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提纲

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02 BEGELL 产品介绍

03 BEGELL 特色资源

01

BEGELL 出版社介绍

BEGELL HOUSE出版社由WILLIAM BEGELL 博士于1991年在美国创办。

WILLIAM BEGELL博士（1927-2009）是一位在化学工程等方面享有盛名的工程师和科学家，精通英语、德语、俄语，对工程和生物医学的发展趋势有着敏锐的洞察力。曾在哥伦比亚大学任教。

2005年，被授予“美国机械工程师协会热交换分会杰出贡献奖”。

威廉• 伯格奖（The William Begell Medal），国际传热界最高奖项，由国际传热传质中心（ICHMT）执行委员会、国际传热大会理事会（AIHTC）及Begell House出版社共同设立。

威廉•伯格奖因其严格的评选程序和重要分量，被视为传热学界的“终身成就奖”。

每4年颁发1次，每次全球仅选出1名。

2014 International Heat Transfer Conference 15

清华大学：刘静

Ways Toward Targeted Freezing Or Heating Ablation Of Malignant Tumor: Precisely Managing The Heat Delivery Inside Biological Systems.

2023 International Heat Transfer Conference 17

上海交通大学：赵长颖

For his lifetime achievements in and contributions to the field of thermal sciences and engineering

清华大学新闻网

清华大学刘静教授获得国际传热界威廉•伯格奖

清华新闻网8月20日电 近日，在日本京都国际会议中心举行的2014国际传热大会上，清华大学刘静教授获得国际传热界最高奖项之一：威廉•伯格奖（The William Begell Medal），他并以“通向恶性肿瘤靶向冷冻或热消融治疗的途径：生物体系内热量的精准输运”为题作了45分钟大会主题报告。这是中国科学家首次获得国际传热界最高奖项和荣誉。

图为刘静教授从Begell House副总裁Vivian Wang女士手中接过威廉•伯格奖牌。

02

BEGELL 内容介绍

Begell Digital Library 内容特点

1. Begell House出版社是一家独立的学术出版机构，提供工程技术与生物医药科学应用方面最新的研究成果及相关信息。

2. BDL收录期刊全文没有被其他数据库收录。

3. BDL期刊被国际权威检索机构SCI、EI、Pubmed、Scopus等收录。

4. BDL在美国非常受欢迎，有百余所高校和机构使用。

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工程研究选集
31本电子期刊
15本电子书
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4个数据数据库

生物研究选集
18本电子期刊

BDL数字图书馆
47种电子期刊
15本电子书
4个数据库
4个会议录和参考文献资料

IHTC会议录
Begell House 是IHTC独家出版机构。

Begell 电子书
Begell 电子书籍平台为您提供130本早至 90年代的现代和经典书籍，总页数超过十万余页，由同行审阅的数个专辑组成。

HEDH手册
热交换机设计手册：热交换机设计及相关技术上的全球标准参考资源；超过8000个技术术语，视觉导航树状图

环境工程
传热
热物理
核科学
能源
材料
生物医学
电磁
航空航天

03

BEGELL 特色资源介绍

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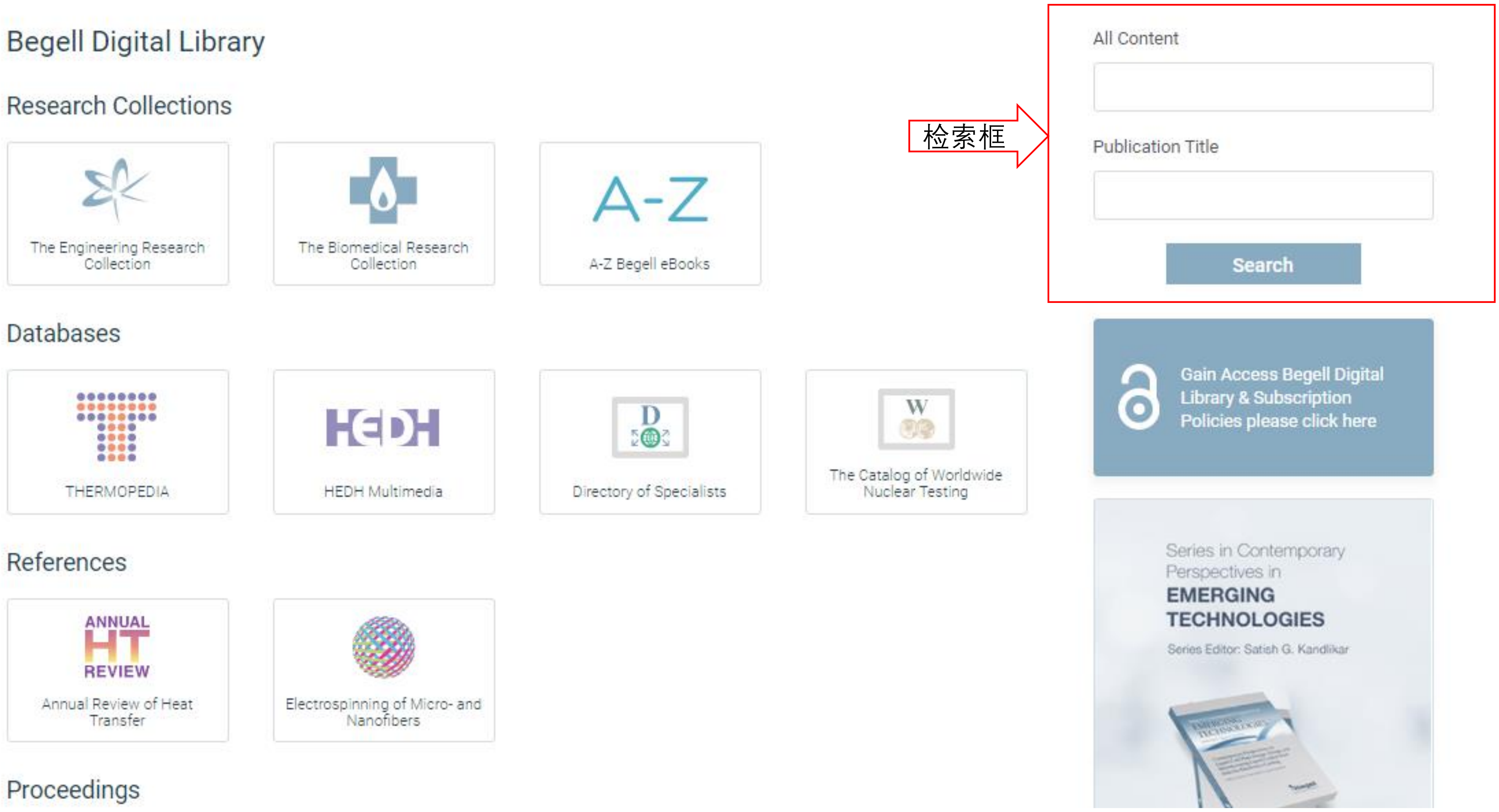
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The Biomedical Research Collection
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HEDH
HEDH Multimedia
D
Directory of Specialists
W
The Catalog of Worldwide Nuclear Testing
References
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Annual Review of Heat Transfer
Electrospinning of Micro- and Nanofibers
Proceedings
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Series in Contemporary Perspectives in
EMERGING TECHNOLOGIES
Series Editor: Satish G. Kandlikar

BDL工程研究选集

学科范围：

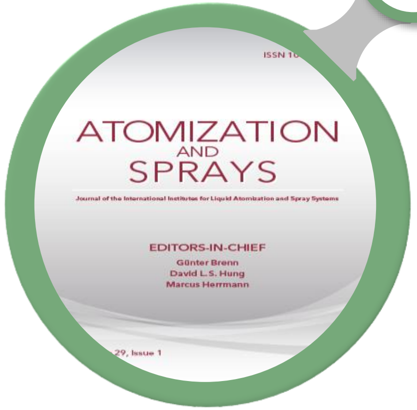
涉及热能工程、纳米、能源、环境、核科学、动力工程、材料、无线电通讯等学科，汇集了30多年来热能与流体科学领域最先进的理论和工程应用研究成果。

资源类型：

- 31种期刊全文
- 15种电子书
- 4个数据资料库
- 4种会议录和参考文献资料

BEGELL 特色期刊

01



雾化与喷雾
IF：1.864

唯一一本收录雾化和喷雾所有相关科技领域的同行评审期刊。

亚洲主编： David Hung
上海交通大学

02

合成材料：力学、计算和应用

俄国及东欧国家的期刊原文&英文原版文章；

随着纳米科技的发展，材料学变得愈发重要。合成材料在材料学领域的地位更是关键！

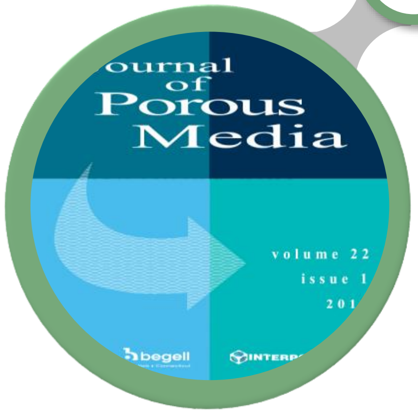
03

传热研究
IF：2.443

ASME（美国机械工程师学会）赞助；翻译俄罗斯、乌克兰和白俄罗斯等国家知名期刊

咨询委员会：
Ping Chen （上海交通大学）
陶文泉（西安交通大学）

04



多孔介质期刊
IF：1.782

唯一出版多孔介质研究涉及的广泛领域内的评论和 专题研究的期刊。

编辑：
GONGNAN XIE （西北工业大学）
Ping Chen （上海交通大学）

- 中文名称：

  《 传热研究》

- 出版物介绍：

  由ASME（美国机械工程师学会）的传热研究机构赞助，期刊翻译了俄罗斯、乌克兰和白俄罗斯期刊、会议录和实验报告中挑选出的重大技术和实验论文，涵盖了整个传热流域，如传导、对流、辐射、沸腾现象、换热器设计和测试、核反应堆的热转移、传质、地热回收等领域。

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Home > Journals > Heat Transfer Research

Heat Transfer Research

Editors-in-Chief: Yong X. Tao, Oleg Penyazkov

Founding Editors: James P. Hartnett, T. F. Irvine, Jr., Oleg G. Martynenko

Managing Editor: N.K. Shveyeva

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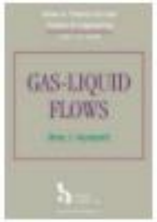
Contemporary Perspectives on Flow Boiling Instabilities in Microchannels and Minichannels

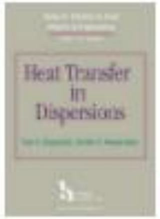
Contemporary Perspectives on Liquid Cold Plate Design: Design and Manufacturing Liquid Cooled Heat Sinks for Electronics Cooling

Energy and Process Integration

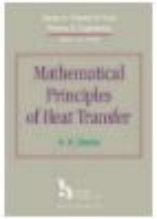


Gas-Liquid Flows

Heat Transfer and Fluid Flow in Microchannels



Heat Transfer in Dispersions



Mathematical Principles of Heat Transfer

Practical Heat Transfer

Practical Thermal Design of Air-Cooled Heat Exchangers

Practical Thermal Design of Shell-and-Tube Heat Exchangers

Radiative Transfer in Combustion Systems: Fundamentals and Applications

Thermal Radiation Fundamentals

Thermophysical Properties of Pure Fluids and Aqueous Systems at High Temperatures and High Pressures

Validation of Advanced Computational Methods for Multiphase Flow

BDL工程包在线数据库

1. Thermopedia™ （热百科）热百科™

2. The Catalog of Worldwide Nuclear Testing （全球核试验目录）

3. Worldwide Directory of Specialists in Thermal & Fluids Science and Engineering（热流体科学与工程全球专家索引）

4. Heat Exchanger Design Handbook（HEDH）(换热器设计手册)

三大主要功能：视觉导览树状图、A-Z主题词索引、动态影像

THERMOPEDIA

所有内容 | 图书馆订阅: CEPIEC

A-Z 索引 作者/编辑 语义地图 视觉画廊 贡献

热力学、传热学、流体科学与技术领域中最值得信赖的知识来源

所有内容

搜索传热传质、流体流动、流体力学与能源的相关信息

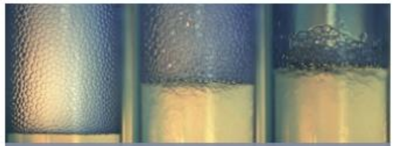
THA 重点

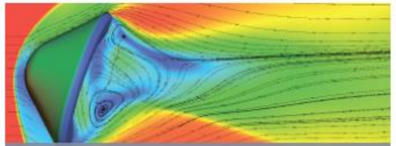
了解基于热力学、传热和流体力学基础知识的应用热流体的新颖研究、创新和突破。

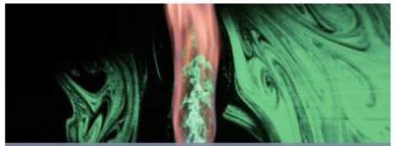
THA 重点
“通过 Thermopedia 学习和启发”

THA 重点 ⟶

基础科学与工程


相变传热传质


航空航天工程中的传热


燃烧系统中的换热

应用工程与技术


可再生能源


建筑节能技术


储能电池

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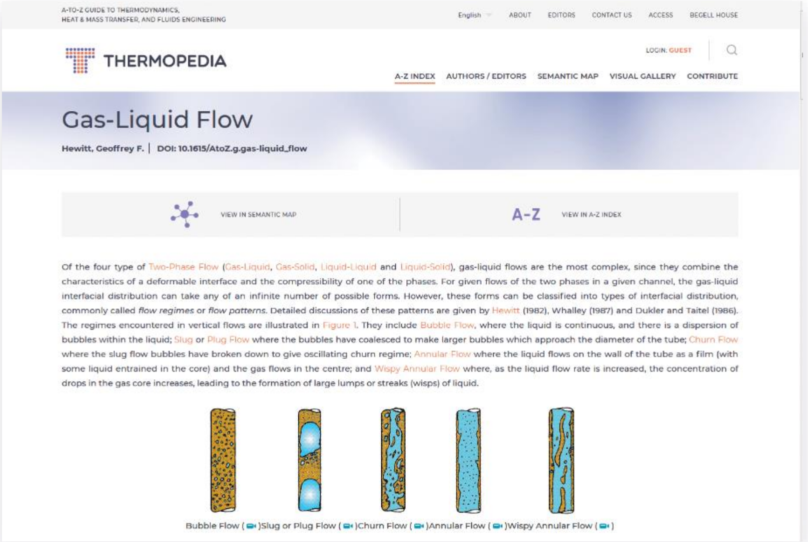

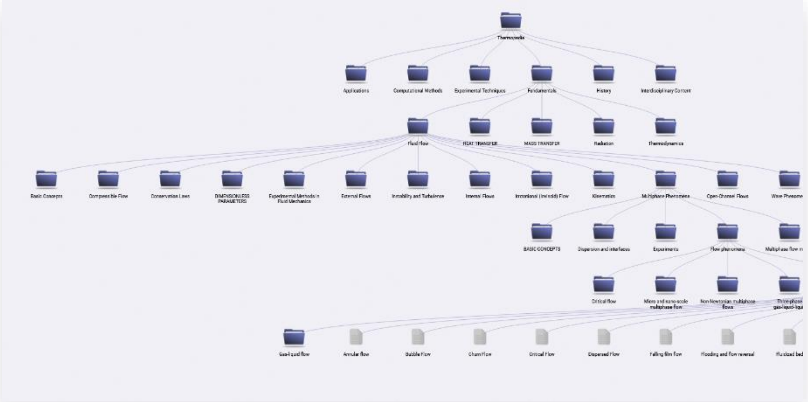

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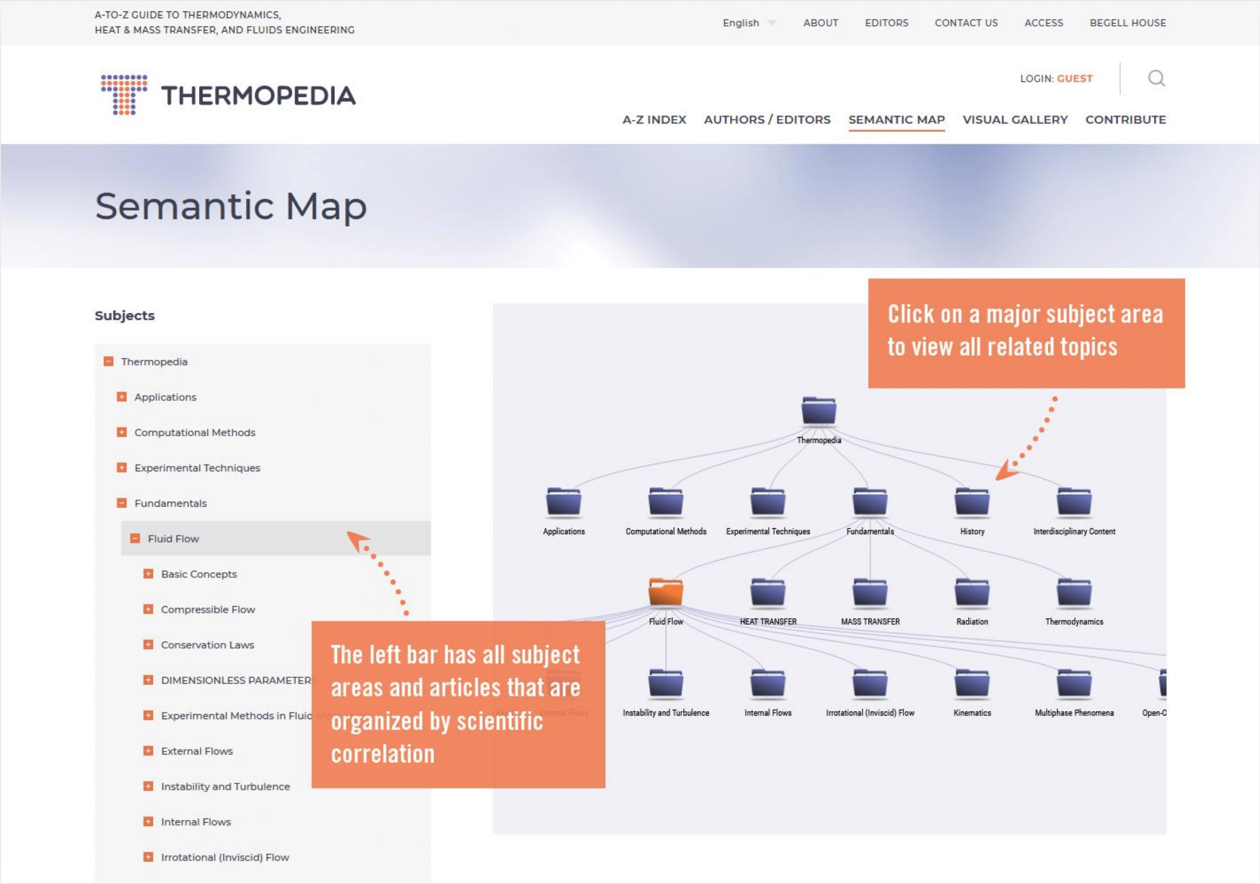
通过Semantic Map or the A-Z index检索主题

很容易看到所有主题的关联性



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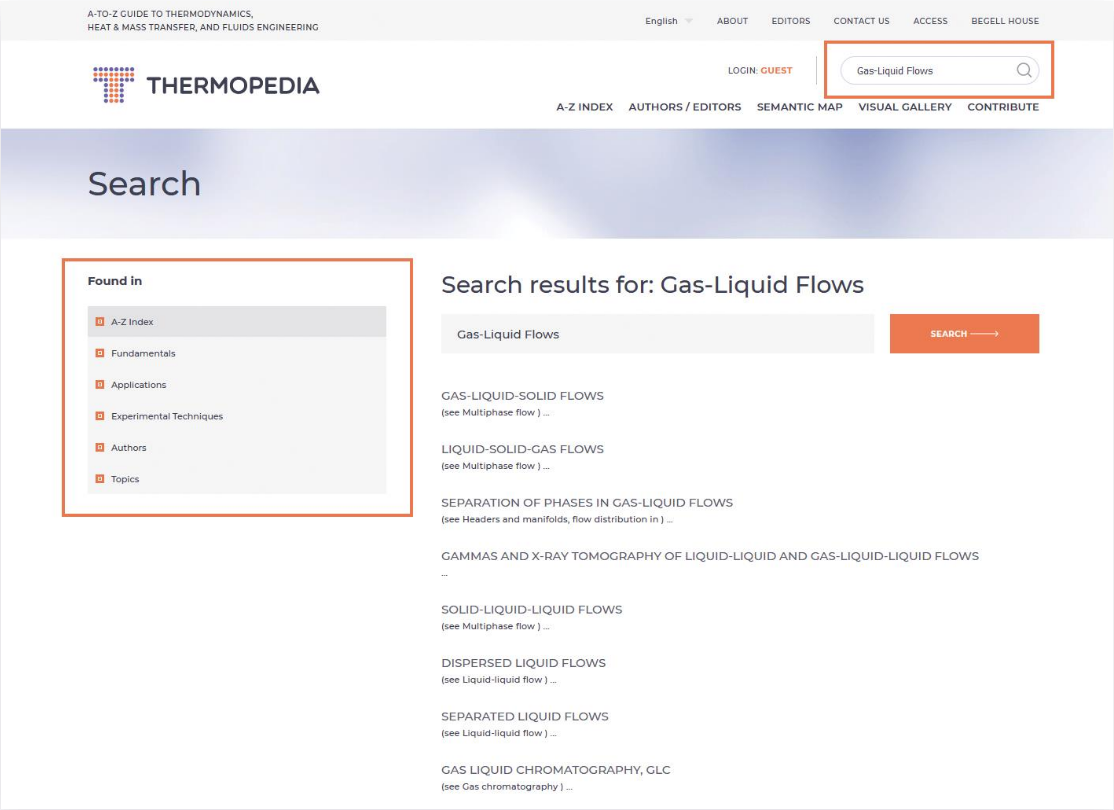

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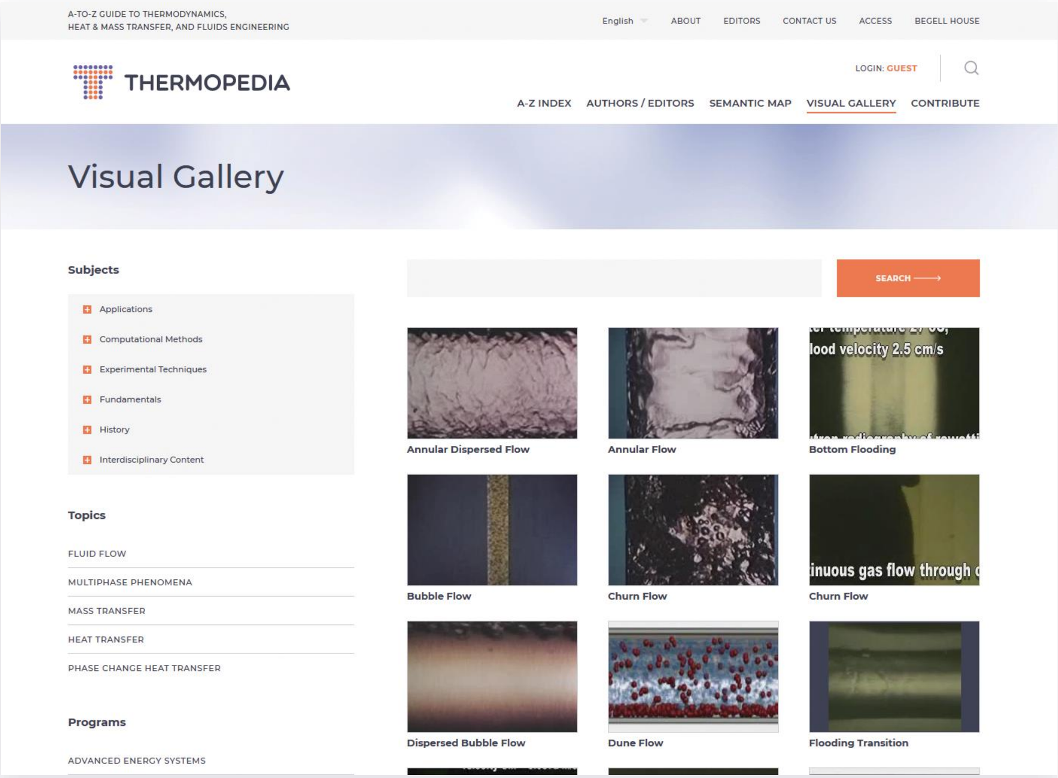
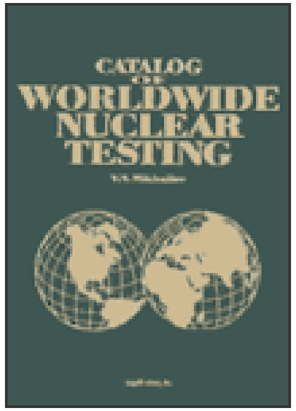
在可视化图库中分析不同类型的流体流动和传热传质



VOLUME UP: 大多数视频都有声音，并有对过程和操作的详细描述

The Catalog of Worldwide Nuclear Testing （全球核试验目录）



由前俄罗斯原子能部长Victor Mikhailov主编，包括美国、前苏联、英国、法国、中国实施的超过2000次核实验的各方面的重要信息和数据，还包括了最近印度和巴基斯坦实施的核实验。被认为是国际上有关领域覆盖最全，最详细的数据收载。

First, Last name: Ya-Ling He

Country: CHINA

Affiliation:

Select Specialization Area:

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Last Name	First Name	Specialisation Area	Country
He	Ya-Ling	Condensation, Conduction, Equations of state, Forced convection, Irreversible thermodynamics, Melting, Multiphase flow modelling, Porous Media	CHINA

Ya-Ling He

Position: Associate Editor of Heat Transfer Research

Institution: Key Laboratory of Thermo-Fluid Science and Engineering, Ministry of Education, School of Energy and Power Engineering, Xi'an Jiaotong University, Xi'an, Shaanxi 710049, China

Department: School of Energy & Power Engineering

E-mail yalinghe@mail.xjtu.edu.cn; yalinahe@xitu.edu.cn

Home page: http://gr.xjtu.edu.cn/web/yalingheen

Address: School of Energy & Power Engineering Xi'an Jiaotong University, Xi'an,Shaanxi ,P.R.China, Shaanxi, CHINA, 710049

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Journals:

HEAT TRANSFER RESEARCH

Zhixiong Guo, Oleg G. Penyazkov, James P. Hartnett, Xinwei Wang, Partha S. Ghoshdastidar, Thomas F. Irvine, Jr., Ya-Ling He, Oleg G. Martynenko, Bengt Sunden, Natalia K. Shveyeva

Articles:

3D NUMERICAL SIMULATION ON LAMINAR HEAT TRANSFER AND FLUID FLOW CHARACTERISTICS OF SLITTED FIN SURFACES-INVESTIGATION OF STRIP LOCATION EFFECT

Ya-Ling He, Wen-Quan Tao, Z.G. Qu
Reference: Compact Heat Exchangers and Enhancement Technology for the Process Industries - 2003 - Vol. 0 '2003

EXPERIMENTAL STUDY ON PRESSURE DROP THROUGH A WOVEN SCREEN SUBJECTED TO AN OSCILLATING FLOW

Ya-Ling He, Wen-Quan Tao
Reference: Compact Heat Exchangers and Enhancement Technology for the Process Industries - 2003 - Vol. 0 '2003

PRINCIPLE OF FIELD COORDINATED ENHANCEMENT OF SINGLE PHASE THERMAL CONVECTION

Zhi-Xin Li, Ya-Ling He, Wen-Quan Tao, Zeng-Yuan Guo
Reference: Compact Heat Exchangers and Enhancement Technology for the Process Industries - 2003 - Vol. 0 '2003

MOLECULAR DYNAMICS SIMULATION OF METHANE ADSORPTION IN SHALE MATRIX

Ya-Ling He, Zhong-zhen Li, Li Chen, Wen-Quan Tao
Reference: First Thermal and Fluids Engineering Summer Conference - Vol. 14 '2015

A GENERALIZED MODEL FOR FLOW THROUGH TIGHT POROUS MEDIA WITH KLINKENBERG'S EFFECT

Ya-Ling He, Q. Kang, Li Chen, Wen-Quan Tao, H.S. Viswanathan
Reference: First Thermal and Fluids Engineering Summer Conference - Vol. 19 '2015

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Thermodynamics and Thermophysical Properties

- Properties of pure substances
- Properties of mixtures
- Nucleation phenomena
- Equilibrium thermodynamics
- Equations of state
- Activity
- Fugacity
- Irreversible thermodynamics
- Non-equilibrium effects
- Metastability
- Metamaterials
- Measurement

Fluid Flow Fundamentals

- Equations of motion
- Closure relationships
- Non-newtonian fluid mechanics
- Gas dynamics
- Shock waves

Phase Change Heat Transfer

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- Condensation
- Melting
- Solidification
- Ablation
- Sublimation
- Flows with phase change

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- Bio fuels
- Thermodynamics of Combustion
- Adiabatic flame temperature
- Soot formation and properties
- Ignition
- Diagnostics

Porous Media

Energetic Materials and Chemical Propulsion

- Synthesis of energetic materials
- Formulation of energetic materials
- Processing of energetic materials
- Characterization of energetic materials
- Insensitive munitions
- Aging of energetic materials
- Stability of energetic materials
- Recyling and disposal of energetic materials
- Detonation
- Deflagration
- Thermobarics
- Thermites
- Liquid rocket propulsion
- Solid rocket propulsion
- Hybrid rocket propulsion
- Thermal protection materials
- Green propellants

Extreme Temperature Phenomena and Cryogenics

Thermal Sciences in Biomedicine

- Thermal properties of tissues
- Heat and mass transfer in the human body
- Thermal confort
- Thermal therapies
- Thermal protection of animals in nature
- Lasers in biomedicine
- Cooling and preservation
- Bio-hydrodynamics
- Blood flow studies

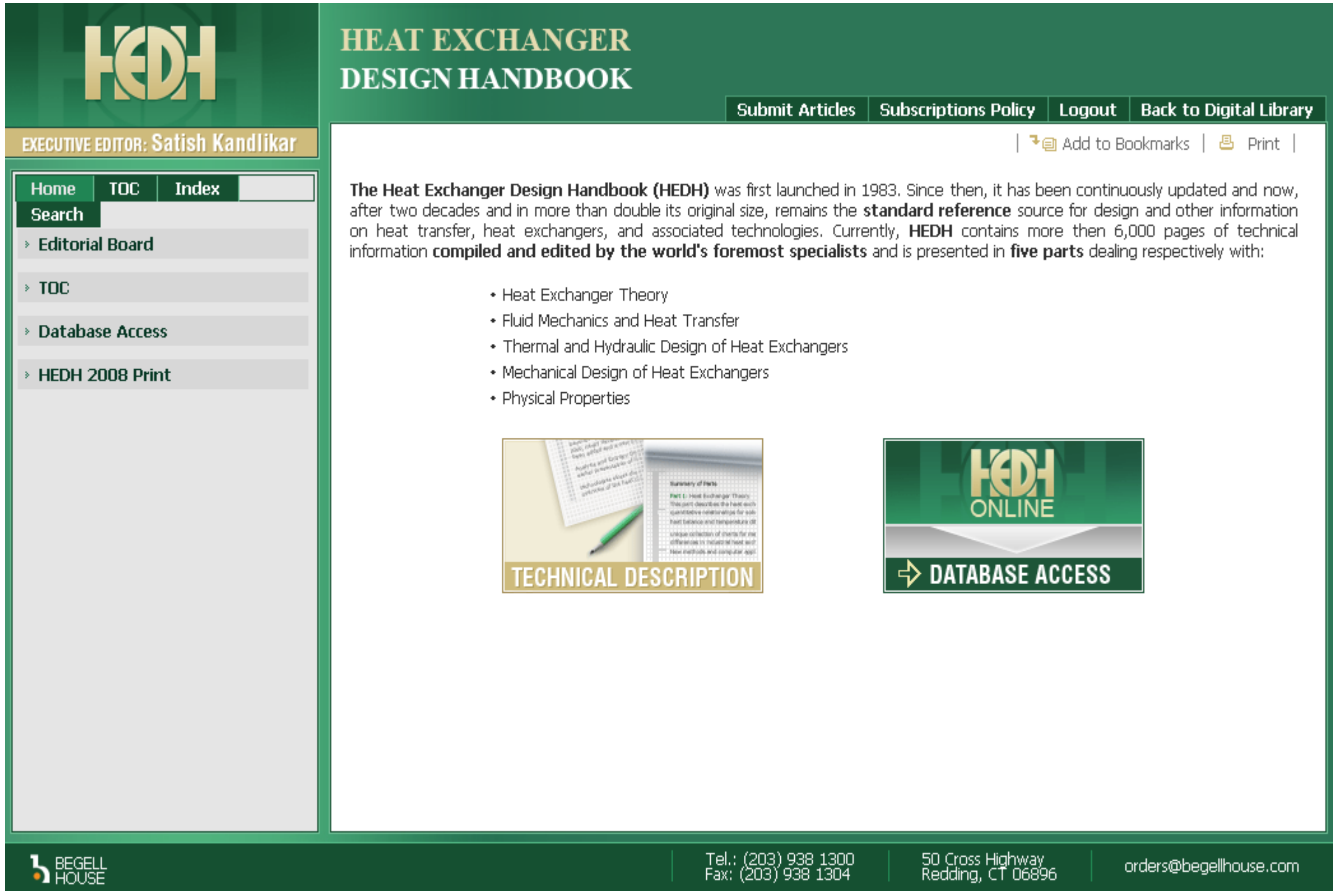
Micro and Nanoscale Thermal Sciences and Engineering

- MEMS
- Heat transfer physics (electrons, phonons etc.)
- NEMS
- Fluid flow and heat transfer in micro and nanochannels

Safety Aspects in Engineering and Thermal Sciences

Select All | Unselect All | Ok

Last Name	First Name	Specialisation Area	Country
Abadie	Marc O.	Green buildings, Thermal pollution	BRAZIL
Abrantes	Juliana Kuhlmann	Heat exchangers	BRAZIL
Alahmed	Nasser	Flow patterns, Multiphase flow modelling, Multiphase flows, Particle technology	BRAZIL
Albuquerque	Margeli	CO2 sequestration, Experimental techniques, Global warming, Turbulence models	BRAZIL



- 中文名称：
  《换热器设计手册》
- 出版物介绍：
  于1983年面世，经过20多年持续不断的更新发展，依然是换热器设计和相关技术的首选参考工具书。内容超过6000页，每季度都会进行同行评审并更新内容。全书共分为5个部分，依次是：
  - 换热器理论研究
  - 流体机械和传热研究
  - 换热器的热力和水压设计
  - 换热器的机械设计
  - 物理特性

1.2.1

Thermodynamics: Brief notes on important concepts

D. Brian Spalding

A. Temperature

For present purposes, temperature is that property of matter, differences of which are cause of heat transfer. It is an intensive property. Its symbol in this book is T, and it is measured in kelvins (K) or degrees Celsius (°C).

B. Specific internal energy

The specific internal energy u of a material is the extensive property which changes as a consequence of heat and work transfers in accordance with the linear relationship

Pressure is here understood as the force that the material exerts on its surroundings, normal to its surface, per unit area of that surface; its units are newtons per square meter (N/m^2). Density is the mass of the material per unit volume; its units are kilograms per cubic meter (kg/m^3).

Specific enthalpy is of particular importance in heat exchanger practice because it enters the steady-flow energy equation

$$\dot{M}\,\Delta\left(h + \frac{v^2}{2} + g_n z\right) = \dot{Q} - \dot{W}_s \qquad (3)$$

where $\dot{M}$ stands for the mass rate of flow (kg/s), Δ again stands for "increase of," $(h + v^2/2 + g_n z)$ is the sum of

BDL工程包参考资料

1. Annals of the Assembly for International Heat Transfer Conference 13---Proceedings（第13届国际传热学会年报）

2. International Centre for Heat and Mass Transfer (ICHMT Digital Library)---Proceedings（国际传热传质会议中心数字图书馆）

3. TSFP DIGITAL LIBRARY ONLINE（湍流和剪切流动现象数字图书馆）

4. Electrospinning of Micro- and Nano-Fibers: Fundamentals in Separations and Filtration Processes （微纳米纤维静电纺丝：分离和过滤过程基础理论）

IHTC国际传热大会——传热界的奥林匹克

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1966, Chicago, USA

IHTC 4
1970, Paris-Versailles, France

IHTC 5
1974, Tokyo, Japan

IHTC 6
1978, Toronto, Canada

IHTC 7
1982, Munich, Germany

IHTC 8
1986, San Francisco, USA

IHTC 9
1990, Jerusalem, Israel

IHTC 10
1994, Brighton, UK

IHTC 11
1998, Kyongju, Korea

IHTC 12
2002, Grenoble, France

IHTC 13
2006, Sydney, Australia

IHTC 15
2014, Kyoto, Japan

IHTC 16
2018, Beijing, China

IHTC 17
2023, Cape Town，South Africa

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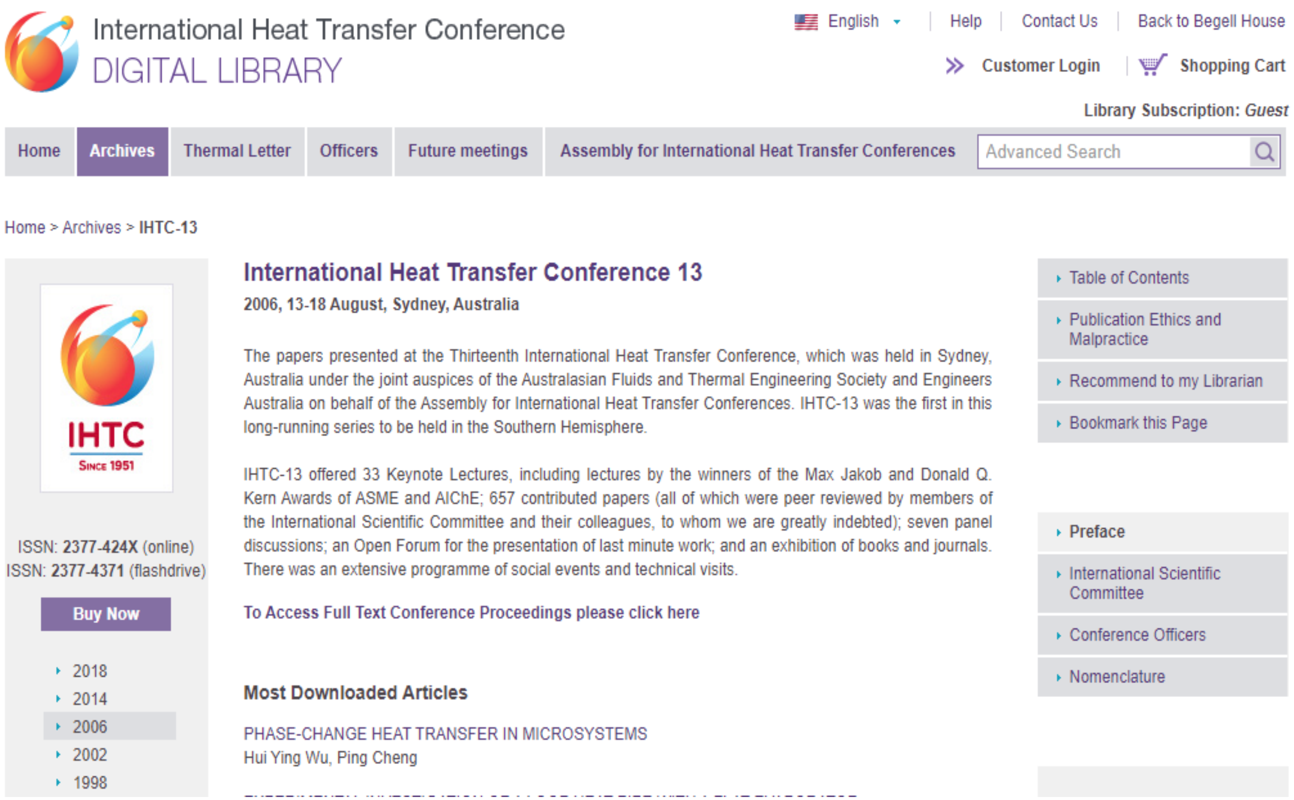
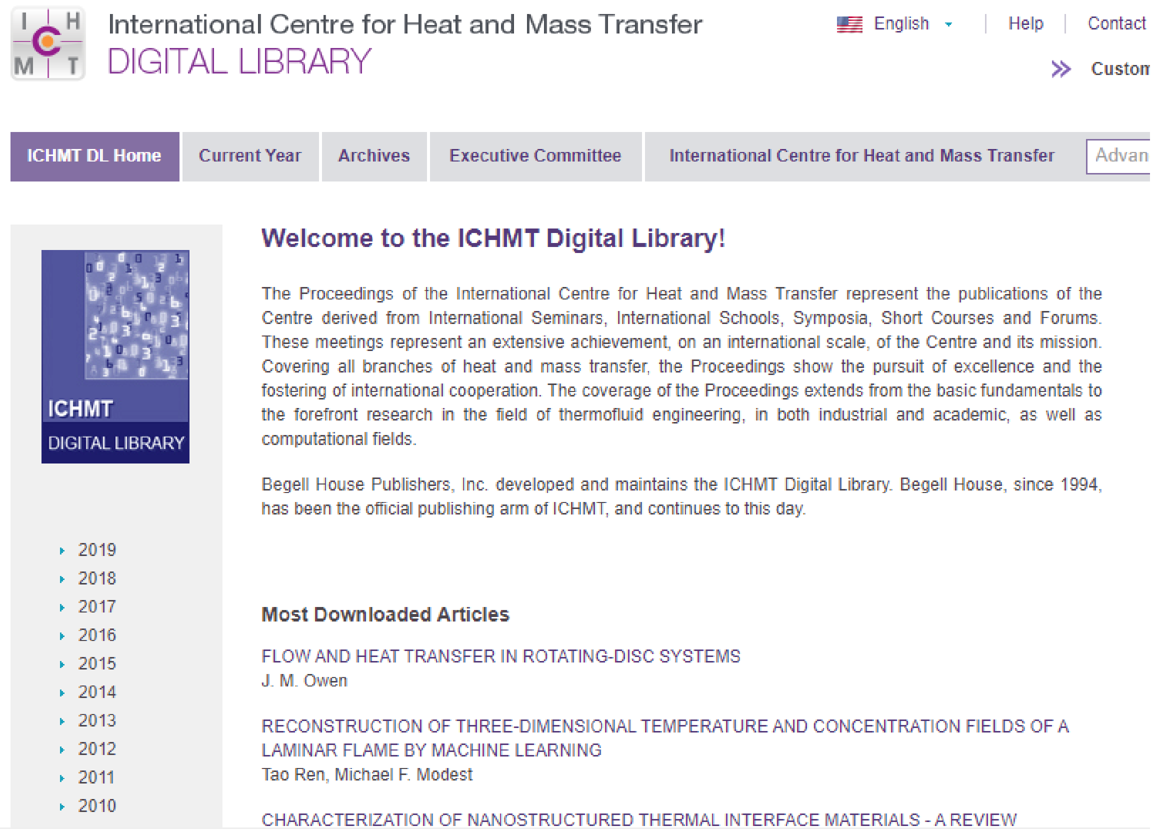
清华新闻网8月22日电 8月10-15日，由中国工程热物理学会传热传质分会主办、清华大学承办的第16届国际传热大会在北京国家会议中心召开，这是该大会成立67年以来首次在中国举办。第十一届全国政协副主席王志珍、第八届国家自然科学基金委员会副主任谢心澄等多位嘉宾，以及来自40多个国家和地区的1400余位学者出席了会议。清华大学校长邱勇在大会开幕式代表承办单位致欢迎辞。



- 中文名称:
  《第13届国际传热大会年报》
- 出版物介绍:
  第十三届国际传热会议（IHTC-13），是2006年8月在悉尼由澳大利亚热流体工程学会和澳大利亚工程师联合举办，55个国家的836名代表出席。大会共收录29个细分学科领域内的657篇会议论文。所有会议论文都经过了国际科学委员会的权威同行评审。



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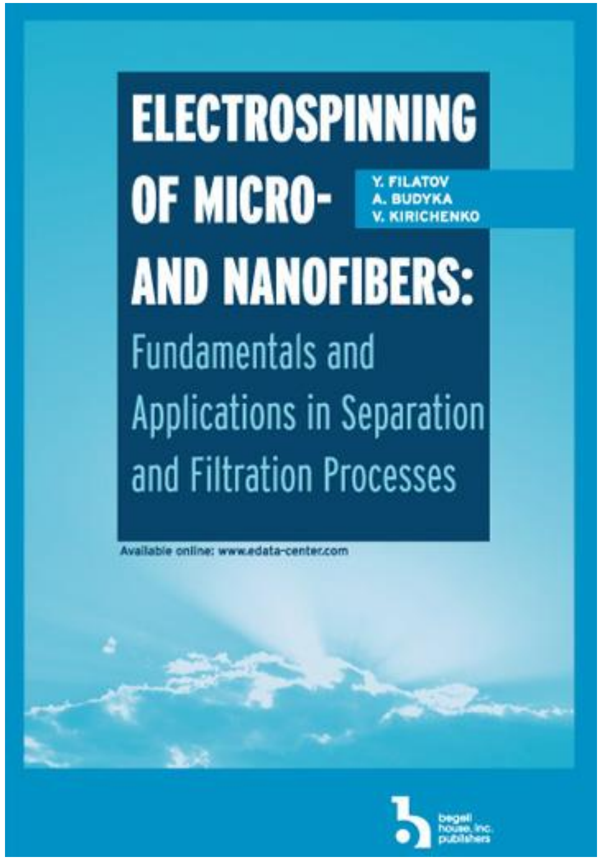
  国际传热传质中心（ICHMT），1968年在南斯拉夫成立，是一家知名的国际学术性组织，目标是在传热传质及其应用领域促进和加强国际间的合作。ICHMT Digital Library收录始于1980年的会议论文集、评论集、论坛等研究数据，涉及热流体工程和计算领域的基础和前沿研究。Begell House 在1994年成为世界上唯一被授权收集所有ICHMT论文的出版社。



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出版物介绍：本书出版于2007年，包含488页。

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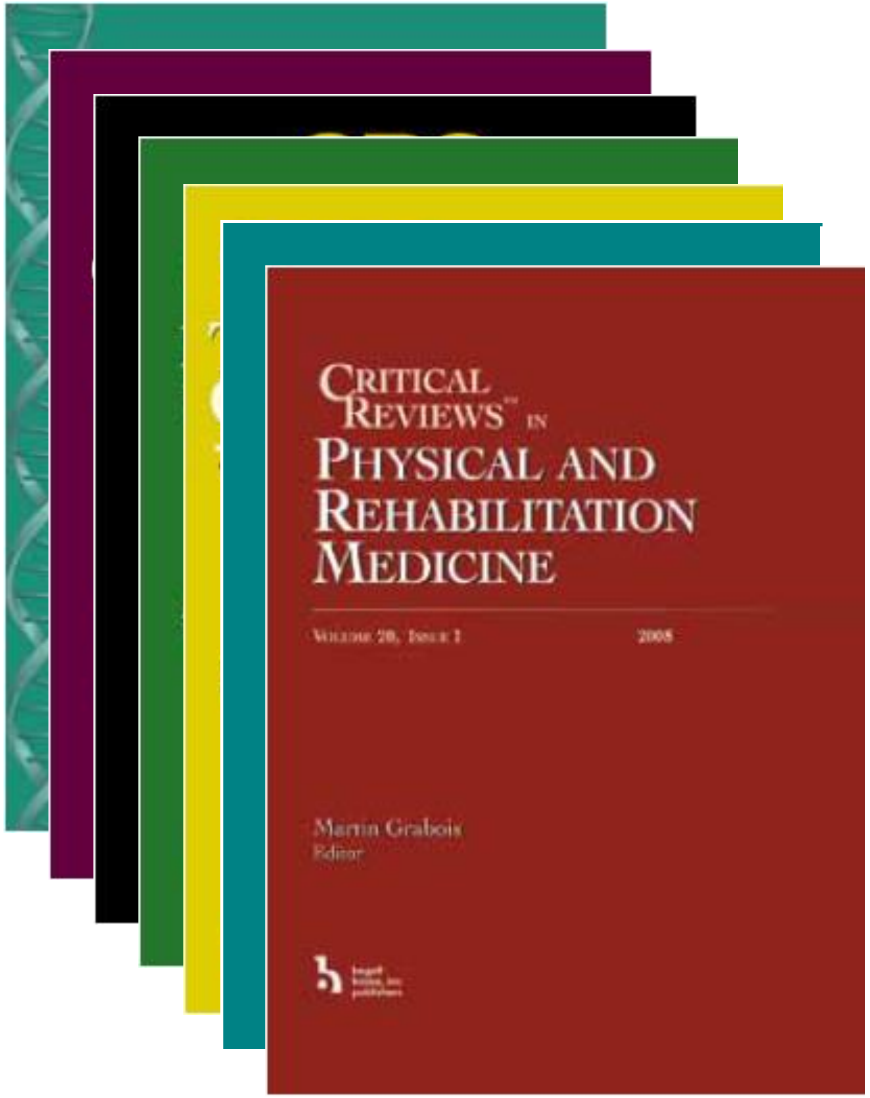

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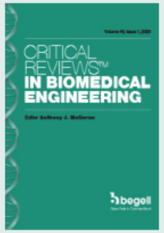

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纳米药物传送系统增强药物到实体瘤：进展和机遇

Critical Reviews™ in Biomedical Engineering, 40(1):21-41 (2012)

Nanoscale Drug Delivery Systems for Enhanced Drug Penetration into Solid Tumors: Current Progress and Opportunities

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I. INTRODUCTION

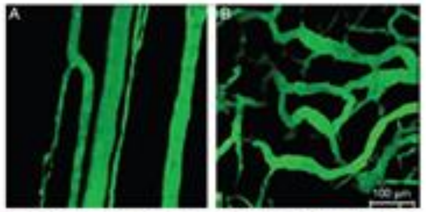
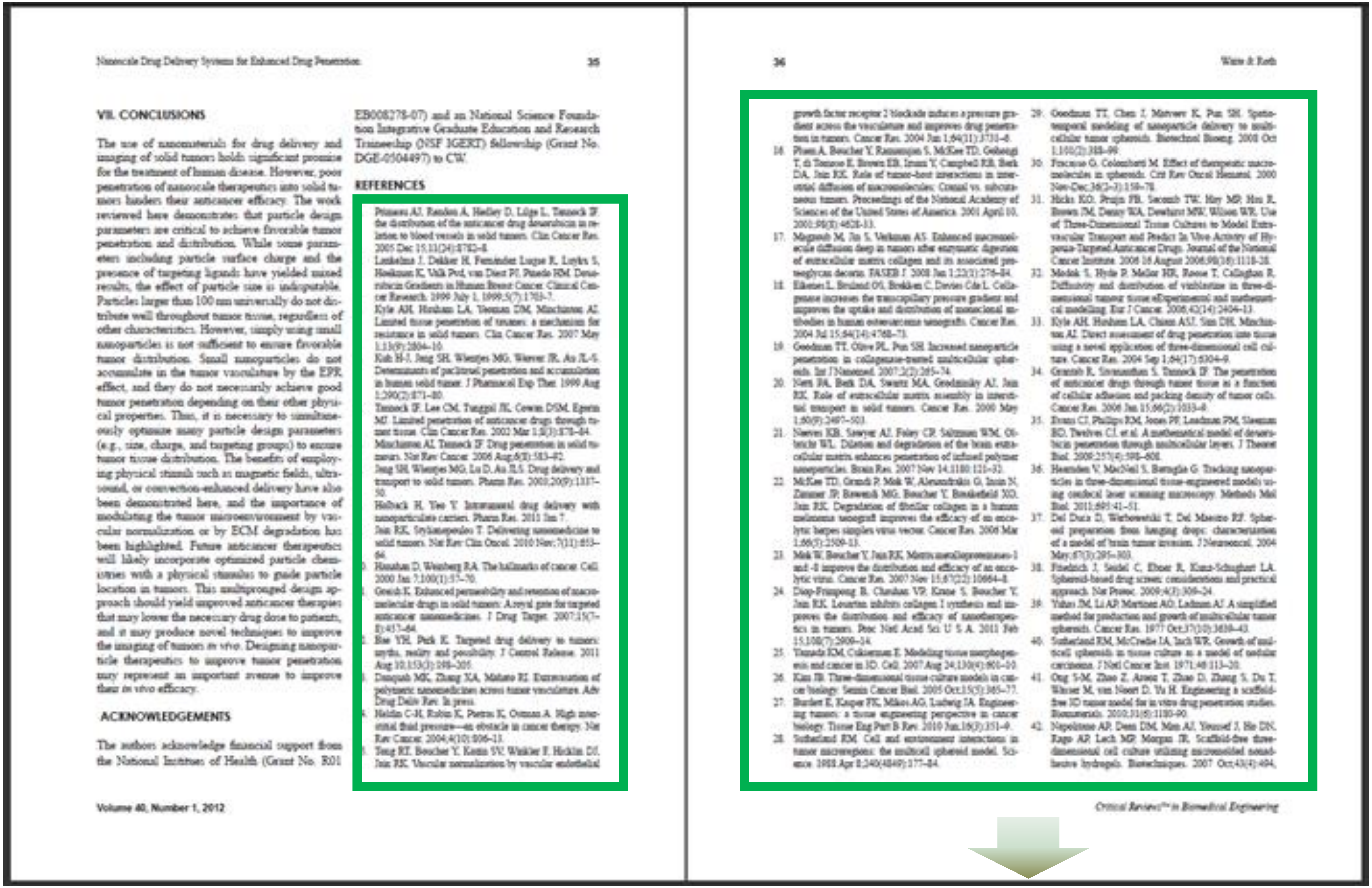


FIGURE 1: Micrographs of normal (A) and tumor (B) vasculature acquired from nude mice bearing tumors from human squamous cell carcinoma cells. This figure was reproduced from Dreher MR et al. with permission from Oxford University Press.

II. TUMOR PROPERTIES HINDERING NANOSCALE DRUG TRANSPORT

A. Abnormal Vasculature



VII. CONCLUSIONS

The use of nanomaterials for drug delivery and imaging of solid tumors holds significant promise for the treatment of human disease. However, poor penetration of nanoscale therapeutics into solid tumors hinders their anticancer efficacy. The work reviewed here demonstrates that particle design parameters are critical to achieve favorable tumor penetration and distribution. While some parameters including particle surface charge and the presence of targeting ligands have yielded mixed results, the effect of particle size is indisputable. Particles larger than 100 nm universally do not distribute well throughout tumor tissue, regardless of other characteristics. However, simply using small nanoparticles is not sufficient to ensure favorable tumor distribution. Small nanoparticles do not accumulate in the tumor vasculature by the EPR effect, and they do not necessarily achieve good tumor penetration depending on their other physical properties. Thus, it is necessary to simultaneously optimize many particle design parameters (e.g., size, charge, and targeting groups) to ensure tumor tissue distribution. The benefits of employing physical stimuli such as magnetic fields, ultrasound, or convection-enhanced delivery have also been demonstrated here, and the importance of modulating the tumor microenvironment by vascular normalization or by ECM degradation has been highlighted. Future anticancer therapeutics will likely incorporate optimized particle chemistries with a physical stimulus to guide particle location in tumors. This multipronged design approach should yield improved anticancer therapies that may lower the necessary drug dose to patients, and it may produce novel techniques to improve the imaging of tumors *in vivo*. Designing nanoparticle therapeutics to improve tumor penetration may represent an important avenue to improve their *in vivo* efficacy.

ACKNOWLEDGEMENTS

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REFERENCES

Primeau AJ, Rendon A, Hedley D, Lilge L, Tannock IF. the distribution of the anticancer drug doxorubicin in relation to blood vessels in solid tumors. Clin Cancer Res. 2005 Dec 15;11(24):8782–8.
Lankelma J, Dekker H, Fernández Luque R, Luykx S, Hoekman K, Valk Pvd, van Diest PJ, Pinedo HM. Doxorubicin Gradients in Human Breast Cancer. Clinical Cancer Research. 1999 July 1, 1999;5(7):1703-7.
Kyle AH, Huxham LA, Yeoman DM, Minchinton AI. Limited tissue penetration of taxanes: a mechanism for resistance in solid tumors. Clin Cancer Res. 2007 May 1;13(9):2804–10.
Kuh H-J, Jang SH, Wientjes MG, Weaver JR, Au JL-S. Determinants of paclitaxel penetration and accumulation in human solid tumor. J Pharmacol Exp Ther. 1999 Aug 1;290(2):871–80.
Tannock IF, Lee CM, Tunggal JK, Cowan DSM, Egorin MJ. Limited penetration of anticancer drugs through tumor tissue. Clin Cancer Res. 2002 Mar 1;8(3):878–84.
Minchinton AI, Tannock IF. Drug penetration in solid tumours. Nat Rev Cancer. 2006 Aug;6(8):583–92.

6-500.

43. Kostarelos K, Emfietzoglou D, Papakostas A, Yang WH, Ballangrud AM, Sgouros G. Engineering lipid vesicles of enhanced intratumoral transport capabilities: correlating liposome characteristics with penetration into human prostate tumor spheroids. J Liposome Res. 2005;15(1–2):15–27.
44. Kostarelos K, Emfietzoglou D, Papakostas A, Yang W-H, Ballangrud Å, Sgouros G. Binding and interstitial penetration of liposomes within avascular tumor spheroids. Int J Cancer. 2004;112(4):713–21.
45. Tsukioka Y, Matsumura Y, Hamaguchi T, Koike H, Moriyasu F, Kakizoe T. Pharmaceutical and biomedical differences between micellar doxorubicin (NK911) and liposomal doxorubicin (Doxil). Jpn J Cancer Res. 2002 Oct;93(10):1145–53.
46. Du J, Lu W-L, Ying X, Liu Y, Du P, Tian W, Men Y, Guo J, Zhang Y, Li R-J, Zhou J, Lou J-N, Wang J-C, Zhang X, Zhang Q. Dual-Targeting Topotecan Liposomes Modified with Tamoxifen and Wheat Germ Agglutinin Significantly Improve Drug Transport across the Blood-Brain Barrier and Survival of Brain Tumor-Bearing Animals. Molecular Pharmaceutics. 2009;6(3):905-17.
47. White CL, Roth CM. PAMAM-RGD conjugates enhance siRNA delivery through a multicellular spheroid model of malignant glioma. Bioconjug Chem. 2009 Oct 21;20(10):1908–16.
48. Oishi M, Nagasaki Y, Nishiyama N, Itaka K, Takagi M, Shimamoto A, Furuichi Y, Kataoka K. Enhanced Growth Inhibition of Hepatic Multicellular Tumor Spheroids by Lactosylated Poly(ethylene glycol)-siRNA Conjugate Formulated in PEGylated Polyplexes. ChemMedChem. 2007;2(9):1290-7.
49. Saleh AF, Aojula H, Arthanari Y, Offerman S, Alkotaji M, Pluen A. Improved Tat-mediated plasmid DNA transfer by fusion to LK15 peptide. J Control Release. 2010;143(2):233–42.
50. Mellor HR, Davies LA, Caspar H, Pringle CR, Hyde SC, Gill DR, Callaghan R. Optimising non-viral gene delivery in a tumour spheroid model. The Journal of Gene Medicine. 2006;8(9):1160-70.
51. Han M, Bae Y, Nishiyama N, Miyata K, Oba M, Kataoka K. Transfection study using multicellular tumor spheroids for screening non-viral polymeric gene vectors with low cytotoxicity and high transfection efficiencies. J Control Release. 2007;121(1–2):38–48.
52. Al-Abd AM, Lee SH, Kim SH, Cha J-H, Park TG, Lee SJ, Kuh H-J. Penetration and efficacy of VEGF siRNA using polyelectrolyte complex micelles in a human solid tumor model in-vitro. Journal of Controlled Release. 2009;137(2):130-5.
53. Grainger SJ, Serna JV, Sunny S, Zhou Y, Deng CX, El-Sayed ME. Pulsed ultrasound enhances nanoparticle penetration into breast cancer spheroids. Mol Pharm. 2010 Dec 6;7(6):2006–19.
54. Bae Y, Nishiyama N, Fukushima S, Koyama H, Yasuhiro M, Kataoka K. Preparation and biological characterization of polymeric micelle drug carriers with intracellular pH-triggered drug release property: tumor permeability, controlled subcellular drug distribution, and enhanced in vivo antitumor efficacy. Bioconjug Chem. 2005 Jan-Feb;16(1):122–30.
55. Kim TH, Mount CW, Gombotz WR, Pun SH. The delivery of doxorubicin to 3-D multicellular spheroids and tumors in a murine xenograft model using tumor-penetrating triblock polymeric micelles. Biomaterials. 2010 Oct;31(28):7386–97.
56. Dhanikula RS, Argaw A, Bouchard J-F, Hildgen P. Methotrexate loaded polyether-copolyester dendrimers for the treatment of gliomas: enhanced efficacy and intratumoral transport capability. Mol Pharm. 2008;5(1):105–16.
57. Shen XC, Zhou J, Liu X, Wu J, Qu F, Zhang ZL, Pang DW, Quelever G, Zhang CC, Peng L. Importance of size-to-charge ratio in construction of stable and uniform nanoscale RNA/dendrimer complexes. Org Biomol Chem. 2007 Nov 21;5(22):3674-81.
58. Ackerman ME, Pawlowski D, Wittrup KD. Effect of antigen turnover rate and expression level on antibody penetration into tumor spheroids. Mol Cancer Ther. 2008 Jul;7(7):2233–40.
59. Graff CP, Wittrup KD. Theoretical analysis of antibody targeting of tumor spheroids: importance of dosage for penetration, and affinity for retention. Cancer Res. 2003 Mar 15;63(6):1288–96.
60. Thurber GM, Wittrup KD. Quantitative spatiotemporal analysis of antibody fragment diffusion and endocytic consumption in tumor spheroids. Cancer Res. 2008 May 1;68(9):3334–41.
61. Waite CL, Roth CM. Binding and transport of PAMAM-RGD in a tumor spheroid model: The effect of RGD targeting ligand density. Biotechnol Bioeng. 2011.
62. Ramanujan S, Pluen A, McKee TD, Brown EB, Boucher Y, Jain RK. Diffusion and convection in collagen gels: implications for transport in the tumor interstitium. Biophys J. 2002;83(3):1650–60.
63. Mamasanapalle V, Li X, Polin L, Jasti BR. Novel in vitro model barriers for evaluation of the permeability of antitumor compounds, thiosanthenes. Invest New Drugs. 2006 Mar;24(2):111–6.
64. Lammers T, Kiessling F, Hennink WE, Storm G. Nanotheranostics and image-guided drug delivery: current concepts and future directions. Mol Pharm2010 Dec 6;7(6):1899–912.
65. Kelkar SS, Reineke TM. Theranostics: combining imaging and therapy. Bioconjugate chemistry. 2011 Oct 19;22(10):1879-903.
66. Ponce AM, Viglianti BL, Yu D, Yarmolenko PS, Michelich CR, Woo J, Bally MB, Dewhirst MW. Magnetic

Resonance Imaging of Temperature-Sensitive Liposome Release: Drug Dose Painting and Antitumor Effects. Journal of the National Cancer Institute. 2007 3 January 2007;99(1):53-63.
67. Viglianti BL, Abraham SA, Michelich CR, Yarmolenko PS, MacFall JR, Bally MB, Dewhirst MW. In vivo monitoring of tissue pharmacokinetics of liposome/drug using MRI: Illustration of targeted delivery. Magnetic Resonance in Medicine. 2004;51(6):1153-62.
68. Viglianti BL, Ponce AM, Michelich CR, Yu D, Abraham SA, Sanders L, Yarmolenko PS, Schroeder T, MacFall JR, Barboriak DP, Colvin OM, Bally MB, Dewhirst MW. Chemodosimetry of in vivo tumor liposomal drug concentration using MRI. Magnetic Resonance in Medicine. 2006;56(5):1011-8.
69. Onuki Y, Jacobs I, Artemov D, Kato Y. Noninvasive visualization of in vivo release and intratumoral distribution of surrogate MR contrast agent using the dual MR contrast technique. Biomaterials. 2010;31(27):7132-8.
70. Iqbal U, Albaghdadi H, Nieh MP, Tuor UI, Mester Z, Stanimirovic D, Katsaras J, Abulrob A. Small unilamellar vesicles: a platform technology for molecular imaging of brain tumors. Nanotechnology. 2011 May 13;22(19):195102.
71. Hoang B, Lee H, Reilly RM, Allen C. noninvasive monitoring of the fate of 111in-labeled block copolymer micelles by high resolution and high sensitivity microSPECT/CT imaging. Mol Pharm. 2009;6(2):581-92.
72. Thiagarajah JR, Kim JK, Magzoub M, Verkman AS. Slowed diffusion in tumors revealed by microfiberoptic epifluorescence photobleaching. Nat Methods. 2006 Apr;3(4):275–80.
73. Nakahara T, Norberg SM, Shalinsky DR, Hu-Lowe DD, McDonald DM. Effect of inhibition of vascular endothelial growth factor signaling on distribution of extravasated antibodies in tumors. Cancer Res. 2006 Feb 1;66(3):1434–45.
74. Tan YF, Chandrasekharan P, Maity D, Yong CX, Chuang KH, Zhao Y, Wang S, Ding J, Feng SS. Multimodal tumor imaging by iron oxides and quantum dots formulated in poly (lactic acid)-d-alpha-tocopheryl polyethylene glycol 1000 succinate nanoparticles. Biomaterials. 2011 Jan 21.
75. Brown EB, Boucher Y, Nasser S, Jain RK. Measurement of macromolecular diffusion coefficients in human tumors. Microvasc Res. 2004;67(3):231–6.
76. Wu NZ, Klitzman B, Rosner G, Needham D, Dewhirst MW. Measurement of material extravasation in microvascular networks using fluorescence video-microscopy. Microvasc Res. 1993 Sep;46(2):231–53.
77. Brown EB, Campbell RB, Tsuzuki Y, Xu L, Carmeliet P, Fukumura D, Jain RK. In vivo measurement of gene expression, angiogenesis and physiological function in tumors using multiphoton laser scanning microscopy. Nat Med. 2001 Jul;7(7):864-8.
78. Alexandrakis G, Brown EB, Tong RT, McKee TD, Campbell RB, Boucher Y, Jain RK. Two-photon fluorescence correlation microscopy reveals the two-phase nature of transport in tumors. Nat Med. 2004 Feb;10(2):203-7.
79. Stroh M, Zimmer JP, Duda DG, Levchenko TS, Cohen KS, Brown EB, Scadden DT, Torchilin VP, Bawendi MG, Fukumura D, Jain RK. Quantum dots spectrally distinguish multiple species within the tumor milieu in vivo. Nat Med. 2005 Jun;11(6):678-82.
80. Amoozgar... [illegible] P, Masedunskas A, Weigert R. Intravital microscopy as a tool to study drug delivery in preclinical studies. Adv Drug Deliv Rev. 2011 Jan-Feb;63(1-2):119-28.
81. Smith BR, Cheng Z, De A, Koh AL, Sinclair R, Gambhir SS. Real-time intravital imaging of rgd–quantum dot binding to luminal endothelium in mouse tumor neovasculature. Nano Letters. 2008;8(9):2599–606.
82. Tada H, Higuchi H, Wanatabe TM, Ohuchi N. In vivo real-time tracking of single quantum dots conjugated with monoclonal anti-HER2 antibody in tumors of mice. Cancer Res. 2007 Feb 1;67(3):1138–44.
83. Bhirde AA, Patel V, Gavard J, Zhang G, Sousa AA, Masedunskas A, Leapman RD, Weigert R, Gutkind JS, Rusling JF. Targeted Killing of Cancer Cells in Vivo and in Vitro with EGF-Directed Carbon Nanotube-Based Drug Delivery. ACS Nano. 2009;3(2):307-16.
84. Reddy ST, Berk DA, Jain RK, Swartz MA. A sensitive in vivo model for quantifying interstitial convective transport of injected macromolecules and nanoparticles. J Appl Physiol. 2006 Oct 1;101(4):1162–9.
85. Fujimori K, Covell DG, Fletcher JE, Weinstein JN. A modeling analysis of monoclonal antibody percolation through tumors: a binding-site barrier. J Nucl Med. 1990 Jul;31(7):1191–8.
86. Saga T, Neumann RD, Heya T, Sato J, Kinuya S, Le N, Paik CH, Weinstein JN. Targeting cancer micrometastases with monoclonal antibodies: a binding-site barrier. Proc Natl Acad Sci U S A. 1995 Sep 12;92(19):8999-9003.
87. Thurber GM, Zajic SC, Wittrup KD. Theoretic criteria for antibody penetration into solid tumors and micrometastases. J Nucl Med. 2007 Jun;48(6):995–9.
88. Schmidt MM, Wittrup KD. A modeling analysis of the effects of molecular size and binding affinity on tumor targeting. Mol Cancer Ther. 2009 Oct 1;8(10):2861–71.
89. Tzafriri AR, Levin AD, Edelman ER. Diffusion-limited binding explains binary dose response for local arterial and tumour drug delivery. Cell Prolif. 2009 Jun;42(3):348–63.
90. Su D, Ma R, Salloum M, Zhu L. Multi-scale study of nanoparticle transport and deposition in tissues during an injection process. Med Biol Eng Comput. 2010;48(9):853–63.


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这本国际期刊翻译了俄罗斯和东欧国家语言的研究文献，是目前唯一收录藻类两本期刊中的一本。

4

等离子体医学

相对于电离辐射、激光、超声波、核磁共震技术，等离子体技术1998年才应用于医药领域。目前已经广泛应用于微创外科和内窥镜手术领域。本期刊是目前唯一一本等离子体医学期刊。

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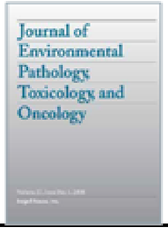
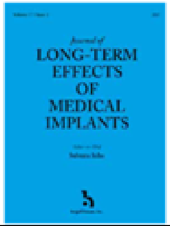
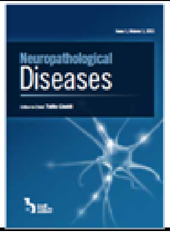
国际生理学和病理学期刊

期刊侧重出版生理学、病理学和实验医学领域的论文，同时还包括业内专家针对当前热点撰写的评论文章、快报、医学假说和会议报告，以及部分来自乌克兰研究人员撰写的优秀论文英文版

临床医学类期刊系列

期刊名称		内容介绍
	《生物医学和工程研究规范条例》 Ethics in Biology, Engineering and Medicine	医学伦理学协会的官方出版物。刊载基础和临床研究工作中涉及的伦理问题和政策的评论，特别是当前社会环境下重大生物医学发现和新的生物医学技术。
	《环境病理学、毒理学和肿瘤学期刊》 Journal of Environmental Pathology, Toxicology and Oncology	期刊收录影响人类和动物致癌的条件和因素方面研究论文和评论，服务于生物学各个领域的科学家，如药理学家，化学家，免疫学家，药理学家，肿瘤学家，肺炎学家和行业技术专家等。
	《器官移植长期效应期刊》 Journal of Long-Term Effects of Medical Implants	期刊旨在更好地了解在合适的动物和人类身上进行临床前期器官移植的失败机制，以及建立临床前和临床研究之间的有效联系。特别欢迎是对移植数据的分析综述，对侵入性和非侵入性操作的数据讨论，以及计算机模拟器官移植的论文。
	《神经病理学疾病》 Neuropathological Diseases	期刊出版了一些相关会议和研讨会的主题报告和专家发言。文章作者是由该领域专家和临床研究人员选定，稿件经过特邀编辑严格评审。期刊每一期都围绕一个主题展开，每3个月有一期特刊。期刊主要目的是促进各种观点和讨论议题的进一步融合。
	《免疫病理学疾病和治疗论文集》 Forum on Immunopathological Diseases and Therapeutics	期刊作为研讨会后的出版物，旨在挖掘对于疾病的发病机理、发展和表现有着决定性因素的基因产物。 该研讨会涉及的主题，包括生物化学，免疫学，分子生物学，遗传学，分子和细胞机制的疾病，临床研究和新的创新疗法。

谢谢您的观看

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