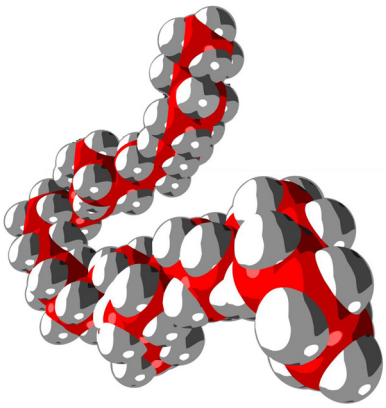

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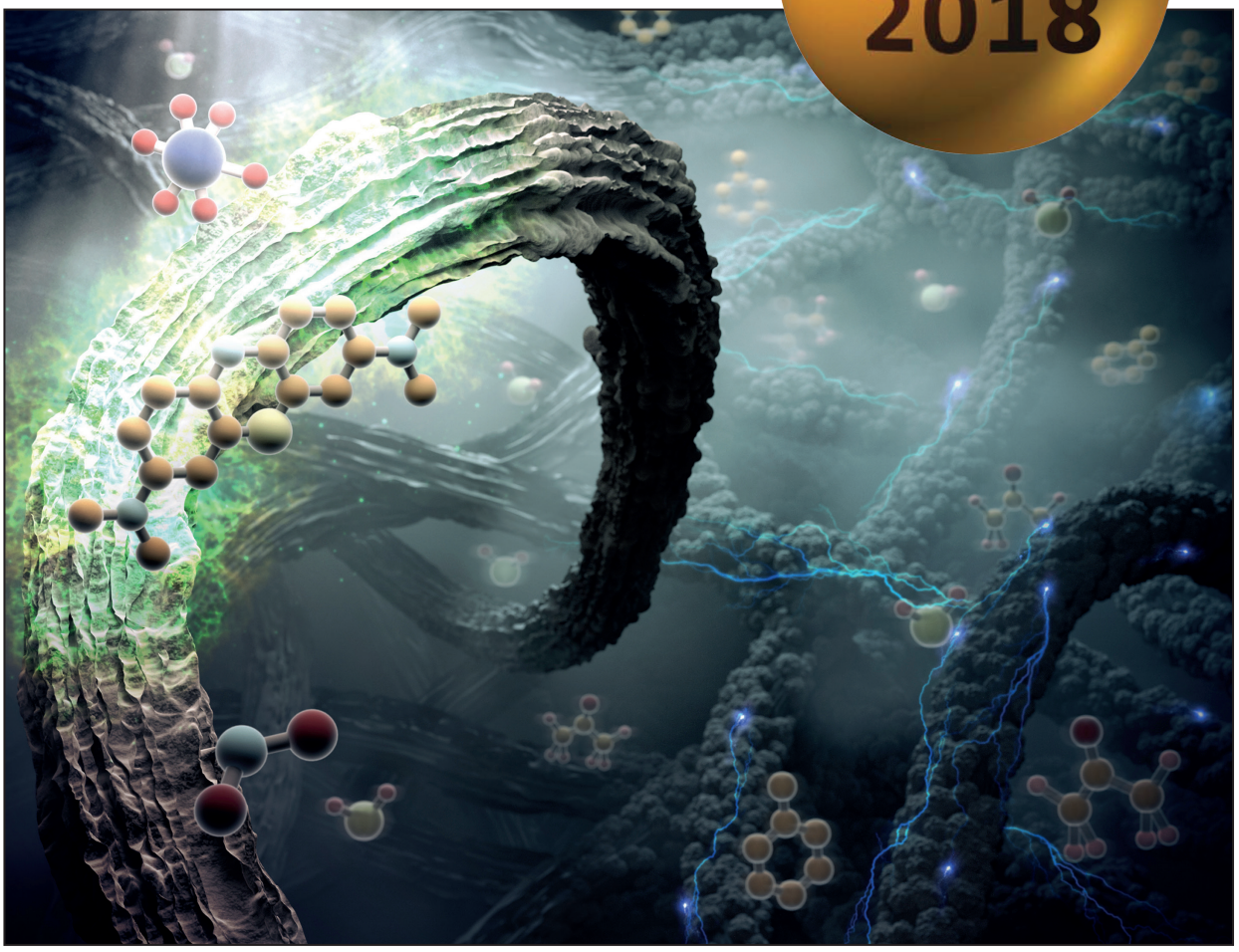

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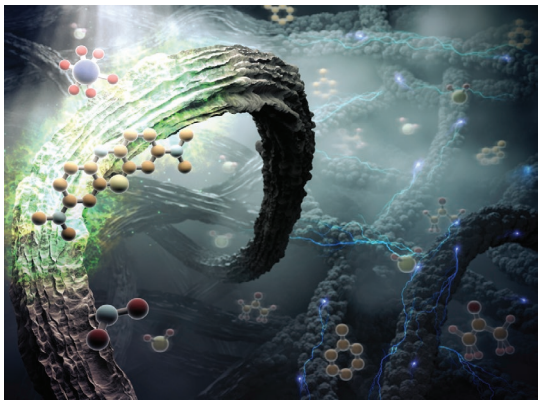
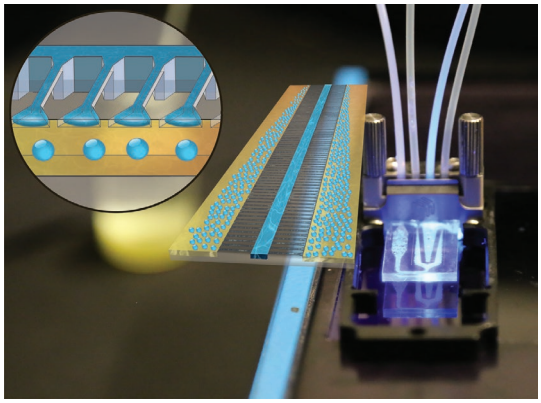
Front Cover: The cover highlights one-dimensional (1D) fibrous nanostructures synthesized using an electrospinning technique for chemical sensing applications. In the review article by Seon-Jin Choi, Luana Persano, Andrea Camposeo, Ji-Soo Jang, Won-Tae Koo, Sang-Joon Kim, Hee-Jin Cho, Il-Doo Kim, and Dario Pisignano two different types of sensing principles are described wherein electrical signal transductions and optical color changes are induced by exposure to chemical agents. The 1D nanofiber-based sensors offer great potential for practical use in environmental hazardous chemical detection and healthcare monitoring. This research is reported in *Macromolecular Materials and Engineering* (DOI: 10.1002/mame.201600569).



Back Cover: Enabling the production of almost any material at high throughput is essential to bring microfluidics towards industrial applications. The back cover image shows a parallelized step emulsification device in glass to produce monodisperse microdroplets at large scale. (Graphic artist: Alessandro Ofner). This research is reported by Alessandro Ofner, David G. Moore, Patrick A. Rühs, Pascal Schwendimann, Maximilian Eggersdorfer, Esther Amstad, David A. Weitz, and André R. Studart in *Macromolecular Chemistry and Physics* (DOI: 10.1002/macp.201600472).



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We would like to thank all contributors to this wonderful collection and hope you will enjoy reading these articles as much as we did.

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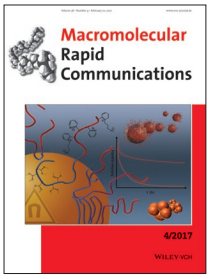

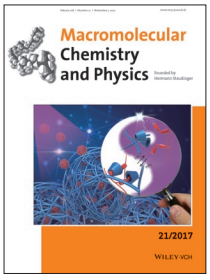

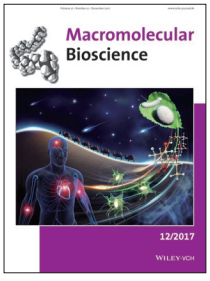

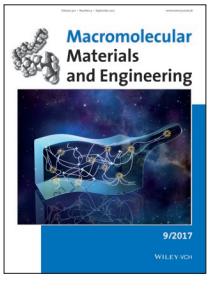

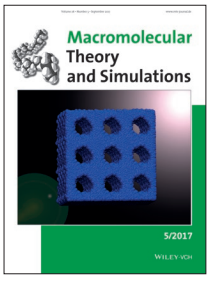

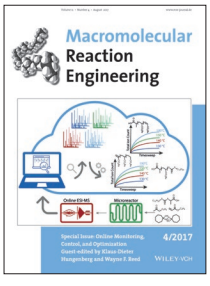

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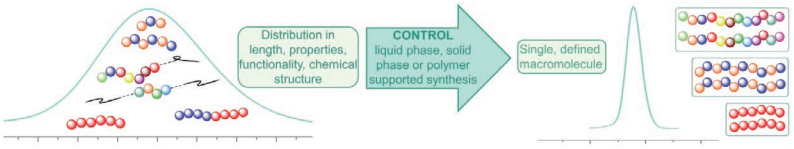
Macromolecular Rapid Communications

Recent Progress in the Design of Monodisperse, Sequence-Defined Macromolecules

S. C. Solleder, R. V. Schneider, K. S. Wetzel, A. C. Boukis, M. A. R. Meier*

Macromol. Rapid Commun. **2017**, *38*, 1600711
DOI:10.1002/marc.201600711

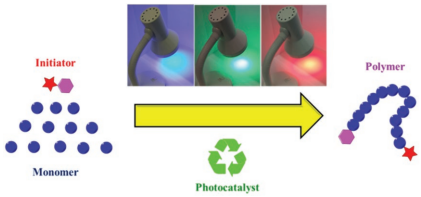
A review of synthesis procedures leading to monodisperse and sequence-defined linear macromolecules, including conjugated and non-conjugated oligomers, is presented. The approaches are summarized and analyzed in terms of applicability in polymer science. Simple synthesis procedures, scales, overall yields, achievable level of control, and the purity of the obtained macromolecules are important benchmarks.



Photocontrolled Living Polymerization Systems with Reversible Deactivations through Electron and Energy Transfer

S. Shanmugam,* J. Xu, C. Boyer*

Macromol. Rapid Commun. **2017**, *38*, 1700143
DOI:10.1002/marc.201700143

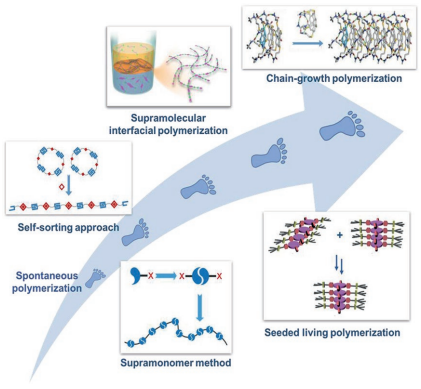


Visible-light-mediated polymerization has been shaping the progress and direction of the polymer community due to its facile setup and its robust spatial, temporal, and sequence control. The current innovations in visible-light-mediated polymerization are highlighted and an overview of the future directions of the field is given.

Supramolecular Polymerization from Controllable Fabrication to Living Polymerization

Z. Huang, B. Qin, L. Chen, J.-F. Xu, C. F. J. Faul, X. Zhang*

Macromol. Rapid Commun. **2017**, *38*, 1700312
DOI:10.1002/marc.201700312

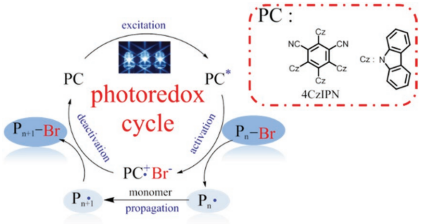


Methods of supramolecular polymerization from controllable fabrication to living polymerization have been recently developed. The self-sorting approach, supramonomer method, and supramolecular interfacial polymerization extend methods of supramolecular polymerization for controllable fabrication under thermodynamic control. Furthermore, seeded polymerization under pathway complexity and chain-growth polymerization advance the living supramolecular polymerization upon kinetic control. These developments are summarized in this article.

Metal-Free Atom Transfer Radical Polymerization of Methyl Methacrylate with ppm Level of Organic Photocatalyst

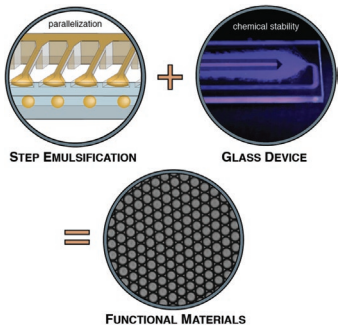
Z. C. Huang, Y. Gu, X. D. Liu, L. F. Zhang,* Z. P. Cheng,* X. L. Zhu

Macromol. Rapid Commun. **2017**, *38*, 1600461
DOI:10.1002/marc.201600461



A novel photocatalyst 1,2,3,5-tetrakis-(carbazol-9-yl)-4,6-dicyanobenzene is successfully used to mediate a metal-free atom transfer radical polymerization of methyl methacrylate just with ppm level usage under irradiation of a blue light emitting diode at room temperature.

High-throughput production of monodisperse emulsions is attractive in material-, food-, and pharmaceutical sciences, since it provides precise control to create functional microcapsules and microparticles. This study combines the scalability of step emulsification with the chemical inertness of glass devices to enable the robust and high-volume production of a broad variety of functional materials.

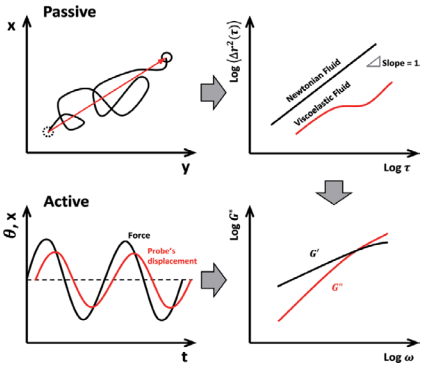


High-Throughput Step Emulsification for the Production of Functional Materials Using a Glass Microfluidic Device

A. Ofner, D. G. Moore, P. A. Rühs,*
P. Schwendimann, M. Eggersdorfer,
E. Amstad, D. A. Weitz, A. R. Studart*

Macromol. Chem. Phys. **2017**, *218*, 1600472
DOI:10.1002/macp.201600472

Microrheological techniques have been widely used to investigate dynamics and structures of soft matters in polymer characterization and biological studies at the micro- or nanoscale. The basic principles, typical setups, and recently developed microrheometers are detailed in this review.

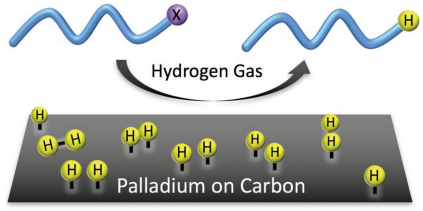


Rheological Study of Soft Matters: A Review of Microrheology and Microrheometers

W. Liu,* C. Wu

Macromol. Chem. Phys. **2017**, *218*, 1700307
DOI:10.1002/macp.201700307

A mild, robust, and clean reduction of atom transfer radical polymerization chain-ends. Using a combination of catalytic palladium-on-carbon and hydrogen gas, a straightforward method for the hydrogenolysis of halide-terminated polymers is reported. This method is effective on several monomer classes (acrylate, stryrene, methacrylate) and performs excellently in numerous solvents.

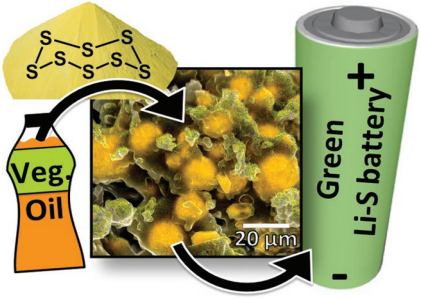


Practical Chain-End Reduction of Polymers Obtained with ATRP

W. R. Gutekunst, A. Anastasaki, D. J. Lunn,
N. P. Truong, R. Whitfield, G. R. Jones,
N. J. Treat, A. Abdilla, B. E. Barton,
P. G. Clark, D. M. Haddleton, T. P. Davis,
C. J. Hawker*

Macromol. Chem. Phys. **2017**, *218*, 1700107
DOI:10.1002/macp.201700107

High-sulfur content composite materials consisting of sulfur microparticles inside a copolymeric network can be prepared from cost-effective waste-product elemental sulfur and sustainable, nonhazardous vegetable oils in a simple one-pot procedure and utilized as active material in lithium-sulfur batteries yielding good capacity retention.



Sulfur-Based Polymer Composites from Vegetable Oils and Elemental Sulfur: A Sustainable Active Material for Li–S Batteries

A. Hoefling, Y. J. Lee, P. Theato*

Macromol. Chem. Phys. **2017**, *218*, 1600303
DOI:10.1002/macp.201600303

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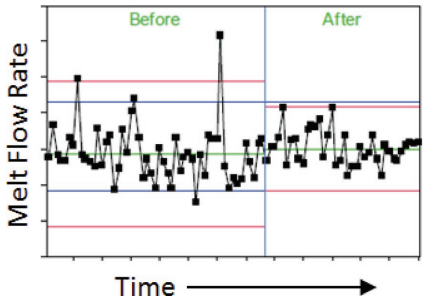
Macromolecular Reaction Engineering

Use of Online Spectroscopy to Control Polymerization in Industrial Processes

B. Colegrove,* K. Deshpande, R. Harner, L. Mikolajczyk, S. K. Stephenson, J. D. Tate, J. Weston

Macromol. React. Eng. 2017, *11*, 1600056
DOI:10.1002/mren.201600056



Online spectroscopy lends itself very well to monitoring polymerization reactors because the data it provides are information rich and can be deployed using fiber optics for remote sampling process streams. Several industrial examples are provided, including application to polyethylene, polycarbonate, polyurethane, and polystyrene processes.

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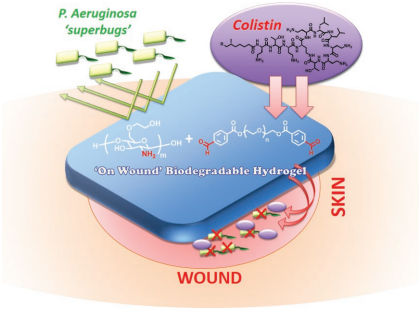
Macromolecular Bioscience

A Hydrogel-Based Localized Release of Colistin for Antimicrobial Treatment of Burn Wound Infection

C. Zhu, J. Zhao, K. Kempe, P. Wilson, J. Wang, T. Velkov,* J. Li, T. P. Davis, M. R. Whittaker, D. M. Haddleton*

Macromol. Biosci. **2017**, *17*, 1600320
DOI:10.1002/mabi.201600320

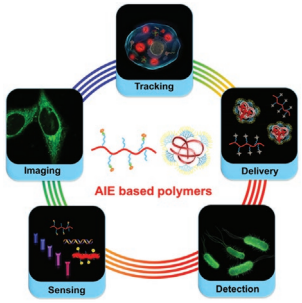


An "on-wound" biodegradable hydrogel loaded with antimicrobial colistin is developed to treat the "superbug" burn wound infections. This combination can achieve the localized delivery of colistin, reducing its systematic toxicity while providing a comfort wound-healing environment and preventing further infection. In vivo studies suggest colistin can be released effectively through this system and remain potent as the colistin solution.

AIE Polymers: Synthesis, Properties, and Biological Applications

R. Y. Zhan,* Y. T. Pan, P. N. Manghnani, B. Liu*

Macromol. Biosci. **2017**, *17*, 1600433
DOI:10.1002/mabi.201600433

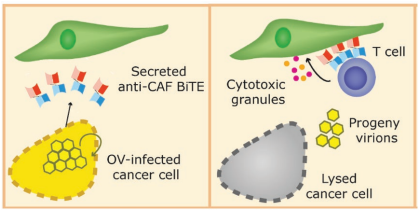


Aggregation induced emission (AIE) polymers are a series of polymers that display enhanced emission upon transforming from isolated molecular state to aggregated state. The recent progress of AIE polymers is summarized from the perspectives of their synthesis, properties, and biological applications.

Solid Tumor Immunotherapy with T Cell Engager-Armed Oncolytic Viruses

E. M. Scott, M. R. Duffy, J. D. Freedman, K. D. Fisher, L. W. Seymour*

Macromol. Biosci. **2017**, *17*, 1700187
DOI:10.1002/mabi.201700187



Oncolytic viruses are multimodal anticancer agents which can be engineered to express and secrete biologics locally within the tumor microenvironment. Here, arming oncolytic viruses with bispecific T cell engagers (BiTEs), capable of activating endogenous T cells to kill target cells, is explored. This strategy should improve the safety of BiTEs, while simultaneously affording the opportunity for synergy with viral oncolysis.

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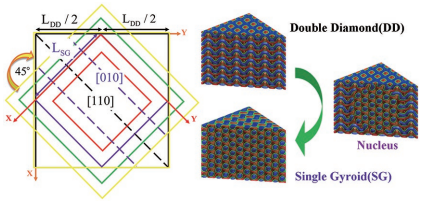
Macromolecular Theory and Simulations

The epitaxial relationship and nucleation kinetics regarding the single gyroid nanostructure in ABC triblock terpolymers are investigated using self-consistent field theory combined with the string method. The results demonstrate the significant potential of the order–order phase transition to fabricate functional materials with multiply continuous network nanostructure by regulating the kinetic pathways.



Formation of Single Gyroid Nanostructure by Order–Order Phase Transition Path in ABC Triblock Terpolymers

T. Sun, P. Tang,* F. Qiu,* Y. Yang, A.-C. Shi

Macromol. Theory Simul. **2017**, *26*, 1700023
DOI:10.1002/mats.201700023

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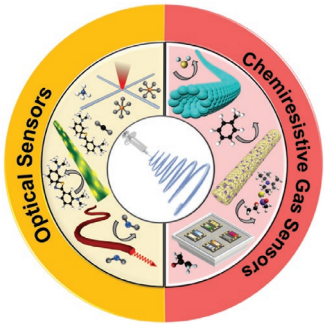
Macromolecular Materials and Engineering

This comprehensive review provides recent progresses of chemical sensors based on chemiresistive-type semiconductor metal oxides and optical-type nanomaterials exploiting absorption and emission properties. In particular, the authors focus on the diverse 1D nanofibrous structures synthesized by electrospinning technique for application in chemical sensor.

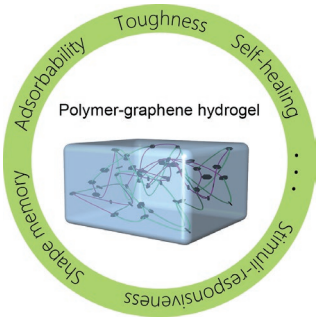


Electrospun Nanostructures for High Performance Chemiresistive and Optical Sensors

S.-J. Choi, L. Persano, A. Camposeo, J.-S. Jang, W.-T. Koo, S.-J. Kim, H.-J. Cho, I.-D. Kim,* D. Pisignano*

Macromol. Mater. Eng. **2017**, *302*, 1600569
DOI:10.1002/mame.201600569

Polymer–graphene hydrogels have attracted much attention and introduction of graphene could enable the composite hydrogel with excellent properties in various respects. In this brief review, graphene-containing polymer hydrogels with special properties are summarized including their preparations, properties, and applications. In addition, future perspectives of polymer hydrogels containing graphene are briefly discussed.

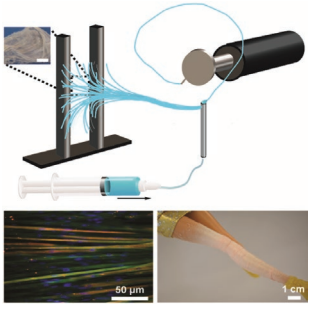


Recent Progress of Graphene-Containing Polymer Hydrogels: Preparations, Properties, and Applications

C. Pan, L. Liu,* G. Gai

Macromol. Mater. Eng. **2017**, *302*, 1700184
DOI:10.1002/mame.201700184

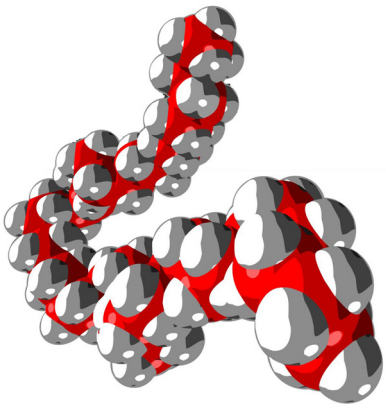
Pull spinning is a compact, portable nanofiber fabrication system that rapidly produces natural and synthetic fibers with minimal external processing parameters. Numerical, mechanical, and imaging analysis confirms pull spinning's ability to produce defect-free nanofibers with controllable orientation. The efficacy of point-of-use pull spun nanofibers is demonstrated for three case studies, ranging from tissue engineering to point-of-wear apparel.



Design and Fabrication of Fibrous Nanomaterials Using Pull Spinning

L. F. Deravi, N. R. Sinatra, C. O. Chantre, A. P. Nesmith, H. Yuan, S. K. Deravi, J. A. Goss, L. A. MacQueen, M. R. Badrossamy, G. M. Gonzalez, M. D. Phillips, K. K. Parker*

Macromol. Mater. Eng. **2017**, *302*, 1600404
DOI:10.1002/mame.201600404



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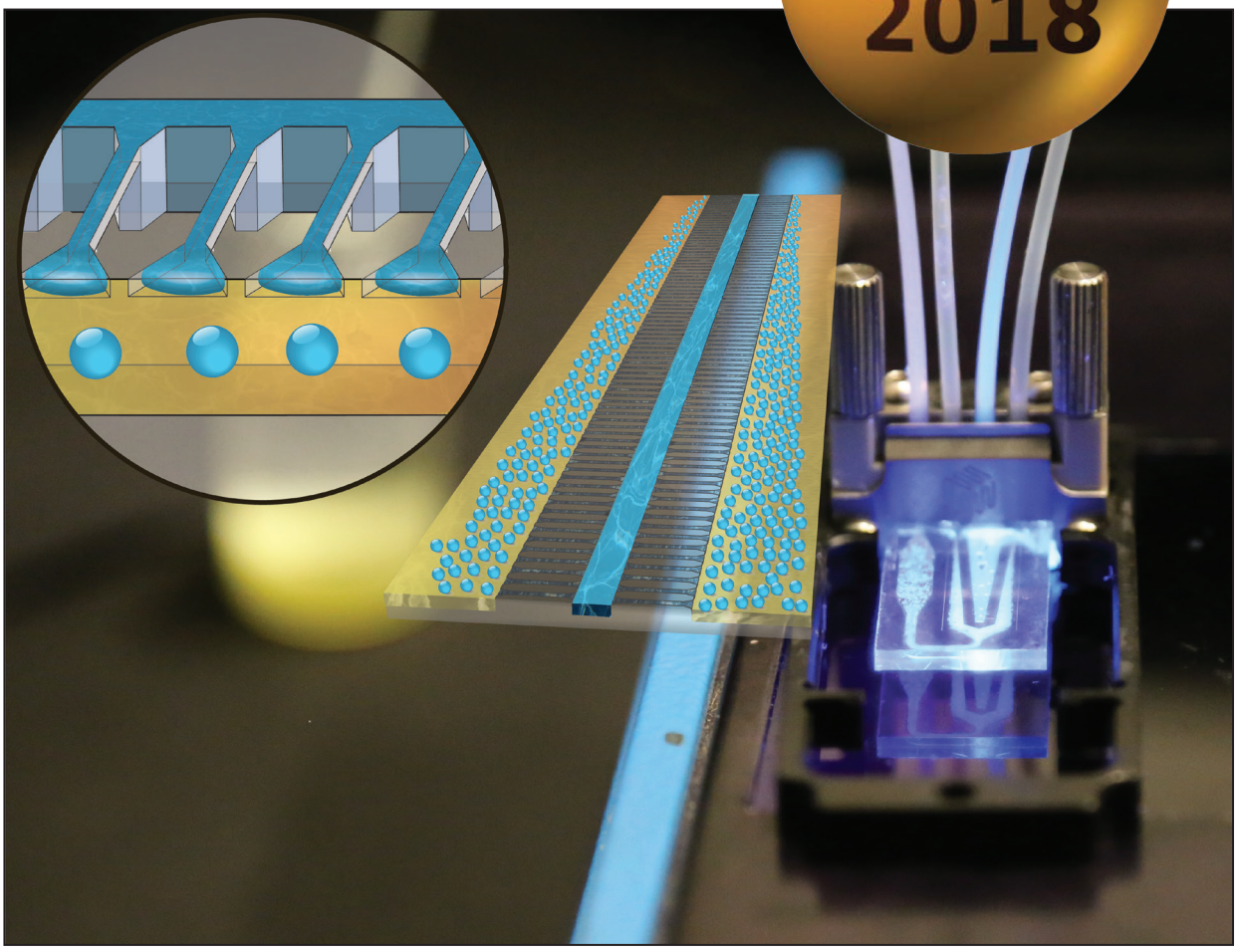

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