

**BIOGRAPHICAL SKETCH**

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NAME Xiaoyuan Chen, PhD	POSITION TITLE Associate Professor		
eRA COMMONS USER NAME CHEN.XIAOYUAN			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
Nanjing University, Nanjing, China	B.Sc.	09/89-07/93	Chemistry
Nanjing University, Nanjing, China	M.Sc.	09/93-07/96	Chemistry
University of Idaho, Moscow, ID	Ph.D.	08/96-08/99	Chemistry
Syracuse University, Syracuse, NY	Postdoc	08/99-10/00	Chemistry
Washington University, St. Louis, MO	Postdoc	11/00-09/01	Radiology

**A. POSTIONS AND EMPLOYMENT:**

2001-2002 Radio-organic and peptide chemist, SynPep, Inc., Dublin, CA.  
 2002-2004 Assistant Professor, Department of Radiology, University of Southern California  
 2004-2007 Assistant Professor, Department of Radiology, Stanford University.  
 2008-present Associate Professor, Department of Radiology, Stanford University.

**HONORS AND MEMBERSHIPS:**

2008 First place award in the Molecular Imaging Abstract track for abstract titled "Trafficking the fate of mesenchymal stem cells in vivo" from the SNM's Molecular Imaging Center of Excellence (56th SNM annual meeting)  
 2006-2008 Best Basic Science Award @ 54th, 55th, and 56th SNM annual meetings  
 2004, 2008 J Nucl Med cover features 2004 (issue #7) and 2006 (issue #1)  
 2005 OCRP Pilot Award, Department of Defense  
 2004, 2007 BCRP IDEA Award, Department of Defense  
 2003 PCRP New Investigator Award, Department of Defense  
 2003, 2006 BCRP Concept Award, Department of Defense  
 2003 Research Award, American Lung Association of California  
 2003 Research Award, Robert E. and Mary R. Wright Foundation  
 2003 Pilot Research Grant, Society of Nuclear Medicine Education and Research Foundation  
 2002 Institutional Research Grant, American Cancer Society  
 Members: American Chemical Society (since 1996); Royal Society of Chemistry (Since 1999); Society of Nuclear Medicine (since 2001); Society for Molecular Imaging (since 2002); Academy of Molecular Imaging (since 2004); AAAS (since 2004).

**Editorial board (10):**

Journal of Nuclear Medicine; European Journal of Nuclear Medicine and Molecular Imaging; Molecular Imaging and Biology; Bioconjugate Chemistry; Molecular Imaging; Recent Patents on Anti-Cancer Drug Discovery; Frontiers in Biosciences; Current Molecular Pharmacology; The Open Medical Imaging Journal; Signal Transduction Insights.

**B. SELECTED PEER-REVIEWED PUBLICATIONS** (from a full list of over 150):

- Chen X**, Conti PS, Moats RA. In Vivo Near-Infrared Fluorescence Imaging of Integrin  $\alpha\beta 3$  in Brain Tumor Xenografts. *Cancer Res* 2004;64:8009-8014.
- Chen X**, Park R, Hou Y, Tohme M, Shahinian AH, Bading JR, Conti PS. MicroPET and Autoradiographic Imaging of GRP Receptor Expression with  $^{64}\text{Cu}$ -DOTA-[Lys<sup>3</sup>]bombesin in Human Prostate Adenocarcinoma Xenografts. *J Nucl Med* 2004;45:1390-1397. **(Cover feature)**

3. **Chen X**, Gambhir SS. Significance of one-bead-one-compound combinational chemistry. *Nat Chem Biol*. 2006;2(7):351-352.
4. Cai W, Wu Y, Chen K, Tice DA, **Chen X**. In Vitro and In Vivo Characterization of <sup>64</sup>Cu-Labeled Abegrin, a Humanized Monoclonal Antibody against Integrin  $\alpha\beta 3$ . *Cancer Res*. 2006;66(19):9673-81.
5. Cai W, **Chen X**. Anti-Angiogenic Cancer Therapy Based on Integrin Antagonism. *Current Med Chem-Anti-Cancer Agents (CMC-ACA)*. 2006;6:407-428.
6. Cai W, Shin D-W, Wu Y, Cao Q, Gheysens O, Gambhir SS, Wang SX, **Chen X**. Peptide-labeled NIR quantum dot for cancer imaging in vivo. *Nano Letters*. 2006;6:669-676.
7. Cao F, Lin S, Krishnan M, Ray P, Patel M, Drukker M, Dylla SJ, Connolly AJ, **Chen X**, Weissman I, Gambhir SS, Wu JC. In Vivo Visualization of Embryonic Stem Cell Survival, Proliferation, Migration, and Ablation after Cardiac Delivery. *Circulation*. 2006;113(7):1005-14.
9. Xiong Z, Cheng Z, Zhang X, Patel M, Wu JC, Gambhir SS, **Chen X**. Imaging chemically modified adenovirus for targeting tumor expressing integrin  $\alpha\beta 3$  in living mice with positron emission tomography. *J Nucl Med*. 2006;47:130-139 (Cover feature).
10. Zhang X, Xiong Z, Wu Y, Tseng JR, Gambhir SS, **Chen X**. Quantitative PET Imaging of Tumor Integrin  $\alpha\beta 3$  Expression with [<sup>18</sup>F]FRGD2. *J Nucl Med*. 2006;47:113-121.
11. Cai W, Chen K, Mohamedali KA, Cao Q, Gambhir SS, Rosenblum MG, **Chen X**. <sup>64</sup>Cu-Labeled VEGF<sub>121</sub> for Positron Emission Tomography Imaging of VEGFR Expression. *J Nucl Med*. 2006;47(12):2048-56.
12. Cai W, Rao J, Gambhir SS, **Chen X**. Molecular Imaging in Anti-Angiogenic Drug Development. *Mol Cancer Ther*. 2006;5(11): 2624-33.
13. Veeravagu A, Hsu AR, Cai W, Hou LC, Tse VCK, **Chen X**. Vascular Endothelial Growth Factor and Vascular Endothelial Growth Factor Receptor (VEGFR) Inhibitors as Anti-Angiogenic Agents in Cancer Therapy. *Recent Patents on Anti-Cancer Drug Discovery*. 2007;2(1):59-71.
14. Hsu AR, Cai W, Veeravagu A, Chen K, Mohamedali KA, Vogel H, Hou LC, Tse V, Rosenblum MG, **Chen X**. Multimodality Molecular Imaging of Glioblastoma Growth Inhibition Using Vascular-Targeting Fusion Toxin VEGF121/rGel. *J Nucl Med*. 2007;48(3):445-454.
15. Wu Z, Li Z-B, Cai W, He L, Chin FT, Li F, **Chen X**. microPET Imaging of Tumor  $\alpha\beta 3$  Integrin Expression Using 18F-labeled PEGylated Tetrameric RGD Peptide (<sup>18</sup>F-FPRGD4). *J Nucl Med*, 2007;48:1536-44.
16. Cao Q, Cai W, Li Z-B, Chen K, He L, Li H-C, Hui M, **Chen X**. PET of Acute and Chronic Inflammation in Living Mice. *Eur J Nucl Med Mol Imaging*, 2007;34(11):1832-42.
17. Li Z-B, Cai W, Cao Q, Chen K, Wu Z, He L, **Chen X**. <sup>64</sup>Cu-Labeled Tetrameric and Octameric RGD Peptides for MicroPET Imaging of Tumor  $\alpha\beta 3$  Integrin Expression. *J Nucl Med*, 2007;48(7):1162-1171.
18. Liu Z, Cai W, He L, Nakayama N, Sun X, **Chen X\***, Dai H\*. In Vivo Biodistribution and Highly Efficient Tumor Targeting of Carbon Nanotubes in Mice. *Nat Nanotechnol*. 2007;2(1):47-52.
19. Cai W, **Chen X**. Multimodality imaging of vascular endothelial growth factor and vascular endothelial growth factor receptor expression. *Front Biosci*. 2007;12:4267-4279.
20. Wang H, Cai W, Chen K, Li Z-B, He L, **Chen X**. A new PET tracer specific for vascular endothelial growth factor receptor 2. *Eur J Nucl Med Mol Imaging*, 2007;34(12):2001-2010.
21. Li ZB, Wu Z, Chen K, Chin FT, **Chen X**. Click Chemistry for 18F-Labeling of RGD Peptides and microPET Imaging of Tumor Integrin  $\alpha\beta 3$  Expression. *Bioconj Chem* 2007;18(6):1987-1994.
22. Cai W, **Chen X**. Nanoplatfoms for Targeted Molecular Imaging in Living Subjects. *Small* 2007;3:1840-54.
23. Cai W, Chen K, Li Z-B, Gambhir SS, **Chen X**. Dual Functional Quantum Dot-Based Probe for Near-Infrared Fluorescence and Positron Emission Tomography Imaging of Cancer. *J Nucl Med* 2007;48:1862-70.
24. Iagaru A, **Chen X**, Gambhir SS. Molecular Imaging Can Accelerate Anti-Angiogenic Drug Development and Testing. *Nat Clin Pract Oncol*, 2007;4:556-7.
25. Willman JK, Paulmurugan R, Chen K, Gheysens O, Rodriguez-Porcel M, Lutz AM, Chen IY, **Chen X**, Gambhir SS. Ultrasonic Imaging of Tumor Angiogenesis with Contrast Microbubbles Targeted to Vascular Endothelial Growth Factor Type 2 Receptor. *Radiology*, 2008;246:508-518.
26. Willmann JK, Chen K, Wang H, Paulmurugan P, Rollins M, Cai W, Wang D, Chen IY, **Chen X**, Gambhir SS
27. Monitoring of Therapeutic Angiogenesis in Murine Hindlimb Ischemia using <sup>64</sup>Cu-labeled Vascular Endothelial Growth Factor-121 Positron Emission Tomography. *Circulation*, 2008;117:915-922.
28. Li Z-B, Chen K, **Chen X**. <sup>68</sup>Ga-labeled Multimeric RGD Peptides for microPET Imaging of  $\alpha\beta 3$  Integrin Expression. *Eur J Nucl Med Mol Imaging*, 2008;35:1100-8.

Principal Investigator/Program Director (Last, First, Middle):

29. Liu Z, Davis C, Cai W, He L, **Chen X**, Dai H. Circulation and Long-Term Fate of Functionalized, Biocompatible Single-Walled Carbon Nanotubes in Mice Probed by Raman Spectroscopy. PNAS, 2008;105:1410-1415.
30. Cai W, **Chen X**. Preparation of peptide conjugated quantum dots for targeted cancer imaging. Nat Protocol 2008;3:89-96.
31. Cai W, Niu G, **Chen X**. Molecular Imaging of the HER-Kinase Axis in cancer. Eur J Nucl Med Mol Imaging, 2008;35(1):186-208.
32. Rodriguez-Porcel M, Cai W, Gheysens O, Chen I, Chen K, He L, Willman J, Wu JC, **Chen X**, Gambhir SS. Imaging of VEGF Receptor in a Rat Myocardial Infarction Model using Positron Emission Tomography. J Nucl Med, 2008;49:667-73.
33. Cai W, **Chen X**. Multimodality Molecular Imaging of Tumor Angiogenesis. J Nucl Med, 2008; 49(Suppl 2):113S-28S.

## C. RESEARCH SUPPORT:

### Ongoing Research Support

R01 CA CA135109                      Chen, Dai (MPI)    5/12/08 – 4/30/13  
NCI/NIH

#### **Carbon Nanotubes as Multi-functional Spectroscopic Markers and Delivery Agents**

The goal of this project is to apply water-soluble and biocompatible single-walled carbon nanotubes (SWNTs) for multimodality molecular imaging and as delivery vehicle for cancer therapy.

Role: PI

R01 CA119053                              Chen (PI)    9/18/07 – 7/31/11  
NCI

#### **Radiolabeled RGD Peptides for Breast Cancer Imaging and Therapy**

The goal of this project is to develop <sup>64</sup>Cu and <sup>86</sup>Y-labeled RGD multimers for breast cancer imaging as well as <sup>64</sup>Cu and <sup>90</sup>Y-labeled RGD multimers for breast cancer therapy.

R21 CA121842                              Chen (PI)    8/13/07 – 7/31/10  
NCI

#### **Quantum Dots for NIR Fluorescence Imaging of Tumor Angiogenesis**

The application focuses on preparing RGD-conjugated quantum dots for NIR fluorescence imaging of in vivo integrin expression.

Role: PI

BC061781                                      Chen (PI)    05/15/07 – 5/14/10  
DOD BCRP Idea

#### **Mesenchymal Stem Cell as Targeted Delivery Vehicle in Breast Cancer**

The goal of this project is to take advantage of the tumor tropism of mesenchymal stem cell to specifically deliver cytokine therapeutics for breast cancer therapy.

Role: PI

R01 CA120188                              Neamati (PI)    12/1/07 – 11/30/12  
NCI/NIH

#### **Integrin $\alpha\beta 3$ Targeted Drug Design, Delivery, and Imaging**

To develop peptide and non-peptide antagonists for integrin  $\alpha\beta 3$  targeted delivery of chemotherapeutics and to evaluate the anti-cancer treatment efficacy with non-invasive imaging techniques.

Role: Sub-contractor to USC

R01 CA115883                              Liu (PI)    03/12/07 – 02/29/12  
NCI/NIH

#### **<sup>99m</sup>Tc-Labeled Cyclic RGDfK Tetramers for Breast Cancer Imaging**

The goal of this project is to develop <sup>99m</sup>Tc-labeled tetrameric RGD peptide tracers for quantifying breast cancer integrin expression level.

Principal Investigator/Program Director (Last, First, Middle):

Role: Sub-contractor to Purdue University

1U54CA119367-01                      Gambhir (PI)                      5/1/06 – 4/30/11  
NCI

**Center for Cancer Nanotechnology Excellence at Stanford**

To develop a highly interactive and cohesive program that will produce breakthroughs towards developing and validating nanotechnologies for anti-cancer therapy response.

Role: Co-PI on RP5

P50 CA114747                      Gambhir (PI)                      07/01/05 – 06/30/10  
NCI

**Stanford ICMIC**

The goal of the program is to develop multidisciplinary multimodality molecular imaging strategies and incorporate projects that have a high potential for linking pre-clinical with clinical imaging.

Role: PI on RP4 and Specialized Resource 1 (Chemistry/Radiochemistry)

**Completed Research Support**

BC030012                      Chen (PI)                      09/01/04 – 08/31/07  
Department of Defense

**Alpha-v Integrin Targeted PET Imaging of Breast Cancer Angiogenesis and Low-Dose Metronomic Anti-Angiogenic Chemotherapy Efficacy**

To use high-resolution microPET technology to image breast cancer angiogenesis and anti-angiogenic therapy efficacy.

Role: PI

R21 CA102123                      Chen (PI)                      9/30/05 – 8/31/07  
NCI

**Imaging Alpha (v)beta(3) Integrin Expression**

The major goal of this project is to develop copper-64 labeled RGD peptide antagonists of alpha(v)beta(3) integrin for breast cancer targeting by means of positron emission tomography (PET).

Role: PI

OC050120                      Chen (PI)                      12/01/05 – 11/30/07  
Department of Defense

**Molecular Imaging of Ovarian Carcinoma Angiogenesis**

The goal of this project is to use high resolution microPET technology to image ovarian cancer integrin  $\alpha_v\beta_3$  expression *in vivo*.

Role: PI

R21 EB001785      Chen (PI)                      09/15/03 – 08/31/06  
NIBIB

**MicroPET and NIR Fluorescence Imaging Tumor Angiogenesis**

To image and quantify *in vivo* expression of the vitronectin receptor  $\alpha_v\beta_3$  integrin on human malignant tumor cells, as well as activated endothelial cells during neovascularization, by means of both radionuclide imaging (such as PET) and biomedical optical imaging (such as near-infrared (NIR) fluorescence imaging) techniques.

Role: PI

PC020544                      Chen (PI)                      04/01/03 – 03/31/06  
Department of Defense (DOD)

**Imaging Primary Prostate Cancer and Bone Metastasis**

To develop radiolabeled bombesin analogs for microPET imaging of both androgen independent and androgen dependent prostate cancer tumors in preclinical animal models.

Role: PI