



# 中-日-新之金属纳米团簇及 生物材料研讨会

The China-Japan-Singapore Symposium on  
Metal Nanoclusters and Biomaterials

2018年10月18日 | 18 Oct 2018

中国·青岛 | Qingdao China

# 会议手册

主办单位：青岛科技大学材料学院 | 协办单位：青岛科技大学



## Welcome Address

Distinguished guests and friends,

Very good morning! On the occasion of this beautiful autumn, we are delighted that we could invite ten top scientists in fields of metal nanoclusters and biomaterials from Japan, Singapore, and China to visit Qingdao University of Science and Technology (QUST) and participate in the "China-Japan-Singapore Symposium on Metal Nanoclusters and Biomaterials ". On behalf of all the faculty and students, I would like to express our warm welcome and sincere gratitude to all the invited experts in the symposium.

Firstly, please allow me to provide a brief introduction of QUST to our respected guests. QUST was established in 1950. It is a science and technology-oriented university with coordinated development of multidiscipline including engineering, mathematics, culture, economics, management, law, art, etc. The university has three campuses, located in Laoshan, Sifang and Gaomi districts, with total area of 700,000 square meters. The library has a collection of > 1.6 million documents and a total fixed asset of 1.9 billion RMB. The university has more than 30,000 full-time undergraduate students and more than 3,000 graduate students. It has 3 first-level doctoral programs, 21 second-level doctoral programs, 4 post-doctoral mobile working stations, and 20 subjects for 122 master degree programs. Currently, we have one National Engineering Laboratory, one National Engineering Technology Research Center, one National Key Cultivation Base of Laboratory, three Key Laboratories and Engineering Research Centers of the Ministry of Education, 30 state-level key disciplines, key laboratories, engineering technology research centers, 13 municipal key laboratories, engineering technology research centers and industry centers.

This symposium is organized by the School of Materials Science and Engineering. Established in March 2006, the school currently has one mobile working station for postdoctoral researcher in materials science and engineering; one doctoral degree program in materials science and engineering, materials physics and chemistry, materials science, and material processing engineering; six master degree programs in catalysis, inorganic chemistry, and materials engineering. Among them, the first-level discipline of materials science and engineering is granted as

the “dual-first class” key construction discipline by Shandong Province, and ranked as world's ESI top 1% discipline. Moreover, there are several state- and city-level key research centers and laboratories in the school such as Shandong Research Center of Nanomaterials Engineering Technology, Shandong Province Key Laboratory of Nanomaterials Engineering Technology, Qingdao Industry Center of Nanomaterials, Qingdao Key Laboratory of Nanotechnology, and National Nano Industry Testing Center.

It should be mentioned that QUST pays particular attention to extensive academic communications and collaborations with experts both at home and abroad. We not only invite famous experts visit QUST for insightful academic thoughts, but also send our faculty and students out for learning new knowledge, thereby striving to shape our team of staffs with strong teaching and research capabilities. With this purpose in our mind, we thus invite famous experts just like the respected guest in this room now, and organize this “China-Japan-Singapore Symposium on Metal Nanoclusters and Biomaterials ”.

As known, both metal nanoclusters and biomaterials are hotspots in research fields, which are also the key materials that will be refocus developed by Shandong Province. Today, the guests we invited here are well-known experts from the field of clusters and biomaterials. They have high academic reputations and rich scientific research experience. Therefore, we believe that this symposium will be very successful in sharing updated research progress in the field, and communicating extensively with others, which in turn will certainly promote the research advances for both invited experts and our university in related fields.

I sincerely wish all participants could benefit from this symposium, enhance communications, broaden research horizons and gain friendship.

Finally, I would like to convey my highest appreciation to the invited experts and scholars for their great efforts in contributing to this symposium. Thank you very much for your support and attention!

Prof. Guangye Liu  
Vice President of QUST  
18 Oct, 2018

# 欢迎辞

尊敬的与会嘉宾、各位朋友们：

大家好！欢迎诸位专家在这丹桂飘香，叠翠流金之际，来到我校参加“中-日-新之金属纳米团簇及生物材料研讨会”。我谨代表全体师生，对参加此次会议的团簇及生物材料领域的各位国内外知名专家，表示诚挚的感谢。

青岛科技大学建于1950年，是一所以工为主，理、工、文、经、管、医、法、艺等学科协调发展，以材料学、化学工程、应用化学、机械工程、自动化、信息与计算机为特色学的综合性大学。学校现有崂山、四方、高密三个校区，校舍面积70万平方米，图书馆馆藏各类文献资料160万册，固定资产总值19亿元。学校有全日制在校生3万余人，其中研究生3000余人。拥有3个一级学科博士点，21个二级学科博士点，4个博士后流动站，20个硕士学位授权一级学科，122个硕士点；拥有1个国家工程实验室，1个国家工程技术研究中心，1个国家重点实验室培育基地，3个教育部重点实验室、工程研究中心，30个省级重点学科、重点实验室、工程技术研究中心，13个青岛市重点实验室、工程技术研究中心和行业中心。

青岛科技大学材料科学与工程学院成立于2006年3月，现有材料科学与工程博士后流动站，材料科学与工程一级学科博士学位授予点，材料物理与化学、材料学、材料加工工程、工业催化、无机化学、材料工程六个硕士学位授予点。其中材料科学与工程一级学科为山东省“双一流”重点建设学科，世界ESI排名前百分之一，为学校特色优势学科。学院拥有山东省纳米材料工程技术研究中心、山东省纳米材料工程技术重点实验室、青岛市纳米材料行业中心、青岛市纳米技术重点实验室以及全国纳米行业检测中心。

学校注重开展广泛的国内外学术交流与合作，采取“请进来、送出去”的人

人才培养战略，积极与国际教育、科研接轨，努力打造一支掌握高新知识、教学科研复合型的教师队伍，以科研促教学，以教学助科研。材料学院也正是以此为出发点，广邀十方科研俊杰，举办本次“中-日-新金属纳米团簇及生物材料研讨会”。

金属纳米团簇和生物材料都是当今研究领域的前沿热点，也是山东省新旧动能转换重大工程中重点发展的新材料类别中的典型。今天，莅临此次研讨会的各位嘉宾，均是来自团簇及生物材料领域的国内外知名专家，有着深厚的学术功底和丰富的科研经验，因此，我们相信，这次学术研讨会，通过各位专家与我们分享学术前沿成果，开展广泛而深入地交流与合作，必将促进与会专家及我校在相关领域的发展与进步。

我衷心祝愿全体参会人员能在此次会议中博采众长、增进交流、开拓视野、收获友谊。

最后，再次衷心感谢各位专家学者不辞劳苦，远道而来，为此次研讨会付出艰辛劳动，感谢各位同仁的鼎力支持相助！最后预祝此次学术交流会圆满成功！谢谢大家！

发言人：刘光焯教授

青岛科技大学副校长

2018.10.18

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## 一、会议基本信息 (Symposium Information)

### 1. 会议地址 (Venue)

中国山东省青岛市市北区郑州路53号, 青岛科技大学四方校区尚舜学术报告厅 (讲学厅)。

53 Zhengzhou Road, Shibei District, Qingdao 266042, P.R. China, Shangshun Lecture Hall, Sifang Campus of QUST

### 2. 会议时间 (Date)

2018年10月18日上午8: 00-11:50; 下午13: 20-20: 30。

18 Oct 2018, 8: 00 -11:50; 13: 20-20: 30.

### 3. 住宿 (Accommodations)

锦江都城(青岛新都心店) 位置: 青岛市北区黑龙江南路162号。

Jinjiang Metropolo Hotel (Qingdao Xinduxin Shuangshan Metro Station)

Hotel Address: 162 Heilongjiang Road, Shibei District, Qingdao 266042, P.R. China.

注:我们会安排专人接站/接机。

Note: We will arrange picking up service at the train station/airport for you.

### 4. 会议联系人 (Contacts)

联系人(Contacts)	电话(Phone)	邮箱(Email)
袁勋 (Xun Yuan)	13789870350	yuanxun@qust.edu.cn
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窦新玥 (Xinyue Dou)	15063026829	d-xinyue@163.com
王子平 (Ziping Wang)	13061487216	2580547932@qq.com

### 5. 会议简介 (Symposium Theme)

本会议邀请10名团簇及生物材料领域的国内外知名专家, 每人作40分钟的专题报告, 旨在金属纳米团簇及生物材料等领域开展广泛而深入地交流与合作, 促进与会专家及青岛科技大学在相关领域的发展。

We have successfully invited ten famous experts in fields of metal nanoclusters and bio-materials from home and abroad to participate in this symposium, and each expert will deliver a keynote talk of 40 mins. The aim of this symposium is to offer a platform for sharing updated research progress, and conducting extensive communications and possible collaborations, which will in turn promote the advances of both the experts and QUST in these fields.



## 二、会议日程安排

<b>Schedule for China-Japan-Singapore Symposium on Metal Nanoclusters and Biomaterials</b>		
<b>Date:</b> 18 Oct 2018; <b>Venue:</b> Shangshun Lecture Hall, Sifang Campus of QUST		
Time	Theme	Guest Speakers
08:00-08:20	Introduction and welcome	<b>Prof. Xun YUAN</b> The Conference Organizer
08:20-08:40	Opening speech	<b>Prof. Guangye LIU</b> Vice President of QUST
<b>Session 1</b> <b>Chair: Prof. Katsuaki KONISHI</b>		
08:40-09:20	Engineering ultrasmall metal nanoclusters for biomedical applications	<b>Prof. Jianping XIE</b> National University of Singapore
09:25-10:05	Synthesis, assembly mechanism and functionality of metal nanoclusters	<b>Prof. Di SUN</b> Shandong University, Awardee of the National Science Fund for Excellent Young Scholars
10:05-10:25	Coffee break	
<b>Session 2</b> <b>Chair: Prof. Yuichi NEGISHI</b>		
10:25-11:05	Subnanometer gold clusters: How is different from nano?	<b>Prof. Katsuaki KONISHI</b> Hokkaido university
11:10-11:50	Understanding the growth mechanism of thiolated gold nanoclusters by single crystal X-ray diffraction	<b>Prof. Shuxin WANG</b> Anhui University
11:50-13:20	Lunch	

<b>Session 3</b>		
<b>Chair: Prof. Jianping XIE</b>		
13:20-14:00	Precise synthesis of platinum and alloy clusters and elucidation of their structures	<b>Prof. Yuichi NEGISHI</b> Tokyo University of Science
14:05-14:45	Carbon nanostructure augmented cancer therapy	<b>Prof. Huiyu LIU</b> Beijing University of Chemical Technology, Awardee of the National Science Fund for Excellent Young Scholars
14:50-15:30	Nanomaterials induced Endothelial Leakiness (NanoEL)	<b>Prof. David LEONG</b> National University of Singapore
15:30-15:50	Coffee break	
<b>Session 4</b>		
<b>Chair: Prof. David LEONG</b>		
15:50-16:30	Hydride doping to chemically-modified gold-based superatoms	<b>Prof. Tatsuya TSUKUDA</b> The University of Tokyo
16:35-17:15	Unravelling the long-pursued Au <sub>144</sub> structure by X-ray crystallography	<b>Prof. Zhikun WU</b> Institute of Material Science, CAS Awardee of the National Science Fund for Excellent Young Scholars
17:20-18:00	Employing self-assembly for biomedical imaging applications	<b>Prof. Gaolin LIANG</b> University of Science and Technology of China Awardee of the National Science Fund for Distinguished Young Scholars
18:05-20:30	Group photo and dinner	

## 中-日-新之金属纳米团簇及生物材料研讨会

### 日程安排

时间: 2018年10月18日; 地点: 青岛科技大学四方校区尚舜报告厅

时间	主题	特邀嘉宾
08:00-08:20	嘉宾入场, 大会开幕	<b>袁勋教授</b> 青岛科技大学会议承办方代表
08:20-08:40	致开幕辞	<b>刘光桦教授</b> 青岛科技大学副校长
<b>第一组</b>		
<b>主持人: Katsuaki Konishi教授</b>		
08:40-09:20	Engineering ultrasmall metal nano-clusters for biomedical applications	<b>谢建平教授</b> 新加坡国立大学
09:25-10:05	Synthesis, assembly mechanism and functionality of metal nanoclusters	<b>孙颀教授</b> , 国家优青基金获得者 山东大学
10:05-10:25	茶休	
<b>第二组</b>		
<b>主持人: Yuichi Negishi教授</b>		
10:25-11:05	Subnanometer gold clusters: How is different from nano?	<b>Katsuaki Konishi教授</b> 北海道大学
11:10-11:50	Understanding the growth mechanism of thiolated gold nanoclusters by single crystal X-ray diffraction	<b>汪恕欣研究员</b> 安徽大学
11:50-13:20	用餐、午休	
<b>第三组</b>		
<b>主持人: 谢建平教授</b>		
13:20-14:00	Precise synthesis of platinum and alloy clusters and elucidation of their structures	<b>Yuichi Negishi教授</b> 东京理科大学
14:05-14:45	Carbon nanostructure augmented cancer therapy	<b>刘惠玉教授</b> , 国家优青基金获得者 北京化工大学
14:50-15:30	Nanomaterials induced Endothelial Leakiness (NanoEL)	<b>David Leong教授</b> 新加坡国立大学
15:30-15:50	茶休	

<b>第四组</b> <b>主持人: David Leong教授</b>		
15:50-16:30	Hydride doping to chemically-modified gold-based superatoms	<b>Tatsuya Tsukuda教授</b> 东京大学
16:35-17:15	Unravelling the long-pursued Au <sub>144</sub> structure by X-ray crystallography	<b>伍志鲲研究员</b> , 中科院百人, 国家 优青基金获得者 中科院合肥物质科学研究院
17:20-18:00	Employing self-assembly for biomedical imaging applications	<b>梁高林教授</b> , 国家杰青基金获得者 中国科学技术大学
18:05-20:30	合影留念及晚宴	

### 三、主题报告摘要及专家简介

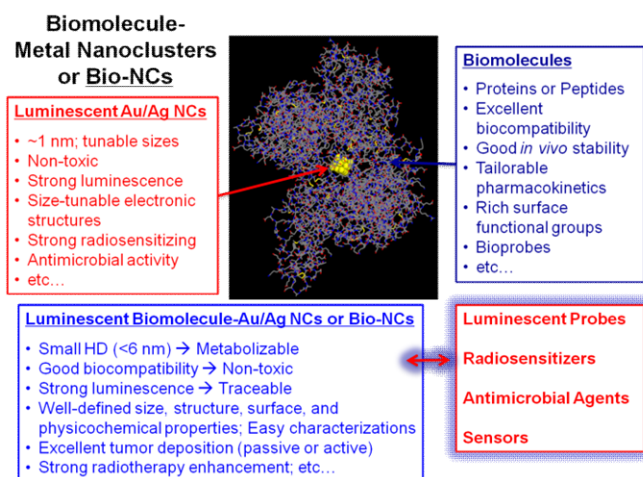
## Engineering ultrasmall metal nanoclusters for biomedical applications

Jianping XIE

*Department of Chemical and Biomolecular Engineering, National University of Singapore, 4 Engineering Drive 4, Singapore 117585, Singapore*

**Email:** chexiej@nus.edu.sg

Ultrasmall metal nanoclusters (NCs) have attracted increasing attention from the scientific community due to their fascinating physicochemical properties. Today, functional metal NCs are finding growing acceptance in biomedical applications. To achieve a better performance in biomedical applications, metal NCs can be interfaced with biomolecules, such as proteins, peptides, and DNA, to form a new class of biomolecule-NC composites (or bio-NCs in short), which typically show synergistic or novel physicochemical and physiological properties. In this talk, I will discuss some of our recent studies at the interface of metal NCs and biomolecules, highlighting some unique physicochemical properties and the biological functions of bio-NCs.



**Fig. 1** Biomolecule-Metal Nanoclusters (or Bio-NCs): properties and applications.

**Keywords:** Nanoclusters; Gold and silver nanoclusters; Cluster total synthesis; Biomedical materials.

## Biography (个人简介)



**Prof. Jianping XIE** is currently an Associate Professor at the Department of Chemical & Biomolecular Engineering at National University of Singapore (NUS). He received his B.S. and M.S. in Chemical Engineering from Tsinghua University, China, and his Ph.D. from the Singapore-MIT Alliance (SMA) program. Dr. Xie joined NUS in 2010 and established the BioNanoMetals research group. His group is known for the work on engineering subnanometer-sized metal nanoclusters for biomedical and environmental applications. Dr. Xie has 150+ publications, 12000+ citations, an H-index of 59, and 25 highly cited papers (ISI). His research interests include noble metal nanoclusters, nanomedicine, and applied environmental nanotechnology.

**谢建平 教授**，新加坡国立大学（NUS）化学和生物分子工程系教授。谢教授先后在清华大学获得本科和硕士学位，然后在NUS获新加坡国立大学与美国麻省理工学院联合培养博士学位。其研究领域包括贵金属纳米团簇、纳米医学及应用环境纳米技术。自2010年加入NUS后建立了生物纳米金属材料研究团队，该团队主要研究方向为贵金属纳米团簇的生物医学及环境的应用。谢教授已在 *Nat. Commun.*, *J. Am. Chem. Soc.*, *Angew. Chem. Int. Ed.*, *Acc. Chem. Res.*等期刊上发表论文150余篇，其中高被引论文25篇，它引12000多次，H指数为59。

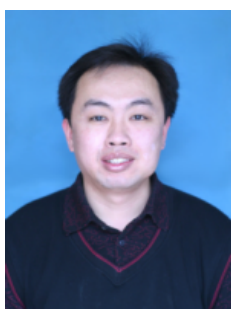


## Synthesis, assembly mechanism and functionality of metal nanoclusters

Di SUN

*School of Chemistry and Chemical Engineering, Shandong University,  
Rm 415 South Chemistry Building, South Shanda Road 27, Jinan 250100,  
People's Republic of China  
Email: dsun@sdu.cn*

### Biography (个人简介)



**Prof. Di SUN**, Professor of Chemistry and Chemical Engineering, Shandong University, winner of National excellent Youth Fund. He received his B.S. (2005) from Liaocheng University, and M.S. (2008) and his Ph.D. (2011) in Inorganic Chemistry from Xiamen University under the supervision of Professor Rong-Bin Huang and Lan-Sun Zheng, respectively. Since then, he join the School of Chemistry and Chemical Engineering, Shandong University. His research interests include the photo luminescent silver coordination complexes including clusters and polymers, crystal engineering, polynuclear metal clusters, assembly mechanism and so on. Since 2009, he has Published 200+ research papers including 146 papers as the first author or corresponding author and over 100 papers with  $IF > 3$ . His research works were cited by many international famous academic journals such as *PNAS*, *Nat. Commun.*, *J. Am. Chem. Soc.*, *Angew. Chem. Int. Ed.*, *Chem. Sci.*. He was also invited by *Nat. Rev. Chem.*, *ChemViews* and other academic organizations or websites to write a highlight review. Until now, the total citation of his papers is over 5000 and H-index of 40.

**孙頔 教授**, 山东大学化学与化工学院, 国家优青基金获得者。2005年在聊城大学获得学士学位, 2008年和2011年在厦门大学分别获得硕士(导师: 黄荣彬&郑兰荪)和博士学位(导师: 郑兰荪)。其研究方向为光致发光的银光协调配合物, 包括聚类和聚合物、晶体工程、多核金属簇、装配机制等。自2009至今, 在*PNAS*, *Nat. Commun.*, *J. Am. Chem. Soc.*, *Angew. Chem. Int. Ed.*, *Chem. Sci.*等国际期刊发表SCI论文近200篇, 其中第一或通讯作者身份发表SCI论文146篇, 影响因子3.0以上100余篇。研究工作被*Chem. Rev.*, *Chem. Soc. Rev.*, *Angew. Chem. Int. Ed.*, *J. Am. Chem. Soc.*等许多国际著名学术期刊论文引用。同时也被*Nat. Rev. Chem.*, *ChemViews*等学术组织或网站作专文亮点评述。论文引用高达5000次, H指数=40。

## Subnanometer gold clusters: How is different from nano?

Katsuaki KONISHI

*Faculty of Environmental Earth Science, Graduate School of Environmental Science,  
Hokkaido University, Sapporo, Japan*

**Email:** konishi@ees.hokudai.ac.jp

### Biography (个人简介)



**Prof. Katsuaki KONISHI** received Bachelor, Master and PhD degrees from the University of Tokyo. After graduation, he joined the University of Tokyo as a lecturer and was then promoted as an assistant professor. In 2001, Prof. Konishi moved to Hokkaido University as an associate professor, and was appointed as a full professor in 2008. Prof. Katsuaki Konishi's research interests focus on the controllable design and synthesis of phosphate ligands protected metal clusters and their application in the field of environment. Professor Konishi has gained high academic reputations in the synthesis and application of metal nanoclusters protected by phosphate ligands. Currently, he has published 100+ papers in top journals such as *J. Am. Chem. Soc.*, *Angew. Chem. Int. Ed.* and so on.

**Katsuaki Konishi 教授**, 先后在东京大学获得学士、硕士及博士学位，毕业后留校工作获得东京大学讲师及助理教授。于2001-2008，聘为北海道大学副教授。在2008-至今，获聘北海道大学教授。Konishi教授的研究兴趣集中于磷配体保护的金属纳米团簇的可控设计与合成，及其在环境方面的应用。Konishi教授在磷配体保护的金属纳米团簇的合成与应用方面建树颇丰，至今在*J. Am. Chem. Soc.*, *Angew. Chem. Int. Ed.*等期刊发表高水平论文上百篇。

## Understanding the growth mechanism of thiolated gold nanoclusters by single crystal X-ray diffraction

Shuxin WANG

*Department of Chemistry, Center for Atomic Engineering of Advanced Materials, Anhui Province Key Laboratory of Chemistry for Inorganic/Organic Hybrid Functionalized Materials, Anhui University, Hefei, Anhui 230601, China*

**Email:** [ixing@ahu.edu.cn](mailto:ixing@ahu.edu.cn)

### Biography (个人简介)



**Prof. Shuxin WANG** received B.S in 2008, M.S. in 2012 and Ph.D in 2016 at college of chemical & chemical engineering, Anhui University. He studied in the Carnegie Mellon University (United States) as a visiting student during Dec 2014 and May 2016. He was appointed as a specially-appointed professor in 2016 at Anhui University. His research interests focus on the controllable synthesis and characterization of noble metal clusters, alloy nanoclusters and their applications in catalysis and sensor development. Until now, he has published over 20 papers in international top journals including *Nat. Commun.*, *Sci. Adv.*, *J. Am. Chem. Soc.*, *Angew. Chem. Int. Ed.* and *Chem. Sci.* with a total citation 600+.

汪恕欣 研究员，2008年毕业于安徽大学化学化工学院，获理学学士学位；2012年毕业于安徽大学化学化工学院，获理学硕士学位；2016年毕业于安徽大学化学化工学院，获博士学位，期间（2014年12月至2016年5月）在美国Carnegie Mellon大学联合培养。2016年获聘安徽大学特任研究员。汪恕欣研究员的研究方向集中在金/银团簇的可控合成与表征，以及团簇在催化化学反应、生物传感中的应用。近年来陆续在*Nat. Commun.*, *Sci. Adv.*, *J. Am. Chem. Soc.*, *Angew.*, *Chem. Int. Ed.*, *Chem. Sci.*, *Inorg. Chem.*, *Chem. Mater.*, *Chem. Commun.*, *Nanoscale*等著名杂志发表高水平论文20余篇。论文它引600余次。

## Precise synthesis of platinum and alloy clusters and elucidation of their structures

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In recent years, it has become possible to synthesize gold clusters, silver clusters, and alloy clusters with atomic precision using thiolate or phosphine ( $\text{PR}_3$ ) as a ligand. The electronic/geometric structures and size-specific physical/chemical properties of these metal clusters have also been investigated extensively. Similar to these metal clusters, platinum (Pt) clusters have also attracted much interest. An attractive feature of Pt clusters is their high catalytic activity in a variety of reactions. In the precise synthesis of these Pt clusters, carbon monoxide (CO) or  $\text{PR}_3$  is used as the main ligand. However, little information has been obtained on the electronic structure and physical/chemical properties of  $\text{Pt}_n(\text{CO})_m(\text{PR}_3)_l$  clusters to date. In this research, the final objective is to obtain experimental information about the largely unknown electronic structure of  $\text{Pt}_n(\text{CO})_m(\text{PR}_3)_l$  clusters. To this end, we precisely synthesized a  $\text{Pt}_{17}$  cluster ( $[\text{Pt}_{17}(\text{CO})_{12}(\text{PPh}_3)_8]^{n+}$ ;  $n = 1, 2$ ) protected by CO and triphenylphosphine ( $\text{PPh}_3$ ) by a simple method and studied its geometric and electronic structure. Mass spectrometry, elemental analysis, and single-crystal X-ray structural analysis of the product revealed that the obtained  $\text{Pt}_{17}(\text{CO})_{12}(\text{PPh}_3)_8$  comprises positively charged  $[\text{Pt}_{17}(\text{CO})_{12}(\text{PPh}_3)_8]^+$  and  $[\text{Pt}_{17}(\text{CO})_{12}(\text{PPh}_3)_8]^{2+}$ , having a geometric structure similar to that<sup>36</sup> of neutral  $\text{Pt}_{17}(\text{CO})_{12}(\text{PEt}_3)_8$ . The optical absorption spectroscopy and electrochemical measurements of  $[\text{Pt}_{17}(\text{CO})_{12}(\text{PPh}_3)_8][(\text{SbF}_6)_n]$  ( $n = 1, 2$ ) demonstrated that  $[\text{Pt}_{17}(\text{CO})_{12}(\text{PPh}_3)_8][(\text{SbF}_6)_n]$  ( $n = 1, 2$ ) has a discrete electronic structure. Furthermore, the emission spectroscopy revealed that  $[\text{Pt}_{17}(\text{CO})_{12}(\text{PPh}_3)_8][(\text{SbF}_6)_n]$  ( $n = 1, 2$ ) exhibits photoluminescence in the near-infrared region.<sup>1</sup> In this presentation, I also talk about our recent results on the precise synthesis and one-dimensional structures of alloy clusters including Pt element.

### References

1) L. V. Nair, Y. Negishi, W. Kurashige, et al., J. Phys. Chem. C., **2017**, in press.

## Biography (个人简介)



**Prof. Yuichi NEGISHI** received his bachelor degree in 1996 and PhD degree in 2001 from the Keio University (Japan). He joined the Keio University as an assistant professor in 1998, and worked as an assistant professor at the Institute for Molecular Science (Japan) during the period of 2000-2008. In 2008, he moved to the University of Science in Tokyo (Japan) as a junior associate professor, and was got promoted to associate professor in 2013. After four years, he was promoted to full professor at the University of Science in Tokyo. Prof. Negishi has received many academic awards including PCCP Prize for Outstanding Achievement of Young Chemists in Physical Chemistry and Chemical Physics (Royal Society of Chemistry) in 2007, the Chemical Society of Japan Award for Young Chemists (Japan Chemical Society) in 2008, Japan Society for Molecular Science Award for Young Scientists (Japan Society for Molecular Science) in 2012, and Yagami Prize (Keio University) in 2017. Prof. Negishi's research interests focus on the controllable design of metal nanoclusters and their applications. Currently, he has published over 150 papers in top journals such as *J. Am. Chem. Soc. and Angew. Chem. Int. Ed.* with a total citation of 7800+ (total IF of >810).

**Yuichi Negishi 教授**, 先后在日本庆应义塾大学获得学士和博士学位。并于 1998.8-1998.12和2000.4-2000.7期间, 担任庆应大学研究助理。于2000.7-2008.3, 担任日本分子科学研究所的研究助理。2008.4-2017.3, 任日本东京理科大学获得副教授。2017.4-至今, 任日本东京理科大学教授, 2018年3月, 担任东京理科大学研究生院院长及应用化学系主任。Negishi教授研究成果卓著, 获得了一系列学术荣誉如2007年获得PCCP Prize for Outstanding Achievement of Young Chemists in Physical Chemistry and Chemical Physics (Royal Society of Chemistry)、2008年获得 the Chemical Society of Japan Award for Young Chemists (Japan Chemical Society)、2012年获得 Japan Society for Molecular Science Award for Young Scientists (Japan Society for Molecular Science)、2017年获得 Yagami Prize (Keio University)。他的研究兴趣集中于金属团簇化学、金属纳米团簇的可控设计、性质研究及应用。Negishi教授目前在*J. Am. Chem. Soc., Angew. Chem. Int. Ed.*等期刊已发表论文150余篇, 它引7800余次, 总影响因子超过810分。

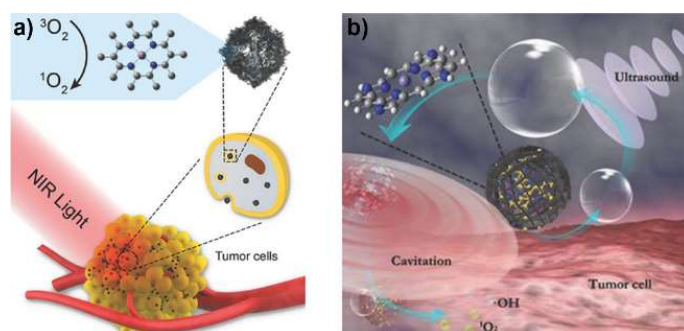
## Carbon nanostructure augmented cancer therap

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Porphyrin and their derivatives are widely used photosensitizers/sonosensitizers, possessing large  $\pi$ -electron conjugated system and excellent catalytic activities. However, those organic photosensitizers or sonosensitizers suffered from poor stability, low water solubility and fast metabolism, which restrict their further applications in biomedicine. To solve this problem, we first developed a metal-organic-framework derived carbon nanostructure with unique metal-centered porphyrin-like structure (named as “PMCS”). Our experiments demonstrated that PMCS has a singlet oxygen ( $^1\text{O}_2$ ) quantum yield comparable to indocyanine green (ICG). In addition, the photothermal conversion efficiency (33.0%) of PMCS is significantly higher than that of currently widely inorganic photothermal agents. Most importantly, density functional theory (DFT) calculations revealed that the high reactive oxygen species production of PMCS is highly dependent on intrinsic porphyrin-like structure of PMCS. Furthermore, PMCS can dramatically enhance the cavitation effect of ultrasound, and we first observed the growth and collapse of cavitation bubbles through a high-speed camera. Those results indicated a great potential of PMCS as inorganic photosensitizers, photothermal agents and sonosensitizers for tumor therapy.



**Fig. 1** Schematic illustration of a) phototherapy and b) sonodynamic cancer therapy of PMCS.

**Keywords:** Carbon Nanostructure; Phototherapy; Sonodynamic Cancer Therapy.

### References:

- [1] Shunhao Wang, Huiyu Liu\* et al. Metal-organic-framework-derived mesoporous carbon nanospheres containing porphyrin-like metal centers for conformal phototherapy. *Adv. Mater.*, 2016, 28, 8379-8387.
- [2] Xueting Pan, Huiyu Liu\* et al. Metal-organic-framework-derived carbon nanostructure augmented sonodynamic cancer therapy. *Adv. Mater.*, 2018, 30, 1800180.
- [3] Yanyan Hu, Huiyu Liu\* et al. A comparative study of clinical intervention and interventional photothermal therapy for pancreatic cancer. *Adv. Mater.*, 2017, 29, 1700448.

## Biography (个人简介)



**Dr. Huiyu LIU**, awardee of the National Science Fund for Excellent Young Scholars, is currently a professor at Beijing University of Chemical Technology. She received her Ph.D. from the Technical Institute of Physics and Chemistry (TIPC), the Chinese Academy of Sciences (CAS), in 2007. Thereafter, she work as an associate professor at TIPC. Dr. Liu moved to the current position in December 2015. Her research mainly focuses on nanomedicine and nanobiology, including the safe design of smart nanoparticle-based platforms for cancer therapy and the characterization and understanding of the biological effects of nanomaterials, with important implications in human health. Her most works have been published in international TOP journals, including *Angew. Chem. Int. Ed.*, *Adv. Mater.*, *ACS Nano*. Until now, she has published **70+** papers with total citation of over 3700 and H-index of 29 (Google Scholar statistics).

**刘惠玉 教授**, 国家优秀青年科学基金获得者, 现为北京化工大学教授。她在2007年获得中国科学院理化技术研究所博士学位, 并留所担任副教授。于2015年12月任北京化工大学教授。她的研究领域为生物医药工程, 研究兴趣集中在光热纳米生物材料制备基础与结构调控、合成反应器设计与过程放大、临床前生物安全性评估、抗癌诊治等健康工程应用。在*Angew. Chem. Int. Ed.*, *Adv. Mater.*, *ACS Nano*等国际期刊发表论文70余篇, 影响因子10以上的论文共14篇, ESI高被引论文6篇, 总引用3700余次, H指数=29。

## **Nanomaterials induced Endothelial Leakiness (NanoEL)**

David LEONG

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The study of how nanoparticles interact with cells is important because this nanobiology governs our future design of nanoparticles especially those where nanoparticles are intentionally introduced as nanomedicine or through exposures to these nanoparticles through consumer products use. While there are many cell types in the body, the likely classes of cells for many nanoparticles are endothelial cells as they fundamentally form our vascular network. We first discovered that nanoparticles could bring about gaps in an otherwise well connected monolayer of endothelial cells. These gaps are so large (of about around 500-1000 fold increase in width) after exposure to nanoparticles and are large enough for whole cells to migrate across. We first coined this phenomenon as nanomaterials induced endothelial cell leakiness (NanoEL). While we cannot control the infamous EPR effect as it is induced by the tumors themselves, we can control endothelial permeability with NanoEL. Since our first discovery of NanoEL, we have systematically shown that density, size and charge windows of the nanoparticles determine the incidence or absence of NanoEL on endothelial cells. Recently, we have shown that uncontrolled NanoEL can increase both intravasation and extravasation of tumor cells in vitro and in vivo. This talk would also discussed about our further efforts and ideas in controlling NanoEL for nanomedicine applications whilst avoiding pathological NanoEL.



## Biography (个人简介)



**Prof. David LEONG** is an Associate Professor of Chemical Engineering at National University of Singapore (NUS). He graduated with a PhD in biology and a Bachelor of Chemical Engineering both from NUS and he did his postdoctoral training in the Howard Hughes Medical Institute and University of Pennsylvania Medical School. He has published >100 peer-review scientific papers in many diverse nanosciences, materials and chemistry journals like *Nat. Commun.*, *Chem. Soc. Rev.*, *ACS Nano*, *Adv. Funct. Mater.*. He has 100+ publications, 6300+ citations, an H-index of 46. His research interests include noble metal nanoclusters, nanomedicine, and applied environmental nanotechnology. He has received several prestigious awards like the Lee Kuan Yew Fellowship and the The International Chemical Congress of Pacific Basin Societies 2015 Sustainable Nanotechnology Young Investigator Award.

**David Leong 教授**, 1998年在新加坡国立大学化学工程专业获得学士学位, 2006在新加坡国立大学获得生物学博士学位。先后在新加坡癌症科学研究院和美国宾夕法尼亚大学从事博士后研究, 于2010年加入NUS。**Leong**教授的研究兴趣集中于纳米材料的生物效应及纳米毒理学、细胞及生物工程、癌症生物学等。目前已在*Nat. Commun.*, *Chem. Soc. Rev.*, *ACS Nano*, *Adv. Funct. Mater.*等期刊发表论文100余篇, 他引6300多次, H指数为46。

## Hydride doping to chemically-modified gold-based superatoms

Tatsuya TSUKUDA

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### Biography (个人简介)



**Prof. Tatsuya TSUKUDA** received his B.S. (1989), M.S. (1991), and Ph.D. (1994) degrees from the University of Tokyo. He worked as an assistant professor at the University of Tokyo in the period of 1994-1999, an associate professor at the Institute of Molecular Science in Japan in 2000-2007, and a professor at the Center for Catalytic Research at the University of Hokkaido in 2007-2011. In 2011, he moved to the Department of Chemistry at the University of Tokyo. Prof. Tsukuda is one of pioneers in the field of noble metal nanoclusters, and has won many Honors such as Inoue Research Aid for Young Scientists (1995), Best Presentation Award (GOLD2006), and the CSJ Award for Creative Work (by Chemical Society of Japan in 2009). Currently, his research interests focus on the precise synthesis and characterization of metal clusters, and the design of nanocluster based catalysts. Prof. Tsukuda has published more than 120 papers in top journals such as *J. Am. Chem. Soc.* and *Acc. Chem. Res.* with a total citation of 12000+.

**Tatsuya Tsukuda 教授**, 先后在东京大学获得学士（1989）、硕士（1991）和博士（1994）学位。1994-1999年以助理教授身份就职于东京大学，2000-2007年被聘为日本分子科学研究所副教授，2007-2011年在北海道大学催化研究中心获聘教授。2011年至今，任东京大学化学系教授。Tsukuda教授在团簇领域声誉卓著，获得诸多荣誉如Inoue Research Aid for Young Scientists (1995)、 Best Presentation Award (GOLD2006)、the CSJ Award for Creative Work (by Chemical Society of Japan in 2009) 等等。Tsukuda教授的研究兴趣集中于金属团簇基催化剂的精确合成及表征、团簇基催化剂活性及电子结构、纳米团簇超分子设计。 Tsukuda教授在纳米团簇催化领域造诣深厚，至今在*J. Am. Chem. Soc.*、 *Acc. Chem. Res.*等期刊发表论文120余篇，它引12000余次。

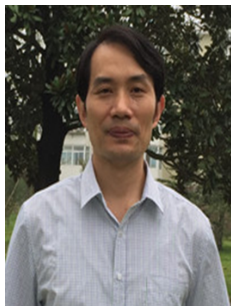
## Unravelling the long-pursued Au<sub>144</sub> structure by X-ray crystallography

Zhikun WU

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### Biography (个人简介)



**Prof. Zhikun WU** is Chinese Academy of Science as the preeminent “Hundred Talent Program” candidate, “Science Fund for National Distinguished Young Scholars”. He received his doctoral degree in chemistry from the Chinese academy of sciences in 2004, and then worked as a postdoctoral researcher in the University of Tokyo in Japan and Carnegie Mellon University in the United States. In September 2010, he joined institute of solid physics, Chinpese academy of sciences. His research interests focus on the controllable synthesis, structure characterization and properties of precious metal nanoclusters. Until now, he has published 60+ papers in international journals such as *Nat.Commun.*, *J Am. Chem. Soc.*, *Angew. Chem. Int. Ed.*, *Nano Lett.*, *ACS Nano*.

**伍志鲲** 研究员，中科院合肥物质科学研究院，中国科学院“百人计划”择优获得者，国家优青基金获得者。2004年于中科院化学所获博士学位后，先后在日本东京大学和美国卡耐基-梅隆等大学从事博士后研究。2010年9月加入中科院固体物理所。课题组的研究兴趣集中于贵金属纳米团簇的可控合成、结构表征、及性能研究。在*Nat. Commun.*, *J.Am.Chem Soc.*, *Angew. Chem.Int. Ed.*, *Nano Lett.*, *ACS Nano*等国际期刊上发表论文六十余篇，目前承担的研究课题包括中科院百人计划，国家自然科学基金优秀青年基金，面上项目等。

## Employing self-assembly for biomedical imaging applications

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Employing the property that self-assembly of probes can enhance imaging signals, we have conducted sensitive analyses on several important biomarker-instructed self-assembly processes. 1) By rational design of a system of one enzyme (alkaline phosphatase) two substrates, for the first time, we have successfully used chemiluminescence imaging to precisely analyze the simultaneous enzyme-instructed self-assembly process. 2) Using cryo transmission electron microscopy imaging analysis, we have differentiated several nanofibers which were obtained from different biomolecule-instructed self-assemblies at angstrom scale. 3) By designing small molecular probe (or drug), we have conducted real time fluorescence imaging (or magnetic resonance imaging, etc) analyses on the intracellular enzyme-instructed self-assembling processes of nanoprobos (or drugs).

## Biography (个人简介)



**Prof. Gaolin LIANG**, born in the September 15<sup>th</sup> of 1972 at Xinghua city of Jiangsu province. He is a full professor (doctoral supervisor) at the University of Science and Technology of China (USTC) and the awardee of the “Science Fund for National Distinguished Young Scholars” (2017). In 1989, he was admitted to the Department of Intensive Instruction of Nanjing University and received his B.S. degree of physical chemistry in 1993. He received his M.S. degree of chemical technology from Zhengzhou University in 2002, and his Ph.D. degree of medicinal chemistry from Fudan University in 2005. From 1993 to 2002, he was employed as an associate researcher in Jiangsu Institute of Nuclear Medicine. From September 2005 to January 2008, he was a postdoctoral fellow at the Department of chemistry of Hong Kong University of Science and Technology under the supervision of Professor Bing Xu. From January 2008 to May 2010, he was a postdoctoral fellow at Stanford University School of Medicine under the supervision of Professor Jianghong Rao. In March 2010, he became a full professor and doctoral supervisor in the Department of Chemistry of USTC. Until now, he has published over 100 SCI papers with >4000 citations and an H-index of 30. Dr. Liang has 1 class II new drug certificate in China, 7 Chinese invention patents, 1 international patent, and 1 USA patent. Till now, Dr. Liang has obtained a series of awards and honours including “Science Fund for National Distinguished Young Scholars” (2017), “100 Talents Program” of Anhui Province (2012), “Science Fund for Distinguished Young Scholars” of Anhui Province (2011), and “New Century Excellent Talents in University” of Ministry of Education of China (2010).

**梁高林 教授**, 1972年9月出生于江苏省兴化市。中国科学技术大学教授(博士生导师), “国家杰出青年基金”获奖者(2017年)。1993年在南京大学获得物理化学专业学士学位, 2002年在郑州大学获得化学工艺专业硕士学位, 2005年在复旦大学获得药物化学专业博士学位。从1993年至2002年, 任江苏原子医学研究所副研究员。2005年9月至2008年1月, 香港科技大学化学系博士后, 导师徐兵教授。2008年1月至2010年5月, 美国斯坦福大学医学院博士后, 导师饶江宏教授。2010年3月, 受聘为中国科学技术大学化学系教授、博士生导师。迄今为止, 在SCI收录期刊上发表论文100余篇, 论文它引>4000, H指数为30。梁教授获得国家二类新药证书1项、国家专利7项、世界专利1项、美国专利1项、“国家优秀青年学者科学基金”(2017年)、安徽省“100项人才计划”(2012年)、“杰出青年学者科学基金”等一系列奖项和荣誉。安徽省(2011), 教育部“大学新世纪优秀人才”(2010)。

## 四、展商介绍

本次“中-日-新金属纳米团簇及生物材料研讨会”，感谢青岛安世科学仪器有限公司、大龙兴创实验仪器（北京）有限公司、青岛硕安达科贸有限公司、中国医药对外贸易有限公司的特约赞助。

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国药外贸主营医药及相关产品的国际贸易和实业投资，提供医药产品进出口、市场营销及保税物流、信息咨询等多项增值服务。面向中国市场，公司建立药品、医疗器械、药房自动化设备、医药化工产品、大健康产品五大业务板块，通过遍布全国各地的医药经销网络和具有丰富营销经验的销售团队帮助供应商覆盖中国市场。面向海外市场，公司致力于以医药制剂产品为主的中国医药产品的出口和海外销售服务，目前已取得数百个原料药、化学制剂和生物制品的海外注册证。



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