



## Begell Digital Library数据库使用指南





# 提纲

01

BEGELL 出版社介绍

---

02

BEGELL 产品介绍

---

03

BEGELL 特色资源

---



## 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运输”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。



## 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。

# BEGELL DIGITAL LIBRARY 内容介绍



## 工程研究选集

31本电子期刊  
15本电子书  
4个会议录和参考文献资料  
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

---



## BEGELL 特色资源介绍



访问网址: <https://www.begellhouse.com/>

[Customer Login](#)[Shopping Cart](#)[HOME](#)[BOOKS](#)[eBOOKS](#)[JOURNALS](#)[REFERENCES AND PROCEEDINGS](#)[AUTHORS, EDITORS, REVIEWERS](#)[A-Z PRODUCT INDEX](#)

# Begell Multimedia

Begell Multimedia is an online multimedia platform that hosts multimedia databases and multimedia journals. The content is peer-reviewed and presented in an exciting interactive format with videos, animations, unit conversion and simple calculators. Begell Multimedia runs on a semantic search navigation system with built-in taxonomy of thousands of scientific, engineering and biomedical terms. The content is developed by international editorial boards and provides total global coverage and usage in 146 countries worldwide. Begell Multimedia content has been developed over 33 years and is updated quarterly by the foremost known specialists in the world – it is now fully searchable and available for tablets and other portable devices.



BEGELL  
DIGITAL PORTAL

BEGELL  
DIGITAL LIBRARY

ENGINEERING  
RESEARCH COLLECTION

BIOMEDICAL  
RESEARCH COLLECTION

BEGELL  
MULTIMEDIA

BEGELL EBOOK  
PLATFORM

# Begell Digital Library

## Research Collections



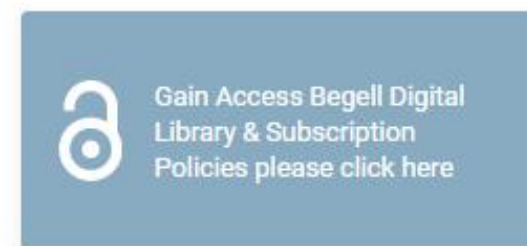
检索框

All Content

Publication Title

Search

## Databases



## References



## Proceedings



# BDL工程研究选集

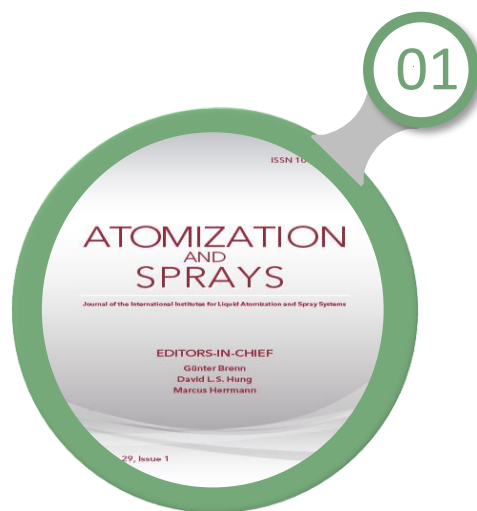
学科范围：

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



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



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;

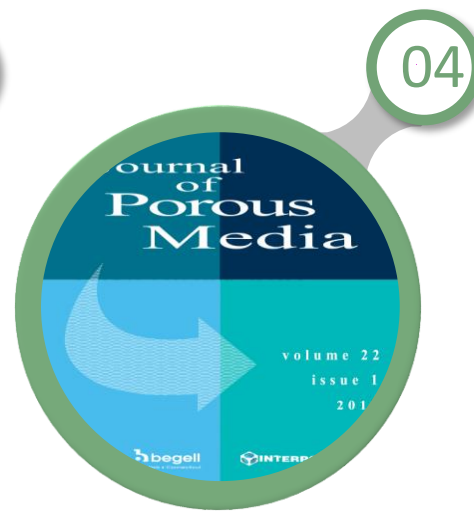
随着纳米科技的发展, 材料学变得愈发重要。合成材料在材料学领域的地位更是关键!



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)



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。



## 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

HEAT  
TRANSFER  
RESEARCH

### EDITORIAL BOARD

**YITUNG CHEN**

University of Reno, Las Vegas, *USA*

**P. S. GHOSHDASTIDAR**

IIT, Kanpur, *India*

**ZHIXIONG (JAMES) GUO**

Rutgers University, *USA*

**YA-LING HE**

Xi'An Jiaotong University, *China*

**LIN-HUA LIU**

Harbin Institute of Technology, *China*

**CHENG-XIAN LIN**

Florida International University, *USA*

**HONGBIN MA**

University of Missouri, *USA*

**KHELLIL SEFIANE**

University of Edinburgh, *UK*

**K VENKATA SUBBIAH**

IIT, Hyderabad, *India*

**BENGT SUNDEN**

Lund Institute of Technology, *Sweden*

**BERNARD THONON**

CEA, Grenoble, *France*

**RU-ZHU WANG**

Shanghai Jiaotong University, *China*

**MING-HOU XU**

Huazhong University of Science and  
Technology, *China*

**XING ZHANG**

Tsinghua University, *China*

**T.S. ZHAO**

Hong Kong University of Science and  
Technology, *Hong Kong*

[▶ Access Full Text](#)[▶ Forthcoming Articles](#)[▶ Editorial Board](#)[▶ Author Instructions](#)[▶ Submit an Article](#)[▶ Get Permissions](#)[▶ Recommend to my Librarian](#)[▶ Download MARC record](#)[▶ Bookmark this Page](#)[Free Article for this Journal](#)

# 15本特色电子书资源

## eBooks



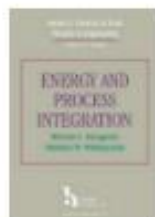
Contemporary Perspectives  
on Air Cooling of Electronic  
Components



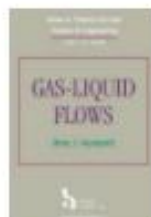
Contemporary Perspectives  
on Flow Boiling Instabilities  
in Microchannels and  
Minichannels



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



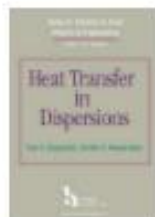
Energy and Process  
Integration



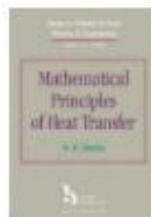
Gas-Liquid Flows



Heat Transfer and Fluid Flow  
in Microchannels



Heat Transfer in Dispersions



Mathematical Principles of  
Heat Transfer



Practical Heat Transfer



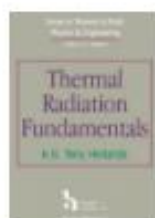
Practical Thermal Design of  
Air-Cooled Heat Exchangers



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)

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

三大主要功能：视觉导览树状图、A-Z主题词索引、动态影像

## THA 重点

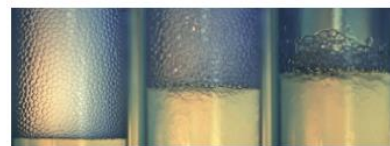
了解基于热力学、传热和流体力学基础知识的应用热流体的新颖研究、创新和突破。



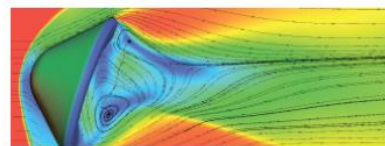
THA 重点  
“通过 Thermopedia 学习和启发”

THA 重点 →

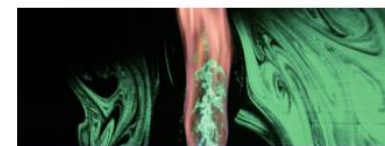
## 基础科学与工程



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

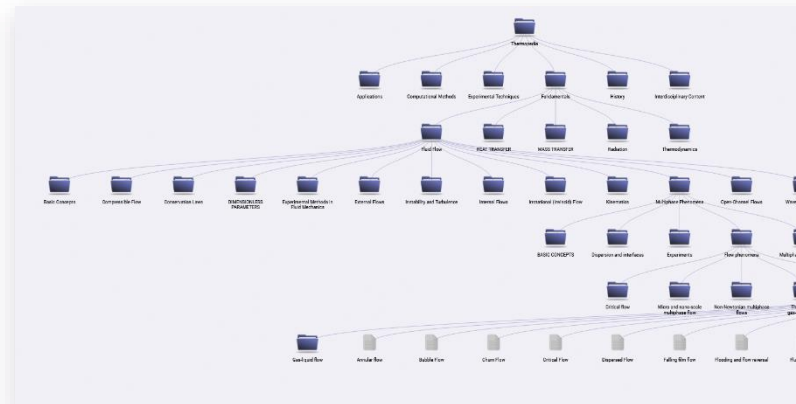
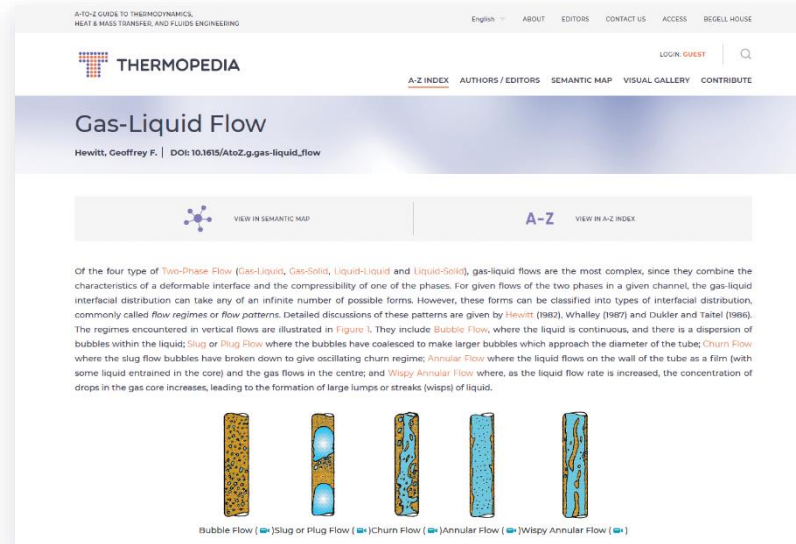


储能电池



# THERMOPEDIA™

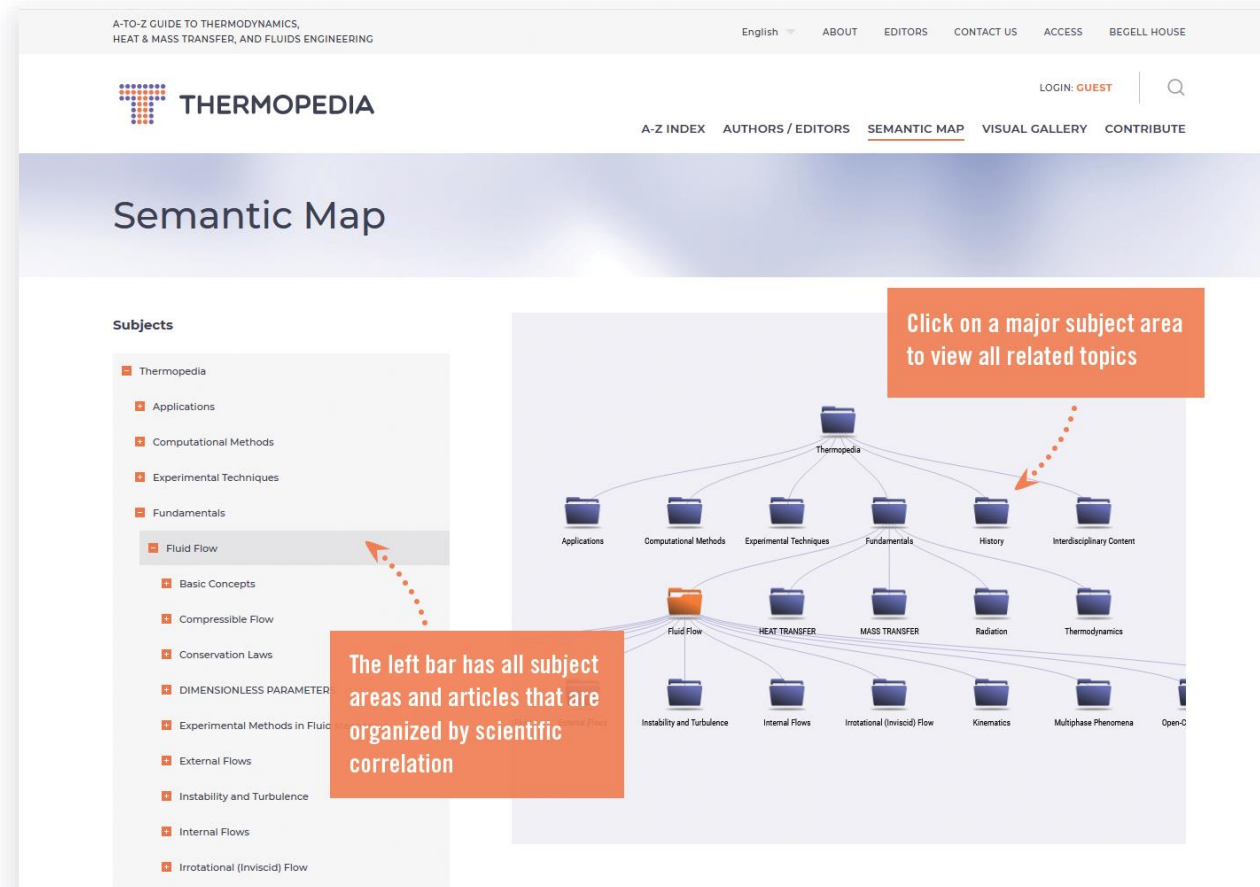
- HTML全文文章, 动画, 实验数据视频
- 语义地图导航
- 相关内容链接: Links to related content provided within each article
- 高效的检索功能
- 支持中文界面浏览
- 通过CrossRef可以交叉链接到引文信息



# Browse THERMOPEDIA™

通过Semantic Map or the A-Z index检索主题

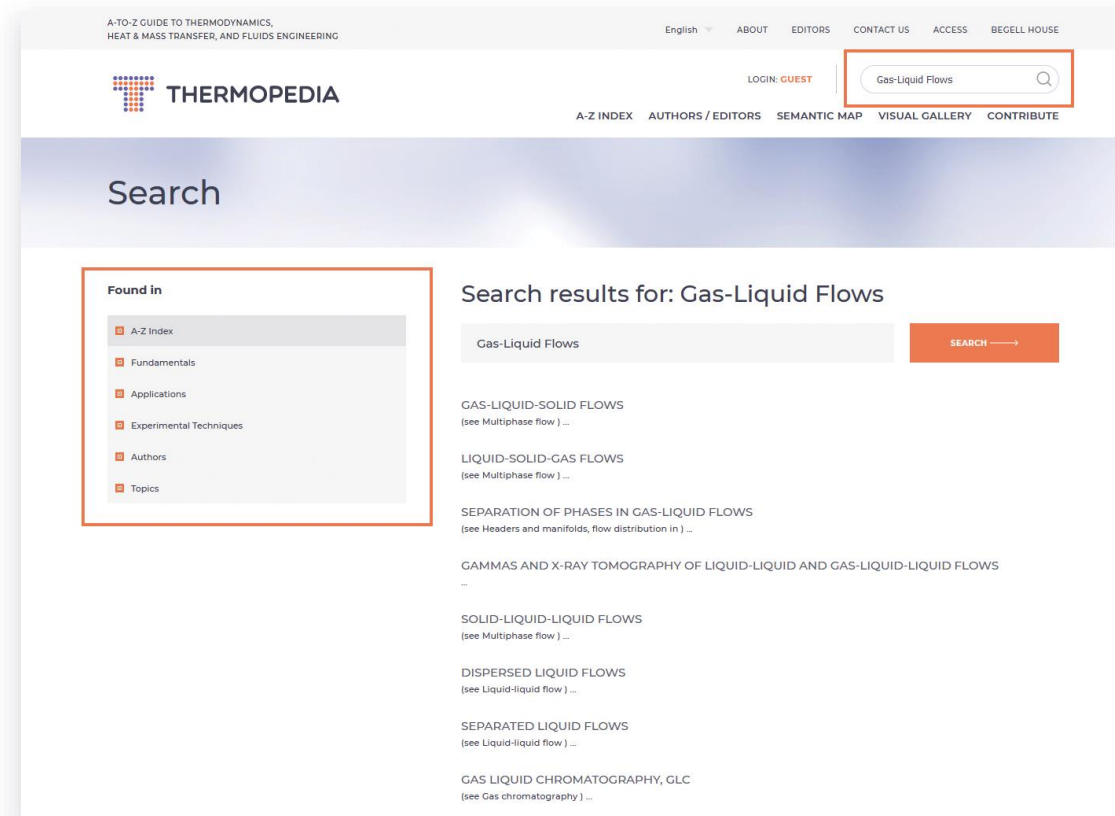
很容易看到所有主题的关联性





# THERMOPEDIA™ Search Tools: Quick Search

利用界面右上角的检索框进行快速检索

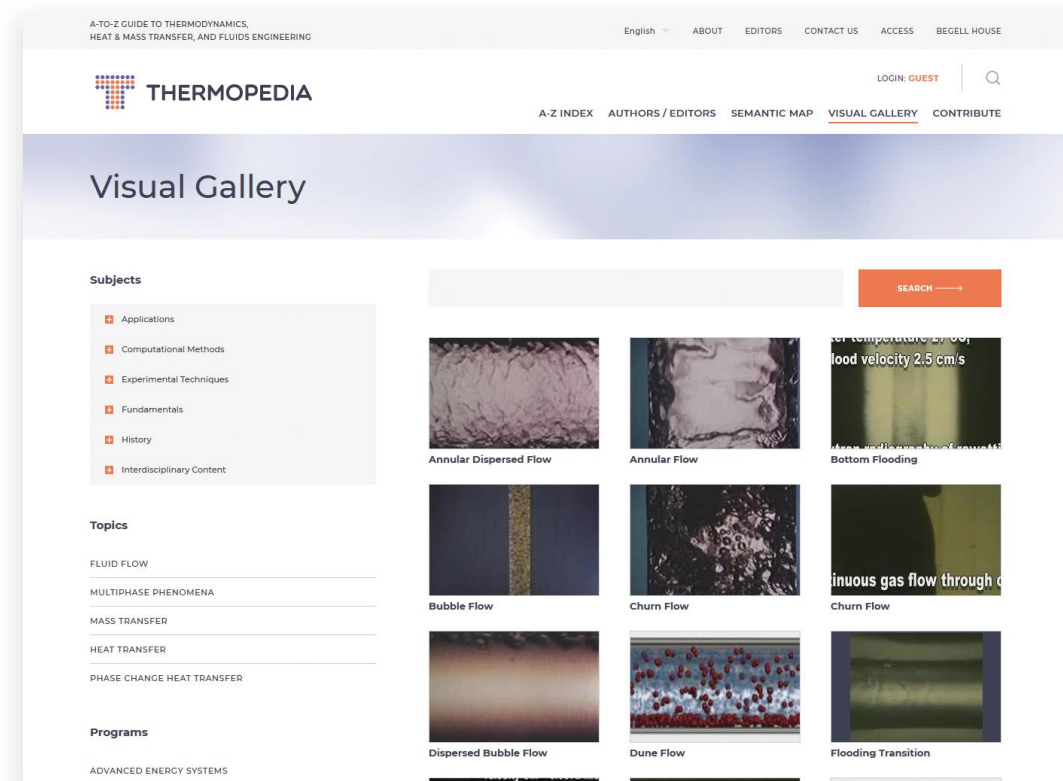


利用不同的特征来对检索结果进行筛选, 例如“Fundamentals”, “Applications” or others

# THERMOPEDIA™

## Visual Gallery

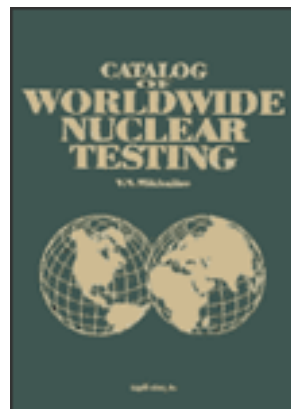
在可视化图库中分析不同类型的流体流动和传热传质



VOLUME UP: 大多数视频都有声音，并有对过程 and 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:](#)

Search Specialist

Search: **1 results found**

**All** | [A](#) | [B](#) | [C](#) | [D](#) | [E](#) | [F](#) | [G](#) | [H](#) | [I](#) | [J](#) | [K](#) | [L](#) | [M](#) | [N](#) | [O](#) | [P](#) | [Q](#) | [R](#) | [S](#) | [T](#) | [U](#) | [V](#) | [W](#) | [X](#) | [Y](#) | [Z](#)

Last Name	First Name	Specialisation Area	Country
<a href="#">He</a>	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](mailto:yalinghe@mail.xjtu.edu.cn); [yalinahe@xjtu.edu.cn](mailto:yalinahe@xjtu.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

**Url:** <http://en.xjtu.edu.cn/>

Membership	Awards	Education	Experience	BH Publications	Other Publications	Roles	Co-Authors
------------	--------	-----------	------------	-----------------	--------------------	-------	------------

## 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 Sundén, 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

## Directory

### 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

### Phase Change Heat Transfer

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

### Combustion and Fuels

- ☐ Fuel sprays
- ☐ 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
- ☐ Recycling 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 comfort
- ☐ 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
<a href="#">Abadie</a>	Marc O.	Green buildings, Thermal pollution	BRAZIL
<a href="#">Abrantes</a>	Juliana Kuhlmann	Heat exchangers	BRAZIL
<a href="#">Alahiane</a>	Nasser	Flow patterns, Multiphase flow modelling, Multiphase flows, Particle technology	BRAZIL
<a href="#">Albuquerque</a>	Margeli	CO2 sequestration, Experimental techniques, Global warming, Turbulence models	BRAZIL



HEAT EXCHANGER  
DESIGN HANDBOOK

EXECUTIVE EDITOR: Satish Kandlikar

[Home](#) [TOC](#) [Index](#)

Search

[Editorial Board](#)

[TOC](#)

[Database Access](#)


[HEDH 2008 Print](#)


[Submit Articles](#) [Subscriptions Policy](#) [Logout](#) [Back to Digital Library](#)


[Add to Bookmarks](#) [Print](#)

The Heat Exchanger Design Handbook (HEDH) was first launched in 1983. Since then, it has been continuously updated and now, after two decades and in more than double its original size, remains the **standard reference** source for design and other information on heat transfer, heat exchangers, and associated technologies. Currently, **HEDH** contains more than 6,000 pages of technical information **compiled and edited by the world's foremost specialists** and is presented in **five parts** dealing respectively with:

- Heat Exchanger Theory
- Fluid Mechanics and Heat Transfer
- Thermal and Hydraulic Design of Heat Exchangers
- Mechanical Design of Heat Exchangers
- Physical Properties

  
TECHNICAL DESCRIPTION

  
DATABASE ACCESS



Tel.: (203) 938 1300  
Fax: (203) 938 1304

50 Cross Highway  
Redding, CT 06896

orders@begellhouse.com

- ▶ 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. Volume 1
  - 1.1. Heat exchanger theory: Description of heat exchanger types
    - 1.1.1. Types of flow configuration
    - 1.1.2. Types of interactions between streams
    - 1.1.3. Types of temperature change pattern
    - 1.1.4. Types of interface between streams
    - 1.1.5. Types of heat exchange equipment
    - 1.1.6. Unsteady operation
  - 1.2. Definitions and quantitative relationships For heat exchangers
    - **1.2.1. Thermodynamics: Brief notes on important concepts**
    - 1.2.2. Flux relationships
    - 1.2.3. Transfer coefficient dependencies
    - 1.2.4. Balance equations applied to complete equipment
    - 1.2.5. The differential equations governing streams

## 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 ( $^{\circ}\text{C}$ ).

#### 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 ( $\text{N/m}^2$ ). Density is the mass of the material per unit volume; its units are kilograms per cubic meter ( $\text{kg/m}^3$ ).

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

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

where  $\dot{M}$  stands for the mass rate of flow ( $\text{kg/s}$ ),  $\Delta$  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

## IHTC 3

1966, Chicago, USA

## IHTC 8

1986, San Francisco, USA

## IHTC 13

2006, Sydney, Australia

## IHTC 4

1970, Paris-Versailles, France

## IHTC 9

1990, Jerusalem, Israel

## IHTC 15

2014, Kyoto, Japan

## IHTC 5

1974, Tokyo, Japan

## IHTC 10

1994, Brighton, UK

## IHTC 16

2018, Beijing, China

## IHTC 6

1978, Toronto, Canada

## IHTC 11

1998, Kyongju, Korea

## IHTC 17

2023, Cape Town, South Africa

## IHTC 7

1982, Munich, Germany

## IHTC 12

2002, Grenoble, France

**BegeII收录所有历届传  
热大会的会议论文!!!**



# 清华大学承办第16届国际传热大会

航院教授张兴当选国际传热大会常务理事兼主席

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。



Home > Archives > IHTC-13



ISSN: 2377-424X (online)  
ISSN: 2377-4371 (flashdrive)

[Buy Now](#)

- 2018
- 2014
- 2006
- 2002
- 1998

### International Heat Transfer Conference 13

2006, 13-18 August, Sydney, Australia

The papers presented at the Thirteenth International Heat Transfer Conference, which was held in Sydney, Australia under the joint auspices of the Australasian Fluids and Thermal Engineering Society and Engineers Australia on behalf of the Assembly for International Heat Transfer Conferences. IHTC-13 was the first in this long-running series to be held in the Southern Hemisphere.

IHTC-13 offered 33 Keynote Lectures, including lectures by the winners of the Max Jakob and Donald Q. Kern Awards of ASME and AIChE; 657 contributed papers (all of which were peer reviewed by members of the International Scientific Committee and their colleagues, to whom we are greatly indebted); seven panel discussions; an Open Forum for the presentation of last minute work; and an exhibition of books and journals. There was an extensive programme of social events and technical visits.

To Access Full Text Conference Proceedings please click [here](#)

#### Most Downloaded Articles

PHASE-CHANGE HEAT TRANSFER IN MICROSYSTEMS  
Hui Ying Wu, Ping Cheng

- Table of Contents
- Publication Ethics and Malpractice
- Recommend to my Librarian
- Bookmark this Page

- Preface
- International Scientific Committee
- Conference Officers
- Nomenclature

- ▶ 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。



ICHMT  
DIGITAL LIBRARY

- 2019
- 2018
- 2017
- 2016
- 2015
- 2014
- 2013
- 2012
- 2011
- 2010

## Welcome to the ICHMT Digital Library!

The Proceedings of the International Centre for Heat and Mass Transfer represent the publications of the Centre derived from International Seminars, International Schools, Symposia, Short Courses and Forums. These meetings represent an extensive achievement, on an international scale, of the Centre and its mission. Covering all branches of heat and mass transfer, the Proceedings show the pursuit of excellence and the fostering of international cooperation. The coverage of the Proceedings extends from the basic fundamentals to the forefront research in the field of thermofluid engineering, in both industrial and academic, as well as computational fields.

Begell House Publishers, Inc. developed and maintains the ICHMT Digital Library. Begell House, since 1994, has been the official publishing arm of ICHMT, and continues to this day.

### Most Downloaded Articles

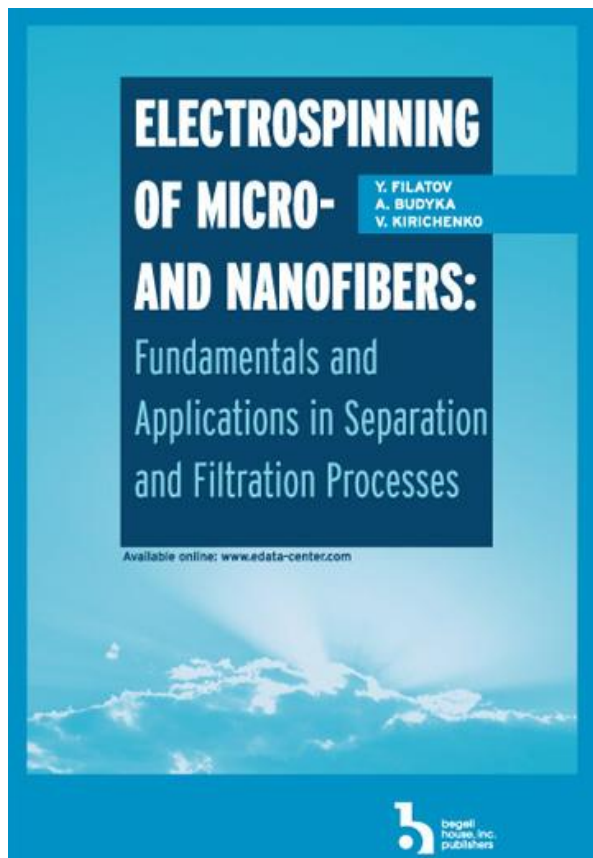
FLOW AND HEAT TRANSFER IN ROTATING-DISC SYSTEMS  
J. M. Owen

RECONSTRUCTION OF THREE-DIMENSIONAL TEMPERATURE AND CONCENTRATION FIELDS OF A LAMINAR FLAME BY MACHINE LEARNING  
Tao Ren, Michael F. Modest

CHARACTERIZATION OF NANOSTRUCTURED THERMAL INTERFACE MATERIALS - A REVIEW

- 中文名称：  
《国际传热传质中心数字图书馆》
- 出版物介绍：

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。



中文名称：微纳米纤维静电纺丝：分离和过滤过程基础理论

出版物介绍：本书出版于2007年，包含488页。

**唯一出版**静电纺丝制备纳米纤维的研究应用的出版物，覆盖防御、核科学、净化空气、生物技术和许多其他科学领域。譬如，应用在原子核电项目中的过滤器就是使用静电纺丝技术。俄罗斯在该技术领域具有领先优势。本资源是该领域研究人员必不可少，也是无法替代的参考资源

本书包含如下主题：

纤维材料的电纺丝机理及结构

纺丝液性能对纤维形成过程及性能的影响

纤维材料(Petryanov过滤器)及其类似物的静电纺丝技术

用纤维过滤器捕获气溶胶粒子的控制关系

等等。。。。。。。



# BDL生物医学研究选集















1. 收录了18种生物医学期刊，包括享有盛名的权威评论期刊 Critical Reviews™ 系列，其所选主题大多数是当前最热门的研究和实践问题，由多位专家汇集现有知识和历史资料从多个角度深入编写评论。
2. 有重点地阐述了各个生物医学领域的最新研究成果，促进各种观点和讨论议题的进一步融合。
3. 学科包括肿瘤学、免疫学、基因表达学、药理学和器官移植学等众多生物医学领域的最新研究成果。
4. 许多期刊为生物医学中的特色期刊，内容展示了新学科的新研究成果。

## The Biomedical Research Collection

<a href="#">Gain Access</a>	<a href="#">About</a>	<a href="#">Bookmark this Page</a>	<a href="#">Download MARC record</a>	<a href="#">Recommend to my Librarian</a>
-----------------------------	-----------------------	------------------------------------	--------------------------------------	---

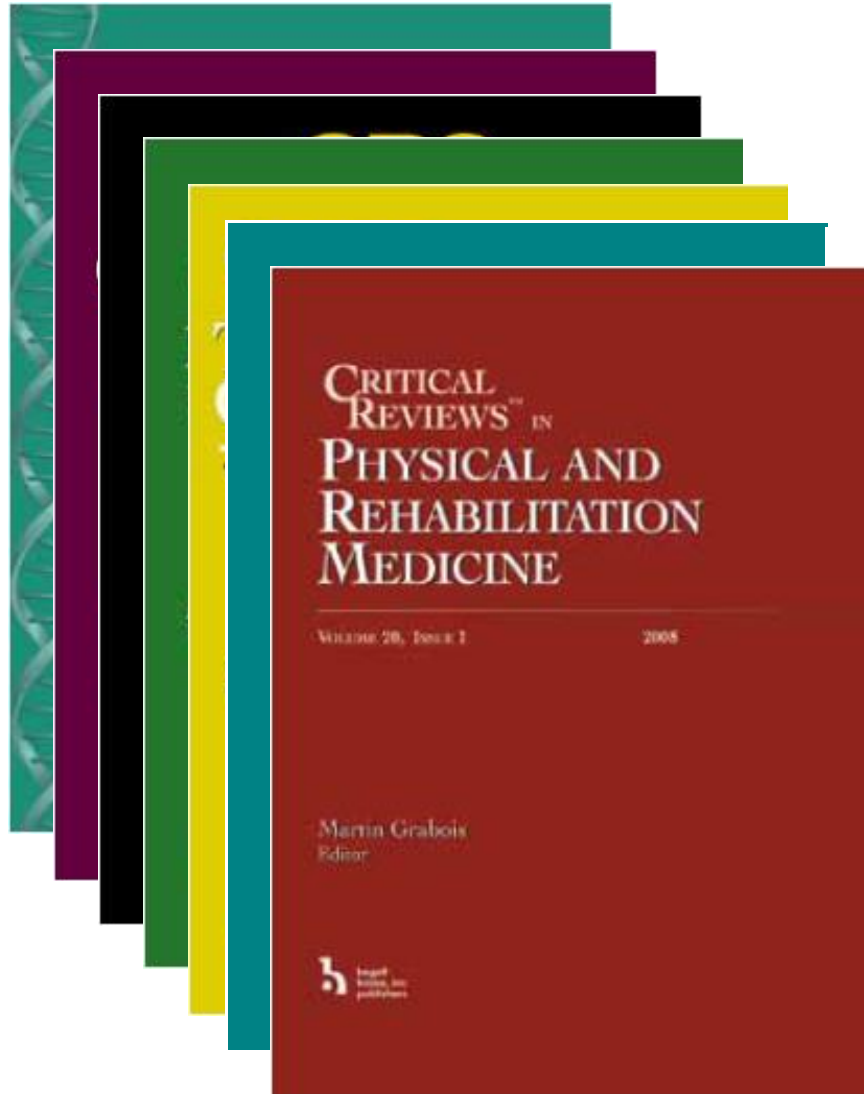
### Journals

18本生物医学期刊：基础医学、病理学、临床医学、药学等多个学科

	Critical Reviews™ in Biomedical Engineering		Critical Reviews™ in Eukaryotic Gene Expression		Critical Reviews™ in Immunology
	Critical Reviews™ in Neurobiology		Critical Reviews™ in Oncogenesis		Critical Reviews™ in Physical and Rehabilitation Medicine
	Critical Reviews™ in Therapeutic Drug Carrier Systems		Ethics in Biology, Engineering and Medicine: An International Journal		Hydrobiological Journal
	International Journal of Medicinal Mushrooms		International Journal of Physiology and Pathophysiology		International Journal on Algae
	Journal of Environmental Pathology, Toxicology and Oncology		Journal of Long-Term Effects of Medical Implants		Neuropathological Diseases
	Onco-Therapeutics		Plasma Medicine		Visualization, Image Processing and Computation in Biomedicine

	出版物	中文名称
《评论综述》系列7种	Critical Reviews™ in Biomedical Engineering	生物医学工程评论综述™
	Critical Reviews™ in Eukaryotic Gene Expression	真核基因表达评论综述™
	Critical Reviews™ in Immunology	免疫学评论综述™
	Critical Reviews™ in Neurobiology	神经生物学评论综述™
	Critical Reviews™ in Oncogenesis	肿瘤形成评论综述™
	Critical Reviews™ in Physical and Rehabilitation Medicine	身体康复医学评论综述
	Critical Reviews™ in Therapeutic Drug Carrier Systems	医药载体系统评论综述
特色期刊5种：研究领域独特	Plasma Medicine	等离子医学
	Hydrobiological Journal	水生生物学期刊
	International Journal of Medicinal Mushrooms	国际药用蘑菇期刊
	International Journal of Physiology and Pathophysiology	国际生理学与病理学期刊
	International Journal on Algae	国际藻类期刊
实践性期刊6种：临床的诊断和治疗	Journal of Environmental Pathology, Toxicology and Oncology	环境病理学，毒理学和肿瘤学期刊
	Journal of Long-Term Effects of Medical Implants	器官移植长期效应期刊
	Neuropathological Diseases	神经病理疾病
	Visualization, Image Processing and Computation in Biomedicine	生物医学的图像处理，计算和显示
	Ethics in Biology, Engineering and Medicine	生物，工程和医学的道德
	Onco Therapeutics	Onco治疗学(原名:免疫病理疾病与治疗学论文)

# 评论综述 Critical Reviews™系列



- ▶ 中文名称：  
《身体康复医学评论综述™》
- ▶ 出版物介绍：  
期刊涉及除了改变身体的化学性能（药物）或完整性（手术）之外的所有康复治疗技术。包括完善的诊断方法、治疗方法和技术、身体康复医学方面的评论文章。由期刊编辑挑选主题，并邀请该领域内的权威专家和研究人员发表评论。



Home > Journals > Critical Reviews™ in Biomedical Engineering



## Critical Reviews™ in Biomedical Engineering

Editor-in-Chief: **Anthony J. McGoron**

Senior Editor: **Markad Kamath**

Associate Editors: **Garry Duffy**, **Alain J. Kassab**,

**Victoria Timchenko**

SJR: 0.262

SNIP: 0.372

CiteScore™: 2.2

H-Index: 56

### Indexed in

Clarivate  
BOISIS

Engineering Village  
Engineering Village

EBSCO  
EBSCO

PubMed  
PubMed

Google  
Google Scholar (USA)

ISI  
ISI (China)

Copyright Clearance Center (USA)

Scilit  
Scit (Switzerland)

Scopus (Prev)

Embase (USA)

Inspec

British Library

Ulrich's  
Ulrich's

Portico (Digital)

Thomson (Thomson)

Published 6 issues per year

ISSN Print: 0278-940X

ISSN Online: 1943-619X

Gain Access >

Articles ▾

Editors ▾

For Authors ▾

Submit an Article

Subscribe ▾

## Volumes and Issues

Volume 52, 2024

Volume 51, 2023

Volume 50, 2022

Volume 49, 2021

Volume 48, 2020

Volume 47, 2019

Volume 46, 2018

Editor-in-Chief



**ANTHONY J. MCGORON**  
Department of Biomedical Engineering, Florida International University, Miami, FL 33174

Senior Editor



**MARKAD KAMATH**  
Department of Medicine, McMaster University, 1200 Main St. West, Hamilton, Ontario L8N 3Z5, Canada

Associate Editors



**GARRY DUFFY**  
Regenerative Medicine Institute, National University of Ireland Galway, University Road, Galway, Connacht, H91 TK33, Ireland



**ALAIN J. KASSAB**  
Department of Mechanical and Aerospace Engineering, University of Central Florida, 4000 Central Florida Blvd, Orlando, Florida, USA



**VICTORIA TIMCHENKO**  
School of Mechanical and Manufacturing Engineering, The University of New South Wales, Sydney, NSW, 2052, Australia

### Editorial Board



**RAJENDRA ACHARYA**  
Professor (Artificial Intelligence in Health), Section School of Mathematics, Physics and Computing, University of South...more  
Email: Rajendra.Acharya@unisa.edu.au



**PRISCILLA BAKER**  
Department of Chemistry, University of the Western Cape, Bellville, 7535, Republic of South Africa  
Email: pbaker@uwc.ac.za



**D. KACY CULLEN**  
University of Pennsylvania, Philadelphia, PA 19104, USA  
Email: dkacy@mail.med.upenn.edu



**DIETER HAEMMERICH**  
Medical University of South Carolina, Charleston, SC 29425, USA  
Email: haemmerich@ieee.org



**RICHARD MAGIN**  
University of Illinois-Chicago, Chicago, IL 60607-7082, USA  
Email: rmagin@uic.edu



**MICHAEL D. NOSEWORTHY**  
Medical Physics and Applied Radiation Sciences, McMaster University, Hamilton, ON, Canada, Imaging Research Centre, St...more  
Email: nosewor@mcmaster.ca



**PUNIT PRAKASH**  
Department of Electrical and Computer Engineering, Kansas State University, Manhattan, KS 66506, USA  
Email: prakashp@ksu.edu, prakashp@kstate.edu



**ANDRAS SZELECS**  
NADIC Agro-Environmental Research Institute, H-1587 Budapest, POB 393, Hungary  
Email: a.szelecs@cefi.hu



**R.S. SINGH**  
Department of Biotechnology, Punjab University, Patiala 147 002, India  
Email: rssb@pbi.ac.in



**XUEMING WANG**  
School of Biological Science and Medical Engineering, Southeast University, Nanjing, China  
Email: xueming@seu.edu.cn



**YUMIN YANG**  
Co-innovation Center for Neuroregeneration, Nantong University Nantong, Jiangsu 226001, China  
Email: yangym@ntu.edu.cn



**IBRAHIM ABLOHALIM**  
Department of Electro-Optic Engineering, Ise Katz Institute for Nanoscale Science and Technology, Ben Gurion University...more  
Email: abdulh@bgu.ac.il



**IOANNIS ANDROULAKIS**  
Rutgers University, Piscataway, NJ 08854, USA  
Email: iannis@rci.rutgers.edu



**JEONG-WOO CHOI**  
Nanobioelectronics Lab, Sogang University Seoul, South Korea  
Email: jwchoi@sogang.ac.kr



**ZHIFEI DAI**  
Department of Biomedical Engineering, College of Future Technology, National Biomedical Imaging Center, Peking University, China  
Email: zhifei.dai@pku.edu.cn



**JOHN G. HARDY**  
Department of Chemistry & Materials Science, Lancaster University, John Creed Avenue, Lancaster, Lancashire, LA1 4YB, UK  
Email: j.g.hardy@lancaster.ac.uk



**SACHIN S. MAMIDWAR**  
Orthogen Corporation, BioLink International Co., 505 Morris Ave., Suite 104, Springfield, NJ, 07081, USA  
Email: smamidwar@orthogenincorp.com



**WAGNER COELHO DE ALBUQUERQUE PEREIRA**  
Biomedical Engineering Program - COPPE, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil  
Email: wagner@peb.ufrr.br



**SUBRATA SAHA**  
Affiliate Professor, Department of Restorative Dentistry, Affiliate Professor, Department of Oral and Maxillofacial Surg...more  
Email: sahas2@uw.edu



**MANIK SHARMA**  
Computer Science and Applications, DAV University, Jalandhar, India  
Email: manik\_sharma25@yahoo.com



**BRADFORD J. SMITH**  
Departments of Bioengineering and Pediatrics (Pulmonology), University of Colorado Denver, Anschutz Medical Campus, 1270...more  
Email: Bradford.Smith@ucdenver.edu



**CHING-CHOU WU**  
Department of Bio-Industrial Mechatronics Engineering, National Chung Hsing University, Xingda Road, South District, Tai...more  
Email: ccwu@dragon.nchu.edu.tw

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

Carolyn L. Waste\* and Charles M. Roth<sup>†,‡</sup>

\*Department of Chemical and Biochemical Engineering, Rutgers University, New Brunswick, New Jersey; †Department of Biomedical Engineering, Rutgers University, New Brunswick, New Jersey

‡ Address all correspondence to: Charles M. Roth, 599 Taylor Road, Piscataway, NJ 08854; Tel: +1732-440-4300; Fax: +1732-445-3773; cmr@cmr.rutgers.edu

**ABSTRACT:** Poor penetration of anticancer drugs into solid tumors significantly limits their efficacy. This phenomenon has long been observed for small-molecule chemotherapeutics, and it can be even more pronounced for nanoscale therapies. Nanoparticles have enormous potential for the treatment of cancer due to their wide applicability as drug delivery and imaging vehicles and their size-dependent accumulation into solid tumors by the enhanced permeability and retention (EPR) effect. Further, synthetic nanoparticles can be engineered to overcome barriers to drug delivery. Despite their promise for the treatment of cancer, relatively little work has been done to study and improve their ability to diffuse into solid tumors following passive accumulation in the tumor vasculature. In this review, we present the complex issues governing efficient penetration of nanoscale therapies into solid tumors. The current methods available to researchers to study nanoparticle penetration into solid tumors are described, and the most recent works studying the penetration of nanoscale materials into solid tumors are summarized. We conclude with an overview of the important nanoscale design parameters governing their tumor penetration, as well as by highlighting critical directions in this field.

**KEY WORDS:** Tumor penetration, solid tumor, nanoparticles, cancer, liposomes, polymeric micelles, drug delivery

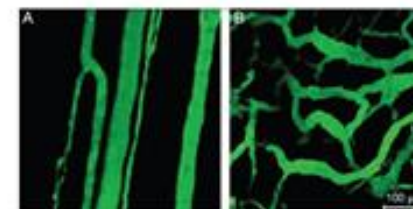
### I. INTRODUCTION

Limited penetration and poor spatial distribution of drugs throughout solid tumors represent significant barriers to their anticancer efficacy. Several conventional small-molecule chemotherapeutics, including doxorubicin,<sup>[1]</sup> paclitaxel,<sup>[2]</sup> and other clinically relevant compounds,<sup>3</sup> are known to exhibit poor distribution throughout solid tumors. These drugs remain localized to regions immediately surrounding blood vessels, leaving large regions of the tumor untouched by the therapy. Their poor tumor distribution may significantly impair their efficacy, contributing to disease recurrence and the administration of high drug doses that cause adverse effects in cancer patients. Improving the distribution of drugs in solid tumors is thought to improve their therapeutic index for the treatment of human disease.<sup>4</sup>

With the increasing application of nanoscale materials for cancer drug delivery and imaging purposes, the importance of tumor penetration by drugs becomes more pronounced. As nanoscale materials are orders of magnitude larger than conventional chemotherapeutic compounds, their transport and diffusion through tumor tissue is even more limited. On the other hand, nanomedicine can be engineered with functionalities to mediate more effective transport within tumors. Whereas significant progress has been made to understand and improve the tumor transport of small-molecule and antibody therapeutics,<sup>5,6</sup> much less work has been done to understand similar phenomena for nanoscale materials.<sup>7,8</sup>

This review focuses on the current state of nanoscale drug delivery systems for enhanced drug distribution throughout solid tumors. The properties of solid tumors that hinder homogeneous drug delivery

## 纳米药物传送系统增强药物到实体瘤：进展和机遇



**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: Greiner MR et al.<sup>9</sup> with permission from Oxford University Press.

are discussed first. Then the available experimental and theoretical methods to study drug distribution in solid tumors are reviewed, with an emphasis on applications to nanoscale drug delivery systems. Finally, the current literature describing methods employed by researchers to understand and overcome the poor tumor transport of nanoscale materials including liposomes, inorganic nanoparticles, and synthetic polymeric systems is reviewed, highlighting the design parameters that are important for each unique type of delivery system. In this review, we define tumor penetration as the transport process that occurs after a nanoparticle drug has left the tumor vasculature (by extravasation) and has entered the adjacent tumor tissue. We discuss methods to study and improve nanoparticle transport through the tumor tissue (both extracellular matrix and tumor cells) after the drug has reached the surface of the tumor.

### II. TUMOR PROPERTIES HINDERING NANOSCALE DRUG TRANSPORT

Compared with healthy tissues, solid tumors have unique structural properties that restrict transport and distribution of drug compounds throughout malignant tissue. Several reviews have thoroughly discussed the architectural features of solid tumors

that hinder drug transport;<sup>9-12</sup> thus, only a brief overview of these features is discussed here.

#### A. Abnormal Vasculature

One critical feature of tumors that enables them to have an abnormal survival advantage is their ability to sustain angiogenesis, or to acquire their own blood supply.<sup>13</sup> For cells to survive, they should be within 100 μm of a blood vessel, allowing transport of oxygen and critical nutrients by molecular diffusion. In the development of healthy tissues, the formation of blood vessels is carefully regulated to ensure that there is an ample blood supply for all cells. Malignant tumors, however, are formed abnormally in the midst of healthy tissues, and therefore they must acquire their own blood supply via angiogenesis to progress to a large size.<sup>14</sup> As the acquisition of a blood supply is abnormal in tumor tissue, the structure of the tumor vasculature is poorly organized compared with healthy tissues (Figure 1). The blood vessels in solid tumors are more heterogeneous in distribution, size, and are more permeable than in healthy tissue.<sup>15</sup> A consequence of heterogeneous vascularization is that some regions of the tissue are less accessible than others to oxygen, nutrients, and therapeutic compounds. One of the theories behind the use of

## 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

The authors acknowledge financial support from the National Institutes of Health (Grant No. R01

EB008278-07) and an National Science Foundation Integrative Graduate Education and Research Traineeship (NSF IGERT) fellowship (Grant No. DGE-0504497) to CW.

## REFERENCES

- Potluri AJ, Rendon A, Hedley D, Lidge 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.
- Lankford J, Dekker H, Fendler L, Luytens J, Luytens S, Hoshino K, Van Pelt, van Dier P, Pardo RM. Doxorubicin Gradient in Human Breast Cancer. *Clinical Cancer Research*. 1999 July 1, 1999;5(7):1783-7.
- Kyle AH, Hoshino LA, Thomas DM, MacIntosh AJ. Limited tissue penetration of tumors: a mechanism for resistance in solid tumors. *Clin Cancer Res*. 2007 May 1;13(9):2894-10.
- Kuh H-J, Jang SH, Whang MG, Warner JR, An J-L-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, Tangirala RK, Cowan DSM, Epstein MG. Limited penetration of anticancer drugs through tumor tissue. *Clin Cancer Res*. 2002 Mar 1;8(3):878-84.
- MacIntosh AJ, Tannock IF. Drug penetration in solid tumors. *Nat Rev Cancer*. 2006 Aug 6;6(8):583-92.
- Jang SH, Whang MG, Lu D, An J-L-S. Drug delivery and transport to solid tumors. *Pharm Res*. 2003;20(9):1317-30.
- Holback H, Yee Y. Intratumoral drug delivery with nanoparticles: carrier. *Pharm Res*. 2011 Jan 7.
- Jain RK, Stylianopoulos T. Delivering nanomedicine to solid tumors. *Nat Rev Clin Oncol*. 2010 Nov;7(11):823-44.
- Housman D, Weinberg RA. The hallmarks of cancer. *Cell*. 2000 Jan 7;100(1):57-70.
- Gewirtz K. Enhanced permeability and retention of macromolecular drugs in solid tumors: A royal gate for targeted anticancer nanomedicines. *J Drug Target*. 2007;15(7):413-44.
- Bae YH, Park K. Targeted drug delivery to tumors: merits, reality and possibility. *J Control Release*. 2011 Aug 18;153(3):289-305.
- Dougherty MC, Zhang XA, Matsuo H. Extravasation of polymeric nanomedicines across tumor vasculature. *Adv Drug Deliv Rev*. In press.
- Haldin C-M, Rubin K, Peters K, Ottens A. High interstitial fluid pressure—an obstacle in cancer therapy. *Nat Rev Cancer*. 2004;4(10):906-11.
- Tong HJ, Boucher Y, Kottmann VV, Winkler E, Hicklin DJ, Jain RK. Vascular normalization by vascular endothelial

- growth factor receptor 2 blockade induces a pressure gradient across the vasculature and improves drug penetration in tumors. *Cancer Res*. 2004 Jan 1;64(1):3713-8.
- Pham A, Boucher Y, Ramanujan S, McKee TD, Gohongi T, di Tomaso E, Brown EB, Iruan Y, Campbell RB, Berk DA, Jain RK. Role of tumor-host interactions in interstitial diffusion of macromolecules: Central vs. subcutaneous tumors. *Proceedings of the National Academy of Sciences of the United States of America*. 2001 April 10, 2001;98(8):4628-33.
  - Majumdar M, Ju S, Velamakanni AS. Enhanced macromolecular diffusion deep in tumors after enzymatic digestion of extracellular matrix collagen and its associated proteoglycan decors. *FASEB J*. 2008 Jan 1;22(2):276-84.
  - Eikenes L, Brindley O, Brindley C, Davies C, L. Collagenase increases the transcapillary pressure gradient and improves the uptake and distribution of macromolecular antibodies in human subcutaneous xenografts. *Cancer Res*. 2004 Jul 15;64(14):4768-73.
  - Goodman TT, Olive PL, Pan SH. Increased nanoparticle penetration in collagenase-treated multicellular spheroids. *Int J Nanomed*. 2007;2(2):265-74.
  - Nien JA, Berk DA, Swartz MA, Greditsky AJ, Jain RK. Role of extracellular matrix assembly in interstitial transport in solid tumors. *Cancer Res*. 2000 May 1;60(9):2467-503.
  - Naves KB, Sawyer AJ, Foley CR, Salzman WM, Olschick WL. Digestion and degradation of the brain extracellular matrix enhances penetration of infused polymer nanoparticles. *Brain Res*. 2007 Nov 14;1180:116-31.
  - McKee TD, Grand P, Mok W, Alexandrakis G, Jain N, Zinner JP, Brewster MG, Boucher Y, Baskfield XO, Jain RK. Degradation of fibrillar collagen in a human melanoma xenograft improves the efficacy of an oncolytic herpes simplex virus vector. *Cancer Res*. 2006 Mar 1;66(5):2509-13.
  - Mok W, Boucher Y, Jain RK. Matrix metalloproteinases-1 and -4 improve the distribution and efficacy of an oncolytic virus. *Cancer Res*. 2007 Nov 15;67(22):10664-8.
  - Diop-Frimpong B, Chaudhry VR, Krane S, Boucher Y, Jain RK. Lovastatin inhibits collagen I synthesis and improves the distribution and efficacy of nanotherapeutics in tumors. *Proc Natl Acad Sci U S A*. 2011 Feb 15;108(7):2909-14.
  - Tharad KM, Cukierman E. Modeling tissue morphogenesis and cancer in 3D. *Cell*. 2007 Aug 24;130(4):800-09.
  - Kim JB. Three-dimensional tissue culture models in cancer biology. *Semin Cancer Biol*. 2005 Oct;15(5):365-77.
  - Burlier E, Kasper TK, Miles AG, Ludwig JA. Engineering tumors: a tissue engineering perspective in cancer biology. *Tissue Eng Part B Rev*. 2010 Jan;16(3):351-9.
  - Sutherland RM. Cell and environment interactions in tumor microregions: the multicell spheroid model. *Science*. 1958 Apr 2;124(4849):237-44.
  - Goodman TT, Chen J, Matwre K, Pan SH. Spatiotemporal modeling of nanoparticle delivery to multicellular tumor spheroids. *Biochemical Biophys*. 2008 Oct 1;100(2):388-99.
  - Faccaro G, Colombini M. Effect of therapeutic macromolecules in spheroids. *Crit Rev Oncol Hematol*. 2000 Nov-Dec;38(2-3):159-78.
  - Hicks EO, Prujin FB, Secomb TW, Hay MP, Hsu R, Brown JM, Dewey RA, Dewhurst MW, Wilson WK. Use of Three-Dimensional Tissue Cultures to Model Extracellular Transport and Predict *In Vivo* Activity of Hypoxia-Targeted Anticancer Drugs. *Journal of the National Cancer Institute*. 2006 18 August 2006;98(18):1118-28.
  - Mok W, Hyde R, Mellor JR, Rasse T, Collington R. Diffusivity and distribution of vincristine in three-dimensional tumor tissue: experimental and mathematical modelling. *Eur J Cancer*. 2006;42(14):2406-13.
  - Kyle AH, Hoshino LA, Chann ASJ, Sun DH, MacIntosh AJ. Direct assessment of drug penetration into tumor using a novel application of three-dimensional cell culture. *Cancer Res*. 2004 Sep 1;64(17):5904-9.
  - Grentham R, Srinivasan S, Tannock IF. The penetration of anticancer drugs through tumor tissue as a function of cellular adhesion and packing density of tumor cells. *Cancer Res*. 2006 Jan 15;66(2):1033-8.
  - Irwin CJ, Phillips KM, Jones PF, Leadman PM, Sleeman RD, Twelves CJ, et al. A mathematical model of doxorubicin penetration through multicellular layers. *J Theoret Biol*. 2008;257(4):593-608.
  - Heemden V, MacNeil S, Barnaglia G. Tracking nanoparticles in three-dimensional tissue-engineered models using confocal laser scanning microscopy. *Methods Mol Biol*. 2011;849:41-51.
  - Del Dura D, Wierhowski T, Del Maestro RF. Spheroid preparation from hanging drops: characterization of a model of brain tumor invasion. *J Neurosurg*. 2004 May;101(3):295-303.
  - Friedrich J, Seidel C, Elhor R, Kuno-Schughart LA. Spheroid-based drug screen: considerations and practical approach. *Nat Protoc*. 2009;4(7):309-24.
  - Yabai JM, Li AP, Martinez AO, Ludwig JA. A simplified method for production and growth of multicellular tumor spheroids. *Cancer Res*. 1977 Oct;37(10):3619-43.
  - Sutherland RM, McCredie JA, Inch WR. Growth of multicell spheroids in tissue culture as a model of nodular carcinoma. *J Natl Cancer Inst*. 1971;46:113-20.
  - Ong S-M, Zhao Z, Arora T, Zhao D, Zhang S, Du T, Warner M, van Noort D, Wu H. Engineering a scaffold-free 3D tumor model for *in vitro* drug penetration studies. *Biomaterials*. 2010;31(8):1180-90.
  - Napolitano AP, Dean DM, Min AJ, Youssef J, Ho DN, Fago AP, Lech MG, Morgan JR. Scaffold-free three-dimensional cell culture utilizing microfluidic nonadhesive hydrogels. *Biostrategies*. 2007 Oct;33(4):494.





- 6-500.
43. Katsenelenos K, Enderfegle D, Papadimitriou A, Yang W-H, Ballagrud AM, Sporn 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):15-27.
44. Katsenelenos K, Enderfegle D, Papadimitriou A, Yang W-H, Ballagrud AM, Sporn G. Binding and intratumoral penetration of liposomes within vascular tumor spheroids. *Int J Cancer*. 2004;112(6):713-21.
45. Tokuda Y, Morimura Y, Hanaguchi T, Kodai H, Matsuyama F, Kakino T. Pharmaceutical and biomedical differences between micellar doxorubicin (DDPII) and liposomal doxorubicin (Doxil). *Jpn J Cancer Res*. 2002 Oct;93(9):1045-53.
46. Du J, Lu W-L, Yang X, Liu Y, Du R, Tian W, Men Y, Gao J, Zhang Y, Li B-J, Zhou J, Liu J-N, Wang J-C, Zhang X, Zhang Q. Dual-Targeting Topotecan Liposomes Modified with Transferrin and Wheat Germ Agglutinin Significantly Improves Drug Transport across the Blood-Brain Barrier and Survival of Brain Tumor-Bearing Animals. *Molecular Pharmaceutics*. 2009;8(3):905-17.
47. White CL, Roth CM. PAMAM-EGD conjugates enhance siRNA delivery through a multicellular spheroid model of malignant glioma. *Bioconjug Chem*. 2008 Oct 21;20(10):1908-16.
48. Oishi M, Nagasaki Y, Nishiyama N, Inaki K, Takagi M, Shimomura A, Furuta Y, Kaneko K. Enhanced Growth Inhibition of Hepatic Multicellular Tumor Spheroids by Lactylated Poly(styrene glycol)-siRNA Conjugates Formulated in PEGylated Polyplexes. *ChemMedChem*. 2007;2(9):1290-7.
49. Saleh AF, Asplund H, Artursson Y, Olfsson S, Akincü M, Pluen A. Improved Dox-mediated plasmid DNA transfer by fusion to LK35 peptide. *J Control Release*. 2010;143(2):131-42.
50. McNeil SR, Davies LA, Capor H, Pringle CR, Hyde SC, Gill DR, Callaghan R. Optimizing non-viral gene delivery in a tumor spheroid model. *The Journal of Gene Medicine*. 2008;10(9):1180-70.
51. Han M, Bae Y, Nishiyama N, Miyata K, Ota M, Kaneko 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):35-48.
52. Al-Ahd AM, Lee SH, Kim SH, Cho J-H, Park TG, Lee SJ, Kim H-J. Penetration and efficacy of VEGF siRNA using polyelectrolyte complex micelles in a human solid tumor model in-vitro. *Journal of Controlled Release*. 2008;137(2):130-5.
53. Gengler 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 8;7(8):2006-19.
54. Bae Y, Nishiyama N, Fukuhara S, Kayama H, Yoshino M, Kaneko 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, Mewar CW, Gombart WF, Pan SH. The delivery of doxorubicin to 3-D multicellular spheroids and tumors in a murine xenograft model using tumor-penetrating ethylenedipolymers: micelles. *Biomaterials*. 2010 Oct;31(26):7186-97.
56. Dhanasekari ES, Aggarwal A, Bouchard J-F, Hilgert P. Methacrylate loaded poly(ether-co-polyester) 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, Qian L, Zhang CC, Peng L. Importance of size-to-charge ratio in construction of stable and uniform nanoparticle RNA-dendrimer complexes. *Org Biomol Chem*. 2007 Nov 21;5(22):3874-81.
58. Ackerman ME, Fiedorowski D, Wirtup KD. Effect of antigen receptor size and expression level on antibody penetration into tumor spheroids. *Mol Cancer Ther*. 2008 Jul;7(7):2231-40.
59. Goff CR, Wirtup KD. Theoretical analysis of antibody targeting of tumor spheroids: importance of design for penetration, and efficacy for retention. *Cancer Res*. 2009 Mar 15;69(9):3385-95.
60. Tharner GM, Wirtup KD. Quantitative spatiotemporal analysis of antibody fragment diffusion and endocytic consumption in tumor spheroids. *Cancer Res*. 2008 May 15;68(9):3334-41.
61. White CL, Roth CM. Binding and transport of PAMAM-EGD in a tumor spheroid model: The effect of EGD targeting ligand density. *Biomaterials*. 2011.
62. Katsenelenos K, Poon A, McKee TD, Brown ER, Boucher Y, Jain RK. Diffusion and convection in collagen pericellular barriers for transport in the tumor interstitium. *Biophys J*. 2002;83(3):1450-60.
63. Marcano-Villa V, Li X, Felix L, Jain RK. Novel in vivo model barriers for evaluation of the permeability of nanomedicine compounds. *Thromb Haemostas*. 2006 Mar;24(2):111-6.
64. Luzzati T, Kneeling F, Hensink WE, Serna G. Nanotherapeutics and image-guided drug delivery: current concepts and future directions. *Mol Pharm*. 2010 Dec 8;7(8):1899-912.
65. Kadar SS, Rensink TM. Therapeutics: combining imaging and therapy. *Bioconjug Chem*. 2011 Oct 19;22(10):1879-903.
66. Ponce AM, Vigliani BL, Yu D, Yarnolovsk P, Michelich CR, Woe J, Bally MB, Dewhurst MW. Magnetic

- Resonance Imaging of Temperature-Sensitive Liposome Release: Drug Dose Printing and Antitumor Effect. *Journal of the National Cancer Institute*. 2007 3 January 2007;99(1):51-63.
67. Vigliani BL, Abraham SA, Michelich CR, Yarnolovsk P, McFall JR, Bally MB, Dewhurst MW. In vivo monitoring of tissue pharmacokinetics of liposome drug using MRI: Illustration of targeted delivery. *Magnetic Resonance in Medicine*. 2004;51(5):1153-62.
68. Vigliani BL, Ponce AM, Michelich CR, Yu D, Abraham SA, Tandon L, Yarnolovsk P, Schroeder T, McFall JR, Barboni DR, Colvin OM, Bally MB, Dewhurst MW. Chemodermatology of in vivo tumor liposomal drug concentration using MRI. *Magnetic Resonance in Medicine*. 2008;59(5):1011-8.
69. Oishi M, Inoue T, Amano D, Kato Y. Noninvasive visualization of in vivo release and intratumoral distribution of nanogels MR contrast agent using the dual MR contrast technique. *Biomaterials*. 2010;31(27):7132-8.
70. Sjöblom U, Almqvist H, Nish M, Tost U, Meier Z, Stenmarkovic D, Kaneko J, Albrecht A. Small unilamellar vesicles: a platform technology for molecular imaging of brain tumors. *Nanotechnology*. 2011 May 12;22(19):195102.
71. Huang B, Lee H, Radly RM, Allen C. noninvasive monitoring of the fate of 111In-labeled block copolymer micelles by high resolution and high sensitivity micro-SPECT/CT imaging. *Mol Pharm*. 2009;6(2):381-92.
72. Thiagarajah JR, Kim JK, Magrath M, Velazquez AS. Slowed diffusion in tumors revealed by microfluidic epifluorescence photobleaching. *Nat Methods*. 2008 Apr;5(4):275-80.
73. Nakamura T, Norberg SM, Shalinsky DR, Ho-Lew DD, McDonald DM. Effect of inhibition of vascular endothelial growth factor signaling on distribution of extravasated antibodies in tumors. *Cancer Res*. 2006 Feb 15;66(3):1404-15.
74. Tan YF, Chandrasekharan R, Maury D, Yang CX, Chung KH, Zhao Y, Wang S, Ding J, Peng 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 ER, Boucher Y, Nasser S, Jain RK. Measurement of macromolecular diffusion coefficients in human tumors. *Microvasc Res*. 2004;67(3):231-6.
76. Wu HZ, Kitzman B, Foster G, Neelands D, Dewhurst MW. Measurement of material extravasation in microvascular networks using fluorescence video-microscopy. *Microvasc Res*. 2003 Sep;66(2):231-53.
77. Brown ER, Campbell RB, Tazuke Y, Yu L, Camillet R, 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):834-8.
78. Alexandrakis G, Brown ER, Tang RE, 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):201-7.
79. Sirok M, Ziemer JP, Duda DG, Lavchenko TS, Cohen KS, Brown ER, Scadden DT, Teichgraber VR, Bowdler MG, Fukumura D, Jain RK. Quantum dots spectrally distinguish multiple species within the tumor milieu in vivo. *Nat Med*. 2005 Jun;11(6):675-82.
80. Anagnostouliou P, Mavroukas A, Weiger 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. South BR, Cheng Z, De A, Koh AL, Sinclair R, Goshima SS. Real-time intravital imaging of ratiometric dye binding to human endothelium in mouse tumor neovasculature. *Nano Lett*. 2008;8(9):2599-606.
82. Tada H, Higuchi H, Watanabe TM, Okuchi N. In vivo real-time tracking of single quantum dots conjugated with monoclonal anti-HER2 antibody in tumors of mice. *Cancer Res*. 2007 Feb 15;67(3):1138-44.
83. Blarke AA, Paul V, Gervais J, Zhang G, Serna AA, Mavroukas A, Lapanis ED, Weiger R, Goshima SS, Rindig JP. 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. Radly ST, Bek DA, Jain RK, Swartz MA. A sensitive in vivo model for quantifying intratumoral convective transport of injected macromolecules and nanoparticles. *J Appl Physiol*. 2006 Oct 1;101(4):1145-9.
85. Fujimori K, Cecchi DG, Fletcher JE, Weisman JN. A modeling analysis of monoclonal antibody percolation through tumors: a binding-site barrier. *J Nucl Med*. 1990 Jul;31(7):1181-8.
86. Sato T, Weisman JN, Hays T, Sato J, Kinjo S, Le N, Park CH, Weisman JN. Targeting cancer microvasculature with monoclonal antibodies: a binding-site barrier. *Proc Natl Acad Sci U S A*. 1995 Sep 12;92(18):8999-9003.
87. Tharner GM, Zupic SC, Wirtup KD. Theoretical criteria for antibody penetration into solid tumors and microvasculature. *J Nucl Med*. 2007 Jun;48(6):995-9.
88. Schaub MM, Wirtup KD. A modeling analysis of the effects of molecular size and binding affinity on tumor targeting. *Mol Cancer Ther*. 2009 Oct 15;8(10):2681-71.
89. Tindorf AP, Levin AD, Edelman ER. Diffusion-limited binding explains binary dose response for local arterial and tumor drug delivery. *Cell Prolif*. 2009 Jun;42(3):345-63.
90. Su D, Mo R, Sallman M, Zhu L. Multi-scale study of nanoparticle transport and deposition in tumors during an injection process. *Med Biol Engin Comput*. 2010;48(7):451-63.

91. Jain RK. Delivery of molecular and cellular medicines to solid tumors. *Adv Drug Deliv Rev*. 2001 Mar 1;49(1-3):149-88.
92. Tharner GM, Schacht MM, Wirtup ED. Factors determining antibody distribution in tumors. *Trends Pharmacol Sci*. 2008 Feb;29(2):57-61.
93. Tharner GM, Schacht MM, Wirtup ED. Antibody tumor penetration: transport opposed by systemic and antigen-mediated clearance. *Adv Drug Deliv Rev*. 2008 Sep;60(12):1421-34.
94. Zlotod C, Kew M, Strupp ME, de Pasquale C, Danilovici F, Nagy-Davies G, Tresser B, Ichida R, Buz 90C, Weibel R, Pluckhahn A. Efficient Tumor Targeting with High-Affinity Designed Antikins. *Expert Review: Effects of Affinity and Molecular Size*. *Cancer Research*. 2010 February 15; 70(4):1595-605.
95. Bryce NS, Zhang JZ, Whan RM, Yamasaki N, Hambley TW. Accumulation of an antineoplastic and its platinum complex in cancer cell spheroids: the effect of charge on drug distribution in solid tumor models. *Chem Commun*. 2009(19):2473-5.
96. Kawan M, Higuchi H, Takeda M, Kohyashi Y, Otsuchi N. Dynamics of different-sized solid-state nanocrytals as vectors for a drug-delivery system in the interstium of a human tumor xenograft. *Breast Cancer Res*. 2009;11(4):R43.
97. Miyayama K. Intracellular targeting delivery of liposomal drugs to solid tumors based on EPR effects. *J Control Release*. 2011;157:181-9.
98. Dowl [Package Insert]. Ortho Biotech. Raritan, NJ2008.
99. Yuan F, Leung M, Huang SK, Berk DA, Papadopoulos D, Jain RK. Microvascular permeability and interstitial penetration of sterically stabilized (ssw) liposomes in a human tumor xenograft. *Cancer Res*. 1994 Jul 1;54(13):3353-6.
100. Usuki S, Miyayama K, Hosoda M, Nagai I, Koyanagi Y, Nakata M, Ishida O, Iwamura M, Tsuchiya S. Direct measurement of the extravasation of polyethylene glycol-coated liposomes into solid tumor tissue by in vivo fluorescence microscopy. *International Journal of Pharmaceutics*. 1998;144(1):11-7.
101. Tang N, Du G, Wang N, Liu C, Hong H, Liang W. Improving penetration in tumors with nanossemblies of phospholipids and dendritic. *J Nat Cancer Inst*. 2007 Jul 4;99(13):1064-13.
102. Tharner G, McLennan JW, Rizer M, Bink R, Nield A, Marpley TT, Haulman D, McDonald DM. Cationic liposomes target angiogenic endothelial cells in tumors and chemically induce tumor necrosis. *The Journal of Clinical Investigation*. 1998;102(7):1405-13.
103. Krasnow S, Winer A, Eichhorn ME, Schmitt-Jody M, Pabonik SA, Sauer B, Schulte B, Teidel M, Michaelis U, Nijole K, DeLam M. Effect of the surface charge of liposomes on their uptake by angiogenic tumor vessels. *International Journal of Cancer*. 2003;105(4):563-7.
104. Pedrosa de Lima MC, Simões S, Pires R, Feresca R, Dargatzis N. Cationic lipid-DNA complexes in gene delivery: from biophysics to biological applications. *Adv Drug Deliv Rev*. 2001;47(2-3):277-94.
105. Campbell EB, Fukumura D, Brown EB, Mizutani LM, Imani Y, Jain RK, Torchilo VP, Mann LL. Cationic Charge Determines the Distribution of Liposomes between the Vascular and Extravascular Compartments of Tumors. *Cancer Research*. 2003 December 1; 63(24):8631-6.
106. Ho EA, Kassar E, Gay M, Anand M, Beegum I, Sy J, Woe J, Ochoy-Talsh M, Yapp DT, Bally MB. Characterization of cationic liposome formulations designed to exhibit extended plasma residence times and tumor vasculature targeting properties. *Journal of Pharmaceutical Sciences*. 2010;99(9):2836-53.
107. Abu Lila AS, Kizaki S, Dai Y, Suzuki T, Ishida T, Kawauchi H. Ovalbumin encapsulated in PEG-coated cationic liposomes induces significant tumor growth suppression via a dual-targeting approach in a murine solid tumor model. *J Control Release*. 2009;137(1):8-14.
108. Abu Lila AS, Dai Y, Nakamura K, Ishida T, Kawauchi H. Sequential administration with ovalbumin-containing PEG-coated cationic liposomes promotes a significant delivery of subsequence dose into murine solid tumor. *J Control Release*. 2010;142(2):167-73.
109. Kang G, Brown RD, Dewhurst MW. Hyperthermia enables tumor-specific nanoparticle delivery: effect of particle size. *Cancer Res*. 2009 Aug 15;69(16):4440-5.
110. Kang G, Brown RD, Dewhurst MW. Characterization of the effect of hyperthermia on nanoparticle extravasation from tumor vasculature. *Cancer Res*. 2001 Apr 1;61(7):3027-31.
111. Alvarez Secord A, Jemel EL, Hahn CA, Peters WR, Ye D, Hurdleby LJ, Soper JT, Berchuck A, Sparano J, Clarke-Pearson DL, Pressman LR, Dewhurst MW. Phase I/II trial of intravenous Doxil and whole abdomen hyperthermia in patients with refractory ovarian cancer. *International Journal of Hyperthermia*. 2005;21:333-47.
112. Kaneko K, Nishida A, Nagasaki Y. Block copolymer micelles for drug delivery: design, characterization and biological significance. *Adv Drug Deliv Rev*. 2001 Mar 23;47(1):113-31.
113. Nishiyama N, Kaneko K. Current state, achievements, and future prospects of polymeric micelles as nanocarriers for drug and gene delivery. *Pharmacol Ther*. 2006 Dec;112(3):630-48.
114. Milled AS, Allen C. Block copolymer micelles for delivery of cancer therapy: transport at the whole body, tumor and cellular levels. *J Control Release*. 2009 Sep 15;138(2):214-23.
115. Chen KY, Min KH, Yoon HY, Kim K, Park JH, Kwon KC, Choi K, Jeong SY. PEGylation of lyophilized acid nanoparticles improves tumor susceptibility in vivo. *Biomaterials*. 2011;32(7):1890-9.

116. Tullias A, Jackson J, Barr H. The uptake of paclitaxel and docetaxel into *in vivo* porcine bladder tissue from polymeric micelle formulations. *Cancer Chemother Pharmacol*. 2010;1-14.
117. Xiao K, Luo J, Fowler WL, Li Y, Lee JS, Xing L, Cheng RH, Wang L, Lam KS. A self-assembling nanoparticle for paclitaxel delivery in ovarian cancer. *Biomaterials*. 2009;30(30):8006-16.
118. Lee H, Feng H, Huang B, Reilly RM, Allen C. The effects of particle size and molecular targeting on the interstitial and subcellular distribution of polymeric nanoparticles. *Mol Pharm*. 2010 Aug 2;7(4):1195-208.
119. Lee H, Huang B, Feng H, Reilly RM, Allen C. In vivo distribution of polymeric nanoparticles in the whole body, tumor, and cellular levels. *Pharm Res*. 2010 Nov;27(11):2343-55.
120. Chen Y, Chen BA. Application and advancement of magnetic iron-oxide nanoparticles in tumor-targeted therapy. *Chin J Cancer*. 2010 Jan;39(1):125-8. [In Chinese.]
121. Daniel M-C, Astruc D. Gold nanoparticles: assembly, supramolecular chemistry, quantum-size-related properties, and applications toward biology, catalysis, and nanotechnology. *Chem Rev*. 2003;104(1):293-346.
122. Razzay D, Astruc D, Daulty P, Daulty E, Mounier R, Kulkarni R, Singh G, et al. Dendritic carriers for nanoscale transport targeting, deep tumor penetration and improved therapy. *J Control Release*. 2005;109(1-2):223-35.
123. Kang SD, Zhang W, Lee JR, Brummer K, Lai R, Karin M, Jin Y. Magnetically Vectored Nanoparticles for Tumor Penetration and Remotely Switchable On-Demand Drug Release. *Nano Letters*. 2010;10(12):5083-92.
124. Zhang G, Tang Z, Lu W, Zhang R, Huang Q, Tian M, Li L, Liang D, Li C. Influence of anchoring ligands and particle size on the colloidal stability and in vivo biotransformation of polyethylene glycol-coated gold nanoparticles in tumor-xenografted mice. *Biomaterials*. 2009 Apr;30(15):1928-38.
125. Larven EKK, Nalini T, Wimbush T, Bihadi H, Vemp-Narasimhan T, Mahesh M, Gnanapavan L, Harman MR, Beneshcher F, Howard KA, Kopp J. Size-Dependent Accumulation of PEGylated Silica-Coated Magnetic Iron Oxide Nanoparticles in Murine Tumors. *ACS Nano*. 2009;3(7):1047-51.
126. Kohn SJ, Panch SK, Malhotra DE, George TD. Proteolytic surface functionalization enhances in vivo magnetic nanoparticle mobility through extracellular matrix. *Nano Letters*. 2006;6(2):305-12.
127. Rowland MJ, Sore-Shang P, Davis N. Protein nanoparticles as drug carriers in clinical medicine. *Adv Drug Deliv Rev*. 2008 May 22;60(5):576-85.
128. Ding D, Zhu Z, Liu Q, Wang J, Hu Y, Jiang X, Liu B. Cisplatin-loaded gelatin-poly(N-vinyl pyrrolidone) nanoparticles improves tumor susceptibility in vivo. *Biomaterials*. 2011;32(7):1890-9.
129. Kamaul PR, Kottamuru VR, Kottamuru M, Black M, Mizutani D, Tarek M, Rasoulali E. Targeting of albumin-embedded paclitaxel nanoparticles to tumors. *Nanomedicine nanotechnology, biology, and medicine*. 2009;3(2):71-82.
130. Wong C, Stylianopoulos T, Cai J, Martin J, Chaudhary VR, Jiang W, Popovic Z, Jain RK, Breward MO, Fukumura D. Multistage nanoparticle delivery system for deep penetration into tumor tissue. *Proc Natl Acad Sci U S A*. 2011 Feb 8;108(8):2436-41.
131. Mottle M, Pissinatti C, Vignatour A, Clavard A, Besser JP. Progress in developing cationic vectors for non-viral systemic gene therapy against cancer. *Biomaterials*. 2008 Aug-Sep;29(24-25):3477-95.
132. Roth CM, Sanderus S. Engineering synthetic vectors for improved DNA delivery: insights from intracellular pathways. *Ann Rev Biomed Eng*. 2004;4:397-426.
133. Blase NS, Gery KS, Sankhane JC, Hsu S, David AJ, Green JJ. The relationship between terminal functionalization and molecular weight of a gene delivery polymer and transfection efficacy in mammary epithelial 3-D cultures and 3-D organotypic cultures. *Biomaterials*. 2010 Nov;31(31):8088-96.
134. Sugihara KN, Terasaki T, Kamaul PR, Kottamuru VR, Agency L, Gnanapavan M, Rasoulali E. Co-administration of a Tumor-Penetrating Peptide Enhances the Efficacy of Cancer Drugs. *Science*. 2010 May 21; 328(5912):1031-5.
135. Jain RK. Normalizing tumor vasculature with anti-angiogenic therapy: a new paradigm for combination therapy. *Nat Med*. 2001 Sep;7(9):987-9.
136. Jain RK. Normalization of tumor vasculature: an emerging concept in antiangiogenic therapy. *Science*. 2001 Jan 7;293(5476):58-62.
137. Gnanapavan M, Robinson M, Yan CO, Jooi K. Relaxin-expressing fiber channels: ex vivo and in vivo models for survival of tumor-bearing mice. *Cancer Res*. 2007 May 1;67(9):4399-407.
138. Kim HK, Lee YS, Kim H, Huang JH, Yoon AR, Yan CO. Relaxin expression from tumor-targeting adenovirus and its antitumor effect, apoptosis induction, and efficacy. *J Natl Cancer Inst*. 2008 Oct 15;98(20):1423-31.
139. Perillo KF, Chang EH. Does a targeting ligand influence nanoparticle tumor localization or uptake? *Trends Biotechnol*. 2008;26(1):512-8.

共143篇相关内容参考文献



# 生物医学特色期刊系列

1



## 水生生物学期刊

期刊翻译了俄罗斯和东欧在水生生物和水生生态系统方面的文献，是**全球唯一**覆盖水生生物学的两本刊中一本（另外一本被 Springer 收录）

2



## 国际药用蘑菇期刊

这本期刊是**唯一一本**集中收录药用蘑菇生物特性、工业和药物应用方面研究的期刊，它将所有这方面的信息汇集到一起，帮助读者跟踪相关领域的研究和实践。在该领域没有其他出版物可替代。

3



## 藻类学国际期刊

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、核磁共振技术，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。

5



## 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个月有一期待刊。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。



# 感谢您的观看

BEGELL HOUSE. INC

中国教育图书进出口有限公司  
2025年2月

