

Microfluidics And Nanofluidics Journal

Microelectromechanical Systems
Journal of Thermophysics and Heat Transfer
T.&A.M. Report
Manufacturing Technology, Electronics, Computer and Information Technology Applications
Microfluidics and Nanofluidics Handbook
Design Considerations for Micro Wave Disc Engines
Optofluidics
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Complex Fluid-Flows in Microfluidics
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Microfluidics and Nanofluidics Handbook, 2 Volume Set
Polymers for PEM Fuel Cells
Issues in Nanotechnology and Micotechnology—Materials and Molecular Research: 2012 Edition
Electrokinetics in Microfluidics
Micro- and Nanoscale Fluid Mechanics
Proceedings of the 4th International Conference on Nanochannels, Microchannels and Minichannels-- 2006
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Fundamentals and Applications of Microfluidics, Third Edition
Electrokinetically-Driven Microfluidics and Nanofluidics
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Engineering Solutions for Manufacturing Processes
Transfer Phenomena in Fluid and Heat Flows
XIMicro/Nano-Chip Electrokinetics
The Physics of Microdroplets
Issues in Nanotechnology and Micotechnology: Materials and Molecular Research: 2011 Edition
Canadian Journal of Chemistry

Microelectromechanical Systems

Journal of Thermophysics and Heat Transfer

T.&A.M. Report

The topics covered in this special issue are related to the research of the phenomena of heat and mass transfer in the various areas of engineering and range from mathematics models and methods of numerical analysis of heat and mass transfer processes in generalized technical systems to the development of technologies in food and biomass processing and creation of real technical solutions in mechanical engineering.

Manufacturing Technology, Electronics, Computer and Information Technology Applications

To provide an interdisciplinary readership with the necessary toolkit to work with micro- and nanofluidics, this book provides basic theory, fundamentals of

microfabrication, advanced fabrication methods, device characterization methods and detailed examples of applications of nanofluidics devices and systems. Case studies describing fabrication of complex micro- and nanoscale systems help the reader gain a practical understanding of developing and fabricating such systems. The resulting work covers the fundamentals, processes and applied challenges of functional engineered nanofluidic systems for a variety of different applications, including discussions of lab-on-chip, bio-related applications and emerging technologies for energy and environmental engineering. The fundamentals of micro- and nanofluidic systems and micro- and nanofabrication techniques provide readers from a variety of academic backgrounds with the understanding required to develop new systems and applications. Case studies introduce and illustrate state-of-the-art applications across areas, including lab-on-chip, energy and bio-based applications. Prakash and Yeom provide readers with an essential toolkit to take micro- and nanofluidic applications out of the research lab and into commercial and laboratory applications.

Microfluidics and Nanofluidics Handbook

Design Considerations for Micro Wave Disc Engines

The Microfluidics and Nanofluidics Handbook: Two-Volume Set comprehensively captures the cross-disciplinary breadth of micro- and nanofluidics, which encompass the biological sciences, chemistry, physics and engineering applications. To fill the knowledge gap between engineering and the basic sciences, the editors pulled together key individuals, well known in their respective areas, to author chapters that help graduate students, scientists, and practicing engineers understand the overall area of microfluidics and nanofluidics. Highlights

- Discusses basic microbiology and chemistry related to microfluidics
- Explains fabrication techniques
- Emphasizes applications of microfluidics in the energy sector
- Describes micro-fuel cells and lab-on-a-chip
- Presents example tables, graphs, and equations
- Covering physics and transport phenomena along with life sciences and related applications, Volume One: Chemistry, Physics, and Life Science Principles provides readers with the fundamental science background that are required for the study of microfluidics and nanofluidics. Volume Two: Fabrication, Implementation, and Applications focuses on topics related to experimental and numerical methods, followed by chapters on fabrications and other applications, ranging from aerospace to biological systems. Both volumes include as much interdisciplinary knowledge as possible to reflect the inherent nature of this area, making them valuable to students and practitioners.

Optofluidics

The Physics of Microdroplets gives the reader the theoretical and numerical tools to understand, explain, calculate, and predict the often nonintuitive observed behavior of droplets in microsystems. Microdrops and interfaces are now a common feature in most fluidic microsystems, from biology, to biotechnology, materials science, 3D-microelectronics, optofluidics, and mechatronics. On the other hand, the behavior of droplets and interfaces in today's microsystems is

complicated and involves complex 3D geometrical considerations. From a numerical standpoint, the treatment of interfaces separating different immiscible phases is difficult. After a chapter dedicated to the general theory of wetting, this practical book successively details: The theory of 3D liquid interfaces The formulas for volume and surface of sessile and pancake droplets The behavior of sessile droplets The behavior of droplets between tapered plates and in wedges The behavior of droplets in microchannels The effect of capillarity with the analysis of capillary rise The onset of spontaneous capillary flow in open microfluidic systems The interaction between droplets, like engulfment The theory and application of electrowetting The state of the art for the approach of 3D-microelectronics using capillary alignment

Proceedings of the ASME Heat Transfer Division--2005

Complex Fluid-Flows in Microfluidics

Volume is indexed by Thomson Reuters CPCI-S (WoS). The papers of this 3 volumes set on □Engineering Solutions for Manufacturing Processes□ are grouped as follows: Chapter 1: Parts of Machines and Mechanisms. Design, Analysis and Simulation; Chapter 2: Sensors, Measurement and Detection; Chapter 3: Data Acquisition and Data Processing, Computational Techniques; Chapter 4: Mechatronics and Robotics; Chapter 5: Advanced NC Techniques and Equipment; Chapter 6: Control and Automation; Chapter 7: Electronics/Microelectronics Technology; Chapter 8: Advanced Decisions for Automatic Manufacturing; Chapter 9: Information Processing Technologies; Chapter 10: Technologies in Architecture and Construction; Chapter 11: Technologies and Equipment in Medicine; Chapter 12: Technologies in Food Industry and Agriculture; Chapter 13: Products Design; Chapter 14: Engineering Education; Chapter 15: Economics, Marketing and Engineering Management.

Microfluidics for Medical Applications

This comprehensive handbook presents fundamental aspects, fabrication techniques, introductory materials on microbiology and chemistry, measurement techniques, and applications of microfluidics and nanofluidics. The second volume focuses on topics related to experimental and numerical methods. It also covers fabrication and applications in a variety of areas, from aerospace to biological systems. Reflecting the inherent nature of microfluidics and nanofluidics, the book includes as much interdisciplinary knowledge as possible. It provides the fundamental science background for newcomers and advanced techniques and concepts for experienced researchers and professionals.

Microfluidics and Nanofluidics Handbook, 2 Volume Set

How to use nuclear magnetic resonance imaging in chemical engineering. Written by the internationally recognized top experts from academia and industry, this first book dedicated to the topic provides an overview of existing methods and strategies to solve individual problems in chemical engineering. Written in a simple

and lively manner and backed by various industrial examples, the book begins with a look at hardware and methods, continuing on to cover porous materials, fluids and flow of increasing complexity from different fields of Chemical Engineering, before finishing off with a review of reactors and reactions. The result allows engineers, industrial and academic researchers and decision-makers to gain a detailed insight into the NMR toolbox, such that they can estimate the benefit of NMR imaging with regard to cost efficiency and scientific results.

Polymers for PEM Fuel Cells

A lab-on-a-chip device is a microscale laboratory on a credit-card sized glass or plastic chip with a network of microchannels, electrodes, sensors and electronic circuits. These labs on a chip can duplicate the specialized functions as performed by their room-sized counterparts, such as clinical diagnoses, PCR and electrophoretic separation. The advantages of these labs on a chip include significant reduction in the amounts of samples and reagents, very short reaction and analysis time, high throughput and portability. Generally, a lab-on-a-chip device must perform a number of microfluidic functions: pumping, mixing, thermal cycling/incubating, dispensing, and separating. Precise manipulation of these microfluidic processes is key to the operation and performance of labs on a chip. The objective of this book is to provide a fundamental understanding of the interfacial electrokinetic phenomena in several key microfluidic processes, and to show how these phenomena can be utilised to control the microfluidic processes. For this purpose, this book emphasises the theoretical modelling and the numerical simulation of these electrokinetic phenomena in microfluidics. However, experimental studies of the electrokinetic microfluidic processes are also highlighted in sufficient detail. The first book which systematically reviews electrokinetic microfluidics processes for lab-on-a chip applications Covers modelling and numerical simulation of the electrokinetic microfluidics processes Providing information on experimental studies and details of experimental techniques, which are essential for those who are new to this field

Issues in Nanotechnology and Micotechnology—Materials and Molecular Research: 2012 Edition

Fluidics originated as the description of pneumatic and hydraulic control systems, where fluids were employed (instead of electric currents) for signal transfer and processing. Microfluidics and Nanofluidics: Theory and Selected Applications offers an accessible, broad-based coverage of the basics through advanced applications of microfluidics and nanofluidics. It is essential reading for upper-level undergraduates and graduate students in engineering and professionals in industry.

Electrokinetics in Microfluidics

Micro- and Nanoscale Fluid Mechanics

Proceedings of the 4th International Conference on Nanochannels, Microchannels and Minichannels-- 2006

Journal of Scientific and Industrial Research

Fundamentals and Applications of Microfluidics, Third Edition

Including chemical, synthetic, and cross-disciplinary approaches; this book includes the necessary techniques and technologies to help readers better understand polymers for polymer electrolyte membrane (PEM) fuel cells. The methods in the book are essential to researchers and scientists in the field and will lead to further development in polymer and fuel cell technologies. • Provides complete, essential, and comprehensive overview of polymer applications for PEM fuel cells • Emphasizes state-of-the-art developments and methods, like PEMs for novel fuel cells and polymers for fuel cell catalysts • Includes detailed chapters on major topics, like PEM for direct liquid fuel cells and fluoropolymers and non-fluorinated polymers for PEM • Has relevance to a range of industries – like polymer engineering, materials, and green technology – involved with fuel cell technologies and R&D

Electrokinetically-Driven Microfluidics and Nanofluidics

The third, partly revised and enlarged edition of this introductory reference summarizes the terms and definitions, most important phenomena, and regulations occurring in the physics, chemistry, technology, and application of nanostructures. A representative collection of fundamental terms and definitions from quantum physics and chemistry, special mathematics, organic and inorganic chemistry, solid state physics, material science and technology accompanies recommended secondary sources for an extended study of any given subject. Each of the more than 2,200 entries, from a few sentences to a page in length, interprets the term or definition in question and briefly presents the main features of the phenomena behind it. Additional information in the form of notes ("First described in", "Recognition", "More details in") supplements the entries and gives a historical perspective of the subject with reference to further sources. Ideal for answering questions related to unknown terms and definitions among undergraduate and PhD students studying the physics of low-dimensional structures, nanoelectronics, and nanotechnology.

Microfluidics and Nanofluidics

Heat exchangers with minichannel and microchannel flow passages are becoming increasingly popular due to their ability to remove large heat fluxes under single-phase and two-phase applications. Heat Transfer and Fluid Flow in Minichannels and Microchannels methodically covers gas, liquid, and electrokinetic flows, as well as flow boiling and condensation, in minichannel and microchannel applications. Examining biomedical applications as well, the book is an ideal reference for anyone involved in the design processes of microchannel flow passages in a heat

exchanger. Each chapter is accompanied by a real-life case study New edition of the first book that solely deals with heat and fluid flow in minichannels and microchannels Presents findings that are directly useful to designers; researchers can use the information in developing new models or identifying research needs

Library Journal

From the Introduction: Nanotechnology and its underpinning sciences are progressing with unprecedented rapidity. With technical advances in a variety of nanoscale fabrication and manipulation technologies, the whole topical area is maturing into a vibrant field that is generating new scientific research and a burgeoning range of commercial applications, with an annual market already at the trillion dollar threshold. The means of fabricating and controlling matter on the nanoscale afford striking and unprecedented opportunities to exploit a variety of exotic phenomena such as quantum, nanophotonic and nanoelectromechanical effects. Moreover, researchers are elucidating new perspectives on the electronic and optical properties of matter because of the way that nanoscale materials bridge the disparate theories describing molecules and bulk matter. Surface phenomena also gain a greatly increased significance; even the well-known link between chemical reactivity and surface-to-volume ratio becomes a major determinant of physical properties, when it operates over nanoscale dimensions. Against this background, this comprehensive work is designed to address the need for a dynamic, authoritative and readily accessible source of information, capturing the full breadth of the subject. Its six volumes, covering a broad spectrum of disciplines including material sciences, chemistry, physics and life sciences, have been written and edited by an outstanding team of international experts. Addressing an extensive, cross-disciplinary audience, each chapter aims to cover key developments in a scholarly, readable and critical style, providing an indispensable first point of entry to the literature for scientists and technologists from interdisciplinary fields. The work focuses on the major classes of nanomaterials in terms of their synthesis, structure and applications, reviewing nanomaterials and their respective technologies in well-structured and comprehensive articles with extensive cross-references. It has been a constant surprise and delight to have found, amongst the rapidly escalating number who work in nanoscience and technology, so many highly esteemed authors willing to contribute. Sharing our anticipation of a major addition to the literature, they have also captured the excitement of the field itself in each carefully crafted chapter. Along with our painstaking and meticulous volume editors, full credit for the success of this enterprise must go to these individuals, together with our thanks for (largely) adhering to the given deadlines. Lastly, we record our sincere thanks and appreciation for the skills and professionalism of the numerous Elsevier staff who have been involved in this project, notably Fiona Geraghty, Megan Palmer and Greg Harris, and especially Donna De Weerd-Wilson who has steered it through from its inception. We have greatly enjoyed working with them all, as we have with each other.

Nanofluidics and Microfluidics

Heat Transfer and Fluid Flow in Minichannels and Microchannels

This introduction into the multidisciplinary area of optofluidics offers the necessary foundations in photonics, polymer physics and process analytics to students, engineers and researchers to enter the field. All basic ingredients of a polymer-based platform as a foundation for quick and compact solutions for chemical, biological and medical sensing and manipulation are developed.

NMR Imaging in Chemical Engineering

Now in its Third Edition, the Artech House bestseller, Fundamentals and Applications of Microfluidics, provides engineers and students with the most complete and current coverage of this cutting-edge field. This revised and expanded edition provides updated discussions throughout and features critical new material on microfluidic power sources, sensors, cell separation, organ-on-chip and drug delivery systems, 3D culture devices, droplet-based chemical synthesis, paper-based microfluidics for point-of-care, ion concentration polarization, micro-optofluidics and micro-magnetofluidics. The book shows how to take advantage of the performance benefits of microfluidics and serves as an instant reference for state-of-the-art microfluidics technology and applications. Readers find discussions on a wide range of applications, including fluid control devices, gas and fluid measurement devices, medical testing equipment, and implantable drug pumps. Professionals get practical guidance in choosing the best fabrication and enabling technology for a specific microfluidic application, and learn how to design a microfluidic device. Moreover, engineers get simple calculations, ready-to-use data tables, and rules of thumb that help them make design decisions and determine device characteristics quickly.

Nanofluidics and Microfluidics

This monograph contains expert knowledge on complex fluid-flows in microfluidic devices. The topical spectrum includes, but is not limited to, aspects such as the analysis, experimental characterization, numerical simulations and numerical optimization. The target audience primarily comprises researchers who intend to embark on activities in microfluidics. The book can also be beneficial as supplementary reading in graduate courses.

Current Serials Received

This book is a printed edition of the Special Issue "Micro/Nano-Chip Electrokinetics" that was published in Micromachines

What is What in the Nanoworld

High Refractive-index-contrast Silicon Planar Photonics for Life Science Applications

The past two decades have seen rapid development of micro-/nanotechnologies with the integration of chemical engineering, biomedical engineering, chemistry, and life sciences to form bio-MEMS or lab-on-chip devices that help us perform cellular analysis in a complex micro-/nanofluidic environment with minimum sample consumption and have potential biomedical applications. To date, few books have been published in this field, and researchers are unable to find specialized content. This book compiles cutting-edge research on cell manipulation, separation, and analysis using microfluidics and bio-MEMS devices. It illustrates the use of micro-robots for biomedical applications, vascularized microfluidic organs-on-a-chip and their applications, as well as DNA gene microarray biochips and their applications. In addition, it elaborates on neuronal cell activity in microfluidic compartments, microvasculature and microarray gene patterning, different physical methods for drug delivery and analysis, micro-/nanoparticle preparation and separation in a micro-/nanofluidic environment, and the potential biomedical applications of micro-/nanoparticles. This book can be used by academic researchers, especially those involved in biomicrofluidics and bio-MEMS, and undergraduate- and graduate-level students of bio-MEMS/bio-nanoelectromechanical systems (bio-NEMS), biomicrofluidics, biomicrofabrication, micro-/nanofluidics, biophysics, single-cell analysis, bionanotechnology, drug delivery systems, and biomedical micro-/nanodevices. Readers can gain knowledge of different aspects of microfluidics and bio-MEMS devices; their design, fabrication, and integration; and biomedical applications. The book will also help biotechnology-based industries, where research and development is ongoing in cell-based analysis, diagnosis, and drug screening.

Comprehensive Nanoscience and Technology

Microfluidics and Nanofluidics

Issues in Nanotechnology and Micotechnology—Materials and Molecular Research: 2012 Edition is a ScholarlyPaper™ that delivers timely, authoritative, and intensively focused information about Fluids Research in a compact format. The editors have built Issues in Nanotechnology and Micotechnology—Materials and Molecular Research: 2012 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Fluids Research in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Nanotechnology and Micotechnology—Materials and Molecular Research: 2012 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Proceedings of the ASME Heat Transfer Division

Issues in Nanotechnology and Micotechnology: Materials and Molecular Research:

2011 Edition is a ScholarlyBrief™ that delivers timely, authoritative, comprehensive, and specialized information about Nanotechnology and Micotechnology—Materials and Molecular Research in a concise format. The editors have built Issues in Nanotechnology and Micotechnology: Materials and Molecular Research: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Nanotechnology and Micotechnology—Materials and Molecular Research in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Nanotechnology and Micotechnology: Materials and Molecular Research: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Proceedings of the ASME Process Industries Division, : Presented at the ASME Mechanical Engineering Congress and Exposition,

In the present book, various applications of microfluidics and nanofluidics are introduced. Microfluidics and nanofluidics span a broad array of disciplines including mechanical, materials, and electrical engineering, surface science, chemistry, physics and biology. Also, this book deals with transport and interactions of colloidal particles and biomolecules in microchannels, which have great importance to many microfluidic applications, such as drug delivery in life science, microchannel heat exchangers in electronic cooling, and food processing industry. Furthermore, this book focuses on a detailed description of the thermal transport behavior, challenges and implications that involve the development and use of HTFs under the influence of atomistic-scale structures and industrial applications.

Microfluidics and Bio-MEMS

Includes, beginning Sept. 15, 1954 (and on the 15th of each month, Sept.-May) a special section: School library journal, ISSN 0000-0035, (called Junior libraries, 1954-May 1961). Also issued separately.

Library Journal

Engineering Solutions for Manufacturing Processes

Lab-on-a-chip devices for point of care diagnostics have been present in clinics for several years now. Alongside their continual development, research is underway to bring the organs and tissue on-a-chip to the patient, amongst other medical applications of microfluidics. This book provides the reader with a comprehensive review of the latest developments in the application of microfluidics to medicine and is divided into three main sections. The first part of the book discusses the

state-of-the-art in organs and tissue on a chip; the second provides a thorough background to microfluidics for medicine, and the third (and largest) section provides numerous examples of point-of-care diagnostics. Written with students and practitioners in mind, and with contributions from the leaders in the field across the globe, this book provides a complete digest of the state-of-the-art in microfluidics medical devices and will provide a handy resource for any laboratory or clinic involved in the development or application of such devices.

Transfer Phenomena in Fluid and Heat Flows XI

Collection of selected, peer reviewed papers from the 2014 International Conference on Manufacturing Technology and Electronics Applications (ICMTEA 2014), November 8-9, 2014, Taiyuan, Shanxi, China. The 1181 papers are grouped as follows: Chapter 1: Researching and Designing in Mechanical Engineering, Mechatronics, Automation and Control, Chapter 2: Measurement and Instrumentation, Monitoring, Testing and Detection Technologies, Chapter 3: Numerical Methods, Computation Methods and Algorithms for Modeling, Simulation and Optimization, Data Mining and Data Processing, Chapter 4: Information Technologies, WEB and Networks Engineering, Information Security, Software Application and Development, E-Applications, Chapter 5: Electronics and Microelectronics, Embedded and Integrated Systems, Smart Grids, Power and Energy, Electric and Magnetic Systems, Chapter 6: Communication, Signal and Image Processing, Data Acquisition, Identification and Recognition Technologies, Chapter 7: Materials Science and Applications, Chapter 8: Advanced Information and Innovative Technologies for Management, Logistics, Economics, Marketing, Assessment.

Micro/Nano-Chip Electrokinetics

This text focuses on the physics of fluid transport in micro- and nanofabricated liquid-phase systems, with consideration of gas bubbles, solid particles, and macromolecules. This text was designed with the goal of bringing together several areas that are often taught separately - namely, fluid mechanics, electrodynamics, and interfacial chemistry and electrochemistry - with a focused goal of preparing the modern microfluidics researcher to analyse and model continuum fluid mechanical systems encountered when working with micro- and nanofabricated devices. This text serves as a useful reference for practising researchers but is designed primarily for classroom instruction. Worked sample problems are included throughout to assist the student, and exercises at the end of each chapter help facilitate class learning.

The Physics of Microdroplets

Issues in Nanotechnology and Micotechnology: Materials and Molecular Research: 2011 Edition

Electrokinetics is currently the mechanism of choice for fluid actuation and bioparticle manipulation at microscale and nanoscale dimensions. There has

recently been widespread interest in the use of AC electric fields, given the many advantages it offers over DC electrokinetics. Nevertheless, a fundamental understanding of the governing mechanisms underlying the complex and nonlinear physicochemical hydrodynamics associated with these systems is required before practical microfluidic and nanofluidic devices can be engineered. This text aims to provide a comprehensive treatise on both classical equilibrium electrokinetic phenomena as well as the more recent non-equilibrium phenomena associated with both DC and AC electrokinetics in the context of their application to the design of microfluidic and nanofluidic technology. In particular, Leslie Yeo and Hsueh-Chia Chang discuss the linear and nonlinear theories underlying electroosmosis, electrophoresis, and dielectrophoresis pertaining to electrolytes as well as dielectric systems. Interfacial electrokinetic phenomena such as electrospraying, electrospinning, and electrowetting are also discussed.

Canadian Journal of Chemistry

To provide an interdisciplinary readership with the necessary toolkit to work with micro- and nanofluidics, this book provides basic theory, fundamentals of microfabrication, advanced fabrication methods, device characterization methods and detailed examples of applications of nanofluidics devices and systems. Case studies describing fabrication of complex micro- and nanoscale systems help the reader gain a practical understanding of developing and fabricating such systems. The resulting work covers the fundamentals, processes and applied challenges of functional engineered nanofluidic systems for a variety of different applications, including discussions of lab-on-chip, bio-related applications and emerging technologies for energy and environmental engineering. The fundamentals of micro- and nanofluidic systems and micro- and nanofabrication techniques provide readers from a variety of academic backgrounds with the understanding required to develop new systems and applications. Case studies introduce and illustrate state-of-the-art applications across areas, including lab-on-chip, energy and bio-based applications. Prakash and Yeom provide readers with an essential toolkit to take micro- and nanofluidic applications out of the research lab and into commercial and laboratory applications.

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