CASNMMI Newsletter (January 2014)

Dear Friends

Happy Lunar New Year! Wish you all good luck and great success in the coming New Year of Horse! This is the third CASNMMI Newsletter and the first one for year 2014. CASNMMI has launched a new website: http://www.casnmmi.org. We also have member forum (http://casnmmi.org/forum/).

This issue of CASNMMI newsletter will highlight the following:

1. Introduction of new CASNMMI Board of Director (BOB) members
2. 2nd IMIS and 1st GCCPNMMI highlight
3. News items provided by the CASNMMI members

Introduction of Two New CASNMMI Board of Directors:

Chun Li, Ph.D.

Dr. Chun Li (http://faculty.mdanderson.org/Chun_Li/) is Professor of the Department of Cancer Systems Imaging, Division of Diagnostic Imaging, The University of Texas MD Anderson Cancer Center. He is also an Adjunct Professor of the PET Center, Zhejiang University; University of Texas Health Science Center at Houston, and University of Houston.

Research activities in his laboratory are primarily focused on two areas: 1) the development of targeted imaging probes for noninvasive characterization of molecular events associated with tumor progression and regression and 2) the development of novel drug-delivery systems for selective delivery of diagnostic and therapeutic agents. Molecular imaging probes used in nuclear, optical, and magnetic resonance imaging modalities are designed to enhance the sensitivity and selectivity of early tumor detection, tumor-marker profiling, and the monitoring of early treatment responses. Targeted drug delivery, on the other hand, uses nanometric drug carriers to selectively deliver anticancer agents to the tumor to maximize their therapeutic efficacy and minimize their toxic side effects to the normal tissues. The long-term goal of Chun Li Lab is to apply the "seek and treat" strategy in the development of targeted imaging/therapeutic agents that will eventually be translated to the clinic to improve the management of cancer through early tumor detection and individualized therapy.

Weibo Cai, Ph.D.

Dr. Weibo Cai (http://mi.wisc.edu/) is currently an Assistant Professor of Radiology, Medical Physics, and Biomedical Engineering at the University of Wisconsin - Madison. He received a B.S. degree in Chemistry from Nanjing University, China (1995) and a Ph.D. degree in Chemistry from the University of California, San Diego (2004). Between 2005 and 2008, Dr. Cai did his post-doctoral research at the Molecular Imaging Program at Stanford University. In February 2008, Dr. Cai joined the University of Wisconsin - Madison as a Biomedical Engineering Cluster Hire, and his research there is primarily focused on molecular imaging and nanotechnology

(http://mi.wisc.edu/). The imaging techniques routinely used in his research include positron emission tomography (PET), bioluminescence, fluorescence, magnetic resonance imaging (MRI), ultrasound, and computed tomography. Dr. Cai was recently promoted to Associate Professor with Tenure, effective in July 2014.

Dr. Cai has authored over 130 peer-reviewed articles, 17 book chapters, and > 150 conference abstracts. Dr. Cai's publications have been cited > 7,000 times with an H-index of 40. He has edited 2 books and given > 100 talks. Dr. Cai has won many awards, including the Society of Nuclear Medicine Benedict Cassen Post-Doctoral Fellowship (2006-2008), Society of Nuclear Medicine Young Professionals Committee Best Basic Science Award (2007), the Department of Defense Prostate Cancer Research Program IDEA Award (2011-2014), the European Association of Nuclear Medicine Springer Prize (2011 & 2013), European Association of Nuclear Medicine Eckert & Ziegler Abstract Award (2012), American Cancer Society Research Scholar (2013-2017), Siemens Novel Application Image of the Year (2nd Place, 2013), UW - Madison Vilas Associate Award (2014-2016), among many others. Dr. Cai has served on the Editorial Board of > 20 scientific journals, performed peer review for > 100 journals, and participated in many grant review panels (Susan G. Komen, CPRIT, Prostate Cancer Canada, many European grants, etc.). Dr. Cai is currently the Executive Editor of the American Journal of Nuclear Medicine and Molecular Imaging (http://www.ajnmmi.us), an open-access journal that was launched in 2011 and currently fully indexed in PubMed and PubMed Central.

Dr. Cai is committed to train next generation scientists and his trainees at UW - Madison have won > 20 awards, including a DOD BCRP Post-doctoral Fellowship (Yunan Yang, 2011-2014), Susan G. Komen for the Cure Post-doctoral Fellowship (Hao Hong, 2009-2011), 2012 Berson-Yalow Award from the Society of Nuclear Medicine (Hao Hong), 2012 Society of Nuclear Medicine Radiopharmaceutical Sciences Council Young Investigator Award (2nd Place, Yin Zhang), 2013 SNMMI Bradley-Alavi Student Fellowship (Yin Zhang), 2013 SNMMI Cardiovascular Council Young Investigator Award (3rd Place, Hakan Orbay), 2013 SNMMI Alavi-Mandell Award (Hao Hong), and many travel awards to scientific conferences (SNMMI, WMIC, AAPM).

Current BOD Members:

Zhen Cheng (Stanford University, Chair of BOD, President-Elect of CASNMMI)
Xiaoyuan (Shawn) Chen (NIH, President of CASNMMI)
Xiao-Feng Li (University of Louisville, Immediate-Past President of CASNMMI)
Chin Ng (University of Louisville, Past President of CASNMMI)
Yumin Zhang (Abbvie, Secretary/Treasurer of CASNMMI)

2nd IMIS Highlight

The 2nd International Molecular Imaging Summit (2nd IMIS) co-organized by the Chinese Society for Molecular Imaging (CSMI) and the Chinese American Society of Nuclear Medicine and Molecular Imaging (CASNMMI), was held in Xiamen University Xiang'an campus (October 30-November 1). Around 230 attendees from all over the world attended the conference. Drs. Ruijuan Sun, Enzhong Li, and Yuhua Peng from the National Science Foundation of China (NSFC), Prof. Jiahuai Han (Member of the Chinese Academy of Sciences), and officials from the Department of Science and Technology, Xiamen University were invited to attend the opening ceremony. The opening ceremony was presided by CASNMMI president Xiaoyuan (Shawn) Chen. Speakers at the IMIS ceremony include: Prof.

Rujuan Sun (NSFC), Prof. Guojun Zhang (Vice-President, CSMI), Prof. Gang Huang (President, CSNM), Prof. Yongxue Zhang (Tongji Medical College of Huazhong University of Science and Technology), and Prof. Jiahuai Han (Xiamen University).

The conference covered topics in nuclear medicine molecular imaging, multimodality molecular imaging and translational molecular imaging with 23 oral presentations. Dr. Belinda Seto (Deputy Director of NIBIB/NIH) and Prof. Yicheng Ni (Catholic University of Leuven KU) delivered keynote speeches. With the generous sponsorship from Dr. Chris Pak (President & CEO at Molecular Targeting Technologies, Inc.), we were able to identify 1 first prize (Chenxi Wu from PUMCH), 2 second prizes (Fei Liu from Tsinghua University and Sai Ma from FMMU), and 3 third prizes (Kai Yang from Soochow University, Xihui Gao from Fudan University, and Dan Li from Sun Yat-sen University). Mr. Ning Zhou from CAMECA sponsored the poster award (Liqin Wang from Xiamen University, Jingjing Zhang from PUMCH, Haojun Chen from the 1st Affiliated Hospital of Xiamen University, and Chang Liu from Beijing Normal University). Other sponsors include United Well, Cold Spring Biotech, Beijing Hosplink, and Simens China. More details see: http://www.csmolecularimaging.org/document/imis.pdf.

1st GCCPNMMI Highlight

The 1st Global Conference of Chinese Professionals in Nuclear Medicine and Molecular Imaging (1st GCCPNMMI), organized by the Chinese Society of Nuclear Medicine and Molecular Imaging (CSNMMI) and nuclear medicine and molecular imaging societies of various geographic locations, was successfully launched at the Xiamen International Convention and Exhibition Center. The conference was sponsored by the Reed Sinopharm Exhibitions. The CSNMMI president Prof. Gang Huang,

honorary chair of the 1st GCCPNMMI Prof. Meiying Zhang, CASNMMI immediate-past president Prof. Xiao-Feng Li, Taiwan Society of Nuclear Medicine president Prof. Wen-Sheng Huang, and Hongkong Society of Nuclear Medicine president Prof. Chiu Ming Lok, all spoke at the opening ceremony. The conference had around 500 attendees (400 from China, 43 from Taiwan, 28 from US, 15 from Hongkong, and 8 from the rest of the world).

CASNMMI Member Achievements

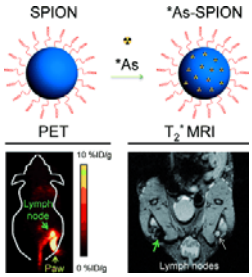
Disclaimer: The news items were provided by the CASNMMI members with limited editing. There is no bias regarding whether one news item is likely more important than the other. It is for sure that we have much more to say about the community. However, we may not know your latest greatest achievements unless you tell us!

Dr. Weibo Cai from the University of Wisconsin - Madison was promoted to Associate Professor with Tenure, effective in July 2014. In June 2013, his postdoctoral fellow Hakan Orbay won the Cardiovascular Council Young Investigator Award (3rd Place) at the SNMMI Annual Meeting in Vancouver. In August 2013, research of the Cai group was featured in 2013 DOD Prostate Cancer Research Highlights (http://cdmrp.army.mil/pcrp/research_highlights/13cai_highlight.shtml). In September 2013, his work was awarded Novel Application Image of the Year (2nd Place) by Siemens Medical Solutions USA, Inc. at the WMIC meeting. In October 2013, Prof. Cai was awarded the 2013 European Association of Nuclear Medicine Springer Prize for Best Basic Science Paper.

In January 2014, Prof. Cai was invited to serve on the Editorial Board of Theranostics (2012 Impact Factor 7.806), the Discovery Grant Panel of Prostate Cancer Canada, and the Cancer Prevention and Research Institute of Texas (CPRIT) Imaging Technology and Informatics Scientific Peer Review Panel

for another 3-Year Term. In addition, he was invited to attend the 1st Annual SNMMI Future Leaders Academy and recently received a Vilas Associate Award from UW – Madison Graduate School.

A book entitled "Engineering in Translational Medicine", Edited by Prof. Weibo Cai, was recently published by Springer. This book contains 35 chapters and covers a broad area of engineering research in translational medicine, such as cell and tissue engineering, genetic and protein engineering, nanoengineering, biomedical instrumentation, theranostics and other novel approaches.



Chen F, Ellison PA, Lewis CM, Hong H, Zhang Y, Shi S, Hernandez R, Meyerand ME, Barnhart TE, Cai W. Chelator-free synthesis of a dual-modality PET/MRI agent. Angew Chem Int Ed Engl. 2013;52(50):13319-23.
Cai group reported that Labeling of radioarsenic (*AsIII and *AsV, *=71, 72, 74, 76) at the surface of superparamagnetic iron oxide nanoparticles (SPIONs) resulted in *As-SPIONs that can be used for simultaneous PET/MRI in cancer diagnosis, lymph-node mapping, and potentially for internal radiotherapy.

Drs. **Yonglin Pu** and Bill O'Brien-Penny co-authored one of Academic Radiology's top five most downloaded articles during the first half of 2013, "Prognostic Value of Metabolic Tumor Burden from 18F-FDG PET in Surgical Patients with Non-small-cell Lung Cancer". Dr. Pu and his Chinese colleagues also published a book titled "医学影像医师执照试题精解" (Publisher: 人民军医出版社).

Dr. Guangming Lu from Jinling hospital, recently received the 2013 National Science and Technology Progress Award of China (2nd Prize) for his valuable contributions to the application of dual-energy CT in patients with cardiovascular diseases. He was also the recipient of the Chinese Medical Science and Technology Award (1st Prize) from the Chinese Medical Association. Dr. Lu is also well known for his work in molecular imaging, and has received funding through 973 program project to develop imaging-based molecular classification of breast cancer last year.

Jiangsu Key Laboratory of Molecular and Functional Imaging led by **Dr. Gaojun Teng** (Zhongda Hospital, Southeast University) had a very productive year of 2013.
Key research grants and Awards:
1. 2013-2017, Key scientific study on new technology of diagnosis and treatment for ischemic stroke based on multimodality imaging, National Key Basic Research Program of China (973 Program), No. 2013CB733800, RMB 38M.
2. 2014-2016, Medical Imaging Center, National Key Clinical Program, RMB 5M.
3. 2013-2016, Clinical center on medical imaging and interventional radiology, Jiangsu Provincial Special Program of Medical Science, No. BL2013029, RMB 13.6M.
Featured Publications:
1. Qin YL, Deng G, Li TX, Wang W, Teng GJ*. Treatment of acute type-B aortic dissection: thoracic endovascular aortic repair or medical management alone? JACC Cardiovasc Interv. 2013;6:185-91.

This study concluded that patients with type-B AAD treated with TEVAR experienced fewer late adverse events than those treated with medical management, but with no significant difference in 5-year mortality rates.

2. Peng XG, Bai YY, Fang F, Wang XY, Mao H, Teng GJ, Ju S*. Renal Lipids and Oxygenation in Diabetic Mice: Noninvasive Quantification with MR Imaging. Radiology. 2013;269(3):748-57.

This collaborative study between Drs. Shenghong Ju at Southeast University and Hui Mao at Emory University performed noninvasive CSS imaging and MR imaging of db/db diabetic mice and found that lipid accumulation in diabetic kidney compromises the oxygenation of the renal tissue which makes it more susceptible to renal hypoxia.

3. Cui Y, Jiao Y, Chen YC, Wang K, Gao B, Wen S, Ju SH, Teng GJ. Aberrant brain functional connectivity related to insulin resistance in type 2 diabetes: a resting-state fMRI study. Diabetes, 2013 Dec 18. [Epub ahead of print]

This study believes that the abnormalities of spontaneous brain activity reflected by ALFF and ReHo measurements in the absence of structural changes in T2DM patients may provide insights into the neurological pathophysiology underlying diabetes-associated cognitive decline.

4. Chen HJ, Jiao Y, Zhu XQ, Zhang HY, Liu JC, Wen S, Teng GJ*. Brain Dysfunction Primarily Related to Previous Overt Hepatic Encephalopathy Compared with Minimal Hepatic Encephalopathy: Resting-State Functional MR Imaging Demonstration. Radiology. 2013;266(1):261-70.

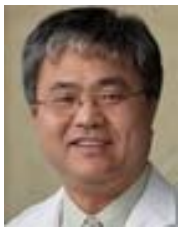
Key finding of this study is that the reduced resting-state brain functional connectivity (FC) within the default-mode network (DMN) is associated with neurocognitive impairments in minimal hepatic encephalopathy (MHE) and after clinical resolution of overt hepatic encephalopathy (OHE).

5. Wen S, Liu DF, Cui Y, Harris SS, Chen YC, Li KC, Ju SH, Teng GJ*. In vivo MRI detection of carotid atherosclerotic lesions and kidney inflammation in ApoE-deficient mice by using LOX-1 targeted iron nanoparticles. Nanomedicin. 2013 Oct 5. [Epub ahead of print]

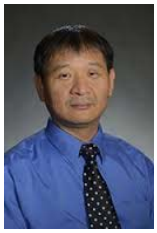
This study described a sensitive, specific and biocompatible lectin-like oxidized low-density lipoprotein receptor 1 (LOX-1)-targeted-USPIO probe for noninvasive MR imaging of carotid atherosclerotic lesions and glomerular disease in apoE-deficient mice.

Dr. Zhaohui Zhu from PUMCH would like to highlight the following:

Manuscript titled "Characterizing IgG4-related disease with 18F-FDG PET/CT: a prospective cohort study" was recently accepted by European Journal of Nuclear Medicine and Molecular Imaging (EJNMMI). He became an editorial board member of World Journal of Gastroenterology (WJG). His manuscript titled "Diagnosis and evaluation of gastric cancer with positron emission tomography" was also recently accepted by WJG. Another paper of significance to him and possibly the community: Wu P, Zhang Y, Sun Y, Shi X, Li F, Zhu Z. Clinical Applications of 18F-FDG PET/CT in Monitoring Anti-cancer Therapies. Curr Pharm Biotechnol. 2013;14(7):658-68.



Dr. **Fangyu Peng** from UT Southwestern has a paper accepted by J Nucl Med: Cai H, Wu JS, Muzik O, Hsieh JT, Lee RJ, Peng. Reduced ^{64}Cu Uptake and Tumor Growth Inhibition by Knockdown of Human Copper Transporter 1 in Xenograft Mouse Model of Prostate Cancer. *J Nucl Med*, in press. He was also an invited speaker to give a presentation titled "**^{64}CuCl2 – Prostate Cancer and other applications"** at an international workshop: **"**Diapeutic Medicine: $^{64}CuCl_2$", Casarano – Lecce, Italy.




Gang Cheng, MD, PhD, a former resident of **Dr. Hongming Zhuang** from the University of Pennsylvania and current attending nuclear medicine physician at the Veteran Administration Hospital in Philadelphia, has recently been appointed as an Assistant Professor of Clinical Radiology at Perelman School of Medicine, University of Pennsylvania.

In the recently held 99th Radiology Society of North America Scientific Assembly and Annual Meeting in Chicago, USA, a study presented by **Dr. Xuexian (Sean) Yan** won the prestigious molecular imaging travel award. The study titled '18F-fluorocholine PET/CT Detecting Prostate Cancer Recurrence: Is Dual-phase Imaging Really Beneficial?—Singapore Experience' answered an important question in clinical application of the novel PET tracer 18F-FCH. Out of 15 presentations selected for this year's travel awards in molecular imaging, this was the only one from Asia. Dr. Yan is a China educated, USA trained nuclear medicine physician currently working in Singapore General Hospital.

Dr. Baowei Fei was named as a Distinguished Investigator by the Academy of Radiology Research (ARR)**.** The Academy of Radiology Research is an alliance of 28 professional imaging societies. Established in 1995, the Academy was the catalyst for creating the National Institute of Biomedical Imaging and Bioengineering (NIBIB), for supporting its growth and development, for accelerating investment in vital imaging research areas by other NIH institutes, and for building support for radiology and imaging in Congress and the Executive Branch. The Academy is the umbrella organization to the Coalition for Imaging and Bioengineering Research (CIBR) and the Academic Council (ARRAC). The Distinguished Investigator Award was to recognize individuals for their accomplishments in imaging research. The program is intended to especially encourage those who have achieved scientific excellence while still being involved in clinical care, but it is not limited to clinician scientists only. Recipients of this award will become a member of the Council of Distinguished Investigators of the Academy of Radiology Research. Dr. Fei is a Georgia Cancer Coalition Distinguished Scholar and Director of the Quantitative BioImaging Laboratory (www.feilab.org) at Emory University School of Medicine. He is Associate Professor and a tenured faculty member in the Department of Radiology and Imaging Sciences and the Department of Mathematics and Computer Sciences at Emory University. He is also a faculty member in the Joint Department of Biomedical Engineering at Emory University and Georgia Institute of Technology. His current projects include molecular image-directed biopsy, advanced computer algorithms for medical processing and analysis, technology development and applications of multimodality imaging (optical, ultrasound, MRI, and PET), and image-guided focal therapy.

Prof. Zhuang Liu from Soochow University would like to acknowledge his two recent awards: 百千万人才工程国家级人选 (no English translation available) and the Chinese Chemical Society Young Scientist Award (中国化学会青年化学奖). Dr. Liu's research in the past few years was mostly focused on the development of functional nanomaterials including carbon nanomaterials, upconversion nanoparticles, organic

nanomaterials, and other multifunctional composite nanostructures, for the exploration of novel cancer diagnostic and therapeutic approaches. Starting from 2005, Dr. Liu has authored over 100 peer-reviewed papers (over 60 corresponding-author articles after joining Soochow University), many of which were published on top chemistry, materials and biomedicine journals (total citation > 9,700, H-index = 44). Other awards Dr. Liu received include MRS Silver Award in 2008 and SCOPUS young researcher award in 2012.

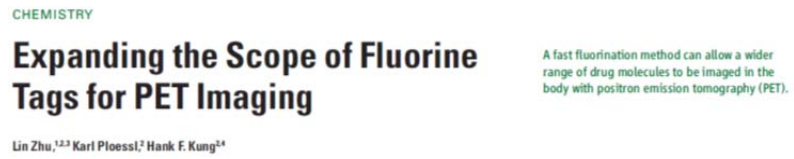
Mr. Zhibo (Zippo) Liu from University of British Columbia received a Chinese Government Award for Outstanding Students Abroad (国家优秀自费留学生奖学金). More details can be found from http://news.sciencenet.cn/htmlnews/2014/1/287527.shtm

Drs. Yanjun Fu and Benjamin Yeh at UCSF received a R21 grant from NIBIB/NIH titled “Complementary Injectable Tungsten Contrast for Dual Contrast Dual Energy CT”. They also received UCSF Clinical & Translational Science Institute (CTSI) 2013 Award for "Dual-Energy CT Contrast Materials". Dr. Fu was also promoted to Associate Research Scientist (step 1) from Assistant Research Scientist (Step 4). Representative Publications:

Varenika V, Fu Y, Gao D, Kakar S, Maher JJ, Cabarrus MC, Yeh BM. Contrast-enhanced CT quantification of hepatic fibrosis. Radiology. 2013; 266(1): 151-158.

Cyran CC, Fu Y, Rogut V, Chaopathomkul B, Wendland MF, Shames DM, Brasch RC. Evaluation of a novel macromolecular cascade-polymer contrast medium for dynamic contrast-enhanced MRI monitoring of antiangiogenic bevacizumab therapy in a human melanoma model. Acad Radiol. 2013; 20(10): 1256-1263.

Mongan J, Rathnayake S, Fu Y, Wang R, Jones EF, Gao DW, Yeh BM. In Vivo Differentiation of Complementary Contrast Media at Dual-Energy CT. Radiology. 2012; 265(1): 267-272.

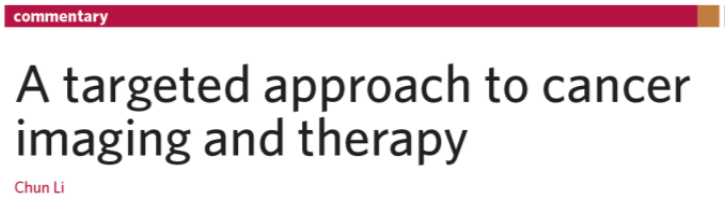

CHEMISTRY

Expanding the Scope of Fluorine Tags for PET Imaging

Lin Zhu,[1,2,3] Karl Ploessl,[2] Hank F. Kung[2,4]

A fast fluorination method can allow a wider range of drug molecules to be imaged in the body with positron emission tomography (PET).

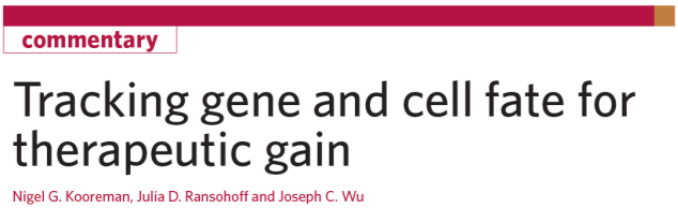
Profs. Lin Zhu and Hank Kung from Beijing Normal University and UPenn published a perspective article in **Science**, highlighting the work published by Huiban et al. (Nat Chem. 2013;5(11):941-4). A new method of labeling trifluoromethylarenes (Ar-CF_3) with ^{18}F would greatly facilitate the development new PET probes and allow the site of action of existing drugs.


commentary

A targeted approach to cancer imaging and therapy

Chun Li

Prof. Chun Li from MD Anderson published a commentary in **Nature Materials** (Li, C. Nature. Mater. 13, 110–115 (2014), discussing the use of nanoparticle-based multimodality imaging approaches to study the tumor microenvironment and imaging-guided interventions including drug deliver, surgery and ablation therapy.


commentary

Tracking gene and cell fate for therapeutic gain

Nigel G. Kooreman, Julia D. Ransohoff and Joseph C. Wu

Prof. Joseph Wu group from Stanford University wrote a commentary in **Nature Materials** stated that "the preclinical intersection of molecular imaging and gene- and cell-based therapies will enable more informed and effective clinical translation". How imaging can monitor cell and gene fate and function in vivo and overcome barriers associated with these therapies were discussed.


ARTICLES

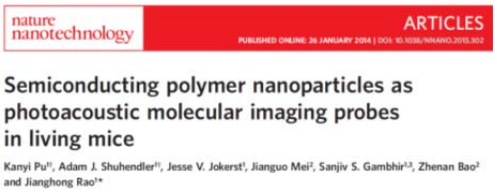
PUBLISHED ONLINE: 8 DECEMBER 2013 | DOI: 10.1038/NMAT3819

nature materials

A nanoparticle-based strategy for the imaging of a broad range of tumours by nonlinear amplification of microenvironment signals

Yiguang Wang[1], Kejin Zhou[1], Gang Huang[1], Christopher Hensley[2], Xiaonan Huang[1], Xinpeng Ma[1], Tian Zhao[1], Baran D. Sumer[3], Ralph J. DeBerardinis[2] and Jinming Gao[1]*

Prof. Jinming Gao group from UT Southwestern published a research article in **Nature Materials** (Nat Mater. 2014;13(2):204-12.) using a nonlinear amplification strategy that employs ultrasensitive pH-responsive fluorescent nanoparticles that illuminate within tumor neovasculature or in response to the tumor's acidic environment.


nature nanotechnology

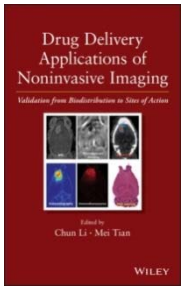
ARTICLES

PUBLISHED ONLINE: 26 JANUARY 2014 | DOI: 10.1038/NNANO.2013.302

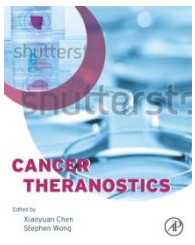
Semiconducting polymer nanoparticles as photoacoustic molecular imaging probes in living mice

Kanyi Pu[1†], Adam J. Shuhendler[1†], Jesse V. Jokerst[1], Jianguo Mei[2], Sanjiv S. Gambhir[1,3], Zhenan Bao[2] and Jianghong Rao[1]*

Prof. Jianghong Rao group from Stanford published a research article in **Nature Nanotechnology** describing near-infrared light absorbing semiconducting polymer nanoparticles as a new class of contrast agents for photoacoustic molecular imaging.

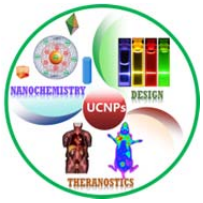


Profs. **Chun Li** (MD Anderson) and **Mei Tian** (Zhejiang University) co-edited a booked titled "Drug Delivery Applications of Noninvasive Imaging: Validation from Biodistribution to Sites of Action" (publisher: Wiley). This offers a full arsenal of tested and proven methods, practices and guidance, enabling readers to overcome the many challenges in creating successful new drug delivery systems.



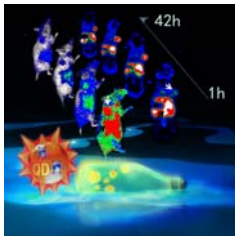
Drs. **Xiaoyuan Chen** (NIH) and **Stephen Wong** (Methodist Hospital Research Institute) co-edited a book titled "Cancer Theranostics" (publisher: Elsevier). This book defines the concept of theranostics and discusses topics related to cancer biomarkers, molecular imaging probes, imaging guided therapy, nanoparticle platforms and translational perspective.

Dr. Xiaoyuan (Shawn) Chen group at NIH published over 50 papers in year 2013, some of which were chosen as journal cover or covered by news media.

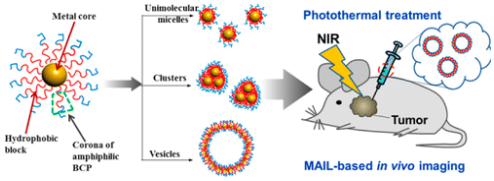


Chen G, Qiu H, Prasad PN, Chen X. Upconversion Nanoparticles: Design, Nanochemistry, and Applications in Theranostics. Chem Rev, in press.
This review summarizes recent progresses in design and applications of UCNPs with an emphasis on the role of nanochemistry in the advancement of this field.

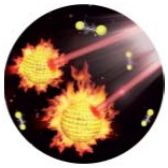
Wang Z, Wang Z, Liu D, Yan X, Wang F, Niu G, Yang M, Chen X. Biomimetic RNA-Silencing Nanocomplexes: Overcoming Multidrug Resistance in Cancer Cells. Angew Chem Int Ed Engl. 2014;53:1997-2001 (back cover).
This work is the result of collaboration between **Dr. Min Yang** (Jiangsu Institute of Nuclear Medicine) and Dr. Shawn Chen (NIH). Several news media including Phys.org covered the story.



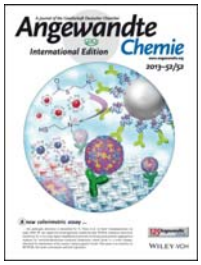
Sun X, Huang X, Guo J, Zhu W, Ding Y, Niu G, Wang A, Kiesewetter DO, Wang ZL, Sun S, Chen X. Self-Illuminating 64Cu-Doped CdSe/ZnS Nanocrystals for in Vivo Tumor Imaging. J Am Chem Soc. 2014; 136 (5):1706–1709.
This study developed a self-illuminating QD system by doping ^{64}Cu into CdSe/ZnS core/shell QDs via a cation-exchange reaction. The new probes exhibit efficient Cerenkov resonance energy transfer (CRET) for excellent tumor targeting.



He J, Huang X, Li Y-C, Liu Y, Babu T, Aronova MA, Wang S, Lu Z, Chen X*, Nie Z*. Self-assembly of amphiphilic plasmonic micelle-like nanoparticles in selective solvents. J Am Chem Soc, 2013;135(21):7974-84.
This work is a result of collaboration between **Dr. Zhihong Nie** group at University of Maryland and Chen group at NIH. Amphiphilic plasmonic micelle-like nanoparticles (APMNs) composed of gold nanoparticles (AuNPs) and amphiphilic block copolymers (BCPs) structurally resemble polymer micelles were developed for bioimaging and photothermal therapy of cancer.



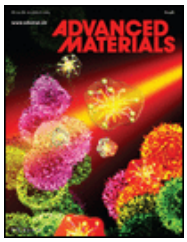
Huang P, Lin J, Li W, Wang Z, Wang S, Wang X, Sun X, Aronova M Niu G, Leapman RD, Nie Z, Chen X. Biodegradable gold nanovesicles with an ultrastrong plasmonic coupling effect for photoacoustic imaging and photothermal therapy. Angew Chem Int Ed Engl, 2013; 52(52):13958-64. (Frontispiece)
This work was also a product of collaboration between Nie group and Chen group. A novel theranostic platform based on biodegradable plasmonic gold nanovesicles was developed for for photoacoustic (PA) imaging and photothermal therapy (PTT).



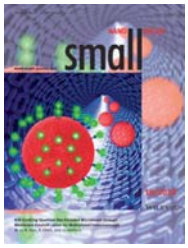
Liu D, Wang Z, Jin A, Huang X, Sun X, Wang F, Yan Q, Ge S. Xia N, Niu G, Liu G, HightWalker AR, Chen X. Acetylcholinesterase-catalyzed hydrolysis allows ultrasensitive detection of pathogens with the naked eye. Angew Chem Int Ed Engl, 2013; 52(52):14065-9. (back cover)
An improved heterogeneous sandwich-type ELISA enhances detection sensitivity by a two-step signal amplification process involving gold particle aggregation induced by acetylcholinesterase-catalyzed hydrolysis, which leads to a color change (colorimetric assay), followed by enrichment of the analyte using magnetic beads. This assay is as sensitive as RT-PCR, but more convenient and less expensive.

Lu J, Frerich JM, Turtzo LC, Li S, Chiang J, Yang C, Wang X, Zhang C, Wu C, Sun Z, Niu G, Zhuang Z, Brady RO, Chen X. Histone deacetylase inhibitors are neuroprotective and preserve NGF-mediated cell survival following traumatic brain injury. Proc Natl Acad Sci U S A. 2013;110(26):10747-52.

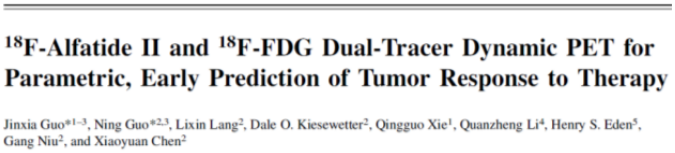
This study demonstrates that the preservation of sufficient expression of nerve growth factor (NGF) and activation of the neurotrophic tyrosine kinase receptor type 1 (TrkA) pathway following HDACi treatment is crucial in stimulating the survival of CNS cells after traumatic brain injury (TBI).



Wang S, Huang P, Nie L, Xing R, Liu D, Wang Z, Lin J, Chen S, Niu G, Lu G, Chen X. Single Continuous Wave Laser Induced Photodynamic/Plasmonic Photothermal Therapy Using Photosensitizer-Functionalized Gold Nanostars. Adv Mater, 2013;25(22):3055-61. (cover feature)
This work was collaboration between Chen group and **Dr. Guangming Lu** group at Jinling Hospital. A novel theranostic system based on chlorin e6 coupled gold nanostars for imaging, and photodynamic and photothermal therapy was realized.



Wang X, Wang G, Li W, Zhao B, Xing B, Leng Y, Dou H, Sun K, Shen L, Yuan X, Li J, Sun K, Han J, Xiao H, Li Y, Huang P, Chen X. Near-infrared Emitting Quantum Dots Encoded Microbeads Through Membrane Emulsification Route For Multiplexed Immunoassays. Small, 2013; 9(19):3327-35. (back cover)
Collaboration between **Dr. Wanwan Li** at Shanghai Jiaotong University and Chen group at NIH resulted in this work, which highlights the feasibility of NIR-emitting CdSeTe/CdS/ZnS core/shell/shell QD-encoded microbeads combined with common flow cytometry with one laser for multiplexed detection of hepatitis B virus (HBV).


^{18}F-Alfatide II and ^{18}F-FDG Dual-Tracer Dynamic PET for Parametric, Early Prediction of Tumor Response to Therapy

Jinxia Guo*[1–3], Ning Guo*[2,3], Lixin Lang[2], Dale O. Kiesewetter[2], Qingguo Xie[1], Quanzheng Li[4], Henry S. Eden[5], Gang Niu[2], and Xiaoyuan Chen[2]

Guo J, Guo N, Lang L, Kiesewetter DO, Xie Q, Li Q, Eden HS, Niu G, Chen X. 18F-Alfatide II and 18F-FDG Dual-Tracer Dynamic PET for Parametric, Early Prediction of Tumor Response to Therapy. J Nucl Med. 2014;55(1):154-60.
Collaboration among the groups of Drs. **Qingguo Xie** (Huazhong University of Science and technology), **Quanzheng Li** (Harvard Medical School) and Xiaoyuan Chen (NIH) analyzed dual-tracer dynamic imaging through compartmental modeling.

ARTICLE

Received 18 Feb 2013 | Accepted 5 Jul 2013 | Published 1 Aug 2013 DOI: 10.1038/ncomms3266

Octapod iron oxide nanoparticles as high-performance T_2 contrast agents for magnetic resonance imaging

Zhenghuan Zhao[1], Zijian Zhou[1], Jianfeng Bao[2], Zhenyu Wang[2], Juan Hu[1], Xiaoqin Chi[3], Kaiyuan Ni[1], Ruifang Wang[2], Xiaoyuan Chen[4], Zhong Chen[2] & Jinhao Gao[1,5]

Prof. Jinhao Gao from Xiamen University recently publsihed a paper in Nature Communications (Nat Commun. 2013;4:2266) describing the synthesis of size-controllable octapod iron oxide nanoparticles by introducing chloride anions. The particles with ultrahigh transverse relaxivity values are highly promising for sensitive, early stage and accurate detection of tumor.

Construction and Validation of Nano Gold Tripods for Molecular Imaging of Living Subjects

Kai Cheng, Sri-Rajasekhar Kothapalli, Hongguang Liu, Ai Leen Koh, Jesse V Jokerst, Han Jiang, Meng Yang, Jinbo Li, Jelena Levi, Joseph C. Wu, Sanjiv Sam Gambhir, and Zhen Cheng

J. Am. Chem. Soc., **Just Accepted Manuscript** • DOI: 10.1021/ja412001e • Publication Date (Web): 04 Feb 2014

Prof. Zhen Cheng from Stanford recently published a paper in JACS describing a controlled, stepwise strategy to build novel anisotropic branched gold nano-architectures (Au-tripods) with predetermined composition and morphology for bio-imaging.

A Comparative Study of Radiolabeled Bombesin Analogs for the PET Imaging of Prostate Cancer

Yang Liu[1,2], Xiang Hu[2], Hongguang Liu[2], Lihong Bu[2], Xiaowei Ma[2], Kai Cheng[2], Jinbo Li[2], Mei Tian[1], Hong Zhang[1], and Zhen Cheng[2]

Liu Y, Hu X, Liu H, Bu L, Ma X, Cheng K, Li J, Tian M, Zhang H, Cheng Z. A comparative study of radiolabeled bombesin analogs for the PET imaging of prostate cancer. J Nucl Med. 2013;54(12):2132-8.

With the collaboration between Profs. Zhen Cheng at Stanford and Hong Zhang at Zhejiang Universiyty, they evaluated ^{18}F-AlF-(aluminum-fluoride) and ^{64}Cu-radiolabeled RM1 and AMBA analogs for PET imaging of gastrin-releasing peptide receptor (GRPR) in PCa.

Prof. Xingdong Zhang, honorary director of the National Engineering Research Center for Biomaterials, Sichuan University was elected to the National Academy of Engineering as one a foreign associate for his contributions to musculoskeletal medical therapies and biomaterial product development. This brings the total U.S. membership to 2,250 and the number of foreign associates to 214.

Job Advertisement

Prof. Yueqing Gu lab at the China Pharmaceutical University is recruiting two faculty members in the areas of: 1) organic/polymer material synthesis; 2) bioinformatics/computer assisted drug design. More details about Prof. Gu's research can be found here: http://en.cpu.edu.cn/Detail.aspx?id=395. Interested individuals please cotact Prof. Gu: guyueqing@cpu.edu.cn.

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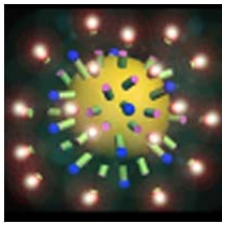
Center for Molecular Imaging and Translational Medicine, Xiamen University

The Center for Molecular Imaging and Translational Medicine at Xiamen University (http://mitm.xmu.edu.cn/) is actively recruiting faculty members, postdoctoral fellows and staff scientists of all levels with experience and expertise in one or more of the following: molecular imaging probe design, nanomedicine, biomedical engineering, cellular and molecular biology. Interested individuals please contact Prof. Xianzhong Zhang: zhangxzh@xmu.edu.cn.



The Laboratory of Molecular Imaging and Nanomedicine (LOMIN) at the National Institutes of Health (http://www.nibib.nih.gov/research/labs-at-nibib/laboratory-molecular-imaging-and-nanomedicine-lomin) is looking for multiple postdoctoral fellows with the following expertise: synthesis and modification of peptides, oligonucleotides and aptamers; PET radiochemistry; PET and MR scanner operation and kinetic modeling; nanosensors for biomarker detection; cellphone-based devices for bioanalytical sciences; nanomaterials for imaging and drug/gene delivery. Motivated individuals please submit your CV and research plan to Dr. Xiaoyuan (Shawn) Chen: shawn.chen@nih.gov

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Newsletter Editor:

Xiaoyuan (Shawn) Chen, Ph.D.
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