenk D, Humanyun M, Parylene Scaffold for Cartilage Lesion, ***Biomed Microdevices***, 2017 19:26
b. Tan SJ, Liang G, Fang JY, Yang Z, Wu Y, **Han B**, Epigenetic Reprogramming of Cell-Based Therapy through the Manipulation of Hydrogel Stiffness, Scientific Report, Accepted, 2015
c. Tan SJ,. Fang JY, Yang Z, Nimni ME, **Han B**, The Synergetic Effect of Hydrogel Stiffness and Growth Factor on Osteogenic-Differentiation, Biomaterials**,** 2014 Jul;35(20):5294-306.Epub 2014 Apr 3. PMID: 24703716
d. Fang J , Yang Z, Tan S, Tayag C, Nimni ME, Urata M, **Han B**, Injectable Gel Graft for Bone Defect Repair, Regenerative Medicine 2014 Jan;9(1):41-51
e. Tian M, Yang Z, Kuwahara K, Nimni ME, Wan C, **Han B**, Delivery of demineralized bone matrix (DBM) powder using a thermogelling chitosan carrier, Acta Materialia, 2012, 8(2):753-62. PMID:22079781

4. Select the proper animal models and apply them for validation of in vitro finding is the key for success of innovation idea. I have extensive experience of using animal models to elucidate environmental cues in cartilage and bone tissue regeneration.

a. Yeh TT, Wen ZH, Lee HS, Lee CH, Yang Z, Jean YH, Wu SS, Nimni ME, **Han B**, Intra-articular injection of collagenase induced experimental osteoarthritis of the lumbar facet joint in rats. Eur Spine J. 2008 May;17(5):734-42, PMID:18224353
b. Yeh TT; Wu SS, Lee CH, Yang Z, Nimni ME, **Han B**, The Short-Term Therapeutic Effect of Recombinant Human Bone Morphogenetic Protein-2 on Collagenase Induced Lumbar Facet Joint Osteoarthritis in Rats, Osteoarthritis and Cartilage, 2007, Dec;15(12):1357-66. Epub 2007 Jun 22, PMID:17590359
c. **Han B***, Yang Z, Fang J, Kuwahara K, Nimni, M, Thanasukarn J, Tayag C, The Effect of Heparin Binding Proteins in Platelet Releasate on Bone Formation, Tissue Engineering Part A,. 2014 Apr;20(7-8):.PMID: 24295446

d. Franciozi CEDS, Vangsness CT Jr, Tibone JE, Martinez JC, Rodger D, Chou TC, Tai YC, Brant R, Wu L, Abdalla RJ, **Han B**, Evseenko D, Humayun M. Parylene scaffold for cartilage lesion. Biomed Microdevices. 2017 Jun;19(2):26. doi: 10.1007/s10544-017-0170-7. PubMed PMID: 28391436.

5. Develop differentiation protocols for stem cells and progenitor cells

a. McIntyre JA, Jones IA, **Han B, Vangsness CT** Jr. Intra-articular Mesenchymal Stem Cell Therapy for the Human Joint: A Systematic Review. Am J Sports Med. 2017 Nov 1:363546517735844. doi: 10.1177/0363546517735844. [PubMed PMID: 29099618.

b. Andrades JA, **Han B,** Nimni ME, Ertl DC, Simpkins RJ, Arrabal MP, Becerra J.A Modified rhTGF-beta1 and rhBMP-2 Are Effective in Initiating a Chondro-Osseous Differentiation Pathway in Bone Marrow Cells Cultured In Vitro. *Connect Tissue Res.* 2003;44(3-4):188-97. PMID:14504040

c. Hall F, **Han B**, Kundu R K, Lee A, Nimni M, and Gordon EM, (2001) Phenotypic differentiation of TGF-β-responsive pluripotent premesenchymal prehematopoietic progenitor (P4 stem) cells from murine bone marrow, J hematotherapy & Stem Cell Res. 10:261-271. PMID:11359673

d. J.A. Andrades, **B. Han**, J. Becerra, N. Sorgente, F.L. Hall, M.E. Nimni (1999) A recombinant human TGF-β1 fusion protein with a collagen-binding domain promote migration, growth, and differentiation of bone marrow mesenchymal cells *Exprt Cell Res.* 250:485-98. PMID:10413602

e. Gordon E.M. Skotzko M, Kundu R.K., **Han B**., Nimni M. E., Anderson W.F., Hall F. L. (1997) Capture and expansion of bone marrow-derived mesenchymal progenitor cells with a transforming growth factor beta1-von Willebrand's factor fusion protein for retrovirus-mediated delivery of coagulation factor IX. *Human Gene Therapy*, 8:1385-

6. **Complete List of Published Work in My Bibliography:**
https://www.ncbi.nlm.nih.gov/myncbi/browse/collection/48110466/?sort=date&direction=ascending

D. Research Support
Ongoing Research Support

1R21AG053746-01A1 (PI: Han) 07/01/2018 – 06/30/2020
NIH/NIA
Epigenetic Approach for Prevention and Treatment of age-related Osteoarthritis
The major goal of this project is to improve cartilage regeneration by promoting in situ cell reprogramming through a minimally invasive approach.
Role: PI

1U54 CA233465-01 (PI: Carpten) 09/1/2018 – 08/30/2021
NIH
Florida-California Cancer Research, Education and Engagement (CaRE2) Health Equity Center
Role: PI of Project 2
The major goal of this project is to investigate the use of 3D culture system to characterize and assess in vitro activity of newly developed drug GemEnps in patient-derived primary cancer cells (2D and 3D spheroid cultures) from surgically resected AA, Hispanics and White PCa patients.