

TWENTY-SIXTH ANNUAL CONFERENCE ON MATERIAL SCIENCE
YUCOMAT 2025

Hunguest Hotel Sun Resort, Herceg Novi, Montenegro
September 1 to 5, 2025

Program
and
Book of Abstracts

Organised by
Materials Research Society of Serbia

Endorsed by
Federation of European Material Societies

CIP - Каталогизacija y пyблиkациji
HapoдHa библиотeka Србиje, Београд

66.017/.018(048)

621.762.5(048)

**DRUŠTVO za istraživanje materijala Srbije (Beograd), Godišnja konferencija
(26 ; 2025 ; Herceg Novi)**

Programme ; and The Book of Abstracts / Twenty-sixth Annual Conference YUCOMAT 2025,
Herceg Novi, Montenegro, September 1-5, 2025 ; organised by Materials Research Society of
Serbia ; [editor Dragan P. Uskoković]. - Belgrade : Materials Research Society of Serbia, 2025
(Herceg Novi : Biro Konto). - XXXVIII, 142 str. : ilustr. ; 24 cm

Tiraž 200. - Bibliografija uz pojedine apstrakte. - Registar.

ISBN 978-86-919111-8-8 (broš.)

a) Hayka o материјалима -- Апстракти b) Технички материјали -- Апстракти v) Наноматеријали
-- Апстракти

COBISS.SR-ID 173754377

26th ANNUAL CONFERENCE ON MATERIAL SCIENCE YUCOMAT 2025

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Publisher: Materials Research Society of Serbia
Knez Mihailova 35/IV, P. O. Box 433, 11000 Belgrade, Serbia
Phone: +381 11 2185-437; <http://www.mrs-serbia.org.rs>

Editor: Prof. Dr. Dragan P. Uskoković

Conference

Secretary: Jasmina Jevtić and Miljana Jovanović

Technical

editors: Dr. Ivana Dinić

Typesetting

and prepress: Dr. Aleksandar Dekanski

Covers: Front cover photo: property of MRS Serbia

Back cover photo: Marcin Konsek / Wikimedia Commons - CC BY-SA 4.0

ISBN 978-86-919111-8-8

<https://doi.org/10.5281/zenodo.16887515>

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MRSS is member of the Federation of European Materials Societies



Printed in: **Biro Konto**, Sutorina bb, Igalo - Herceg Novi, Montenegro
Phones: +382-31-670123, 670025, E-mail: bkonto@t-com.me

Circulation: 200 copies. The end of printing: August 2025

P.S.17.

Microscale Tattooing of Hydrogels and Cells: Benzoxaborole-Driven Microcontact Printing of Glycosylated Surfaces

Mariusz Uchman¹, Nazim Pallab^{2,3}, Eric Sperlich², Matthias Schenderlein³,

Anne Krüger-Genge³, Jinyuan Li⁴, Lukas Zeininger⁴, Zdenek Tošner¹, Martin Reifarth^{2,3}

¹Department of Physical and Macromolecular Chemistry, Faculty of Science, Charles University,
Hlavova 8, 128 43, Prague 2, Czech Republic

²Institute of Chemistry, University of Potsdam, 14476, Potsdam

³Fraunhofer Institute of Applied Polymer research, 14476 Potsdam

⁴Responsive Soft Materials and Interfaces Lab, Department of Colloid Chemistry, Max Planck Institute
of Colloids and Interfaces, Am Muehlenberg 1, 14476 Potsdam, Germany

Microcontact printing (μ CP) is a widely used technique for microscale surface patterning. In this study, we present a polymer-supported μ CP method for the patterning of (bioactive) glycosylated surfaces. This method was applied to three distinct surfaces: (1) monosaccharide-modified hydrogel surfaces prepared via a "grafting from" approach; (2) glycosylated surfaces of polymeric microspheres; and (3) the membranes of human primary gastric cells. Specifically, we pattern aldose- (glucose, fucose, galactose) or ketose- (fructose, sorbose) functionalized surfaces. Patterning was achieved by direct contact with a patterned polydimethylsiloxane (PDMS) stamp, whose surface was grafted with a dopamine-containing polymer. The polymer brushes offer an anchor for the boronic acid derivative 6-aminobenzo[c][1,2]oxaborol-1(3H)-ol (ABOB), used as an ink for surface functionalization. During μ CP, ABOB patterns transferred to the target surface through the formation of carbohydrate-ABOB complexes at neutral pH conditions. Fluorescence microscopy confirmed the successful transfer of ABOB patterns to glycosylated surfaces, with clear "tattoo-like" signatures observed on hydrogel and cell surfaces.

Acknowledgment: M.U. acknowledges the Czech Science Foundation (GACR) for its financial support under project number 25-15590S.