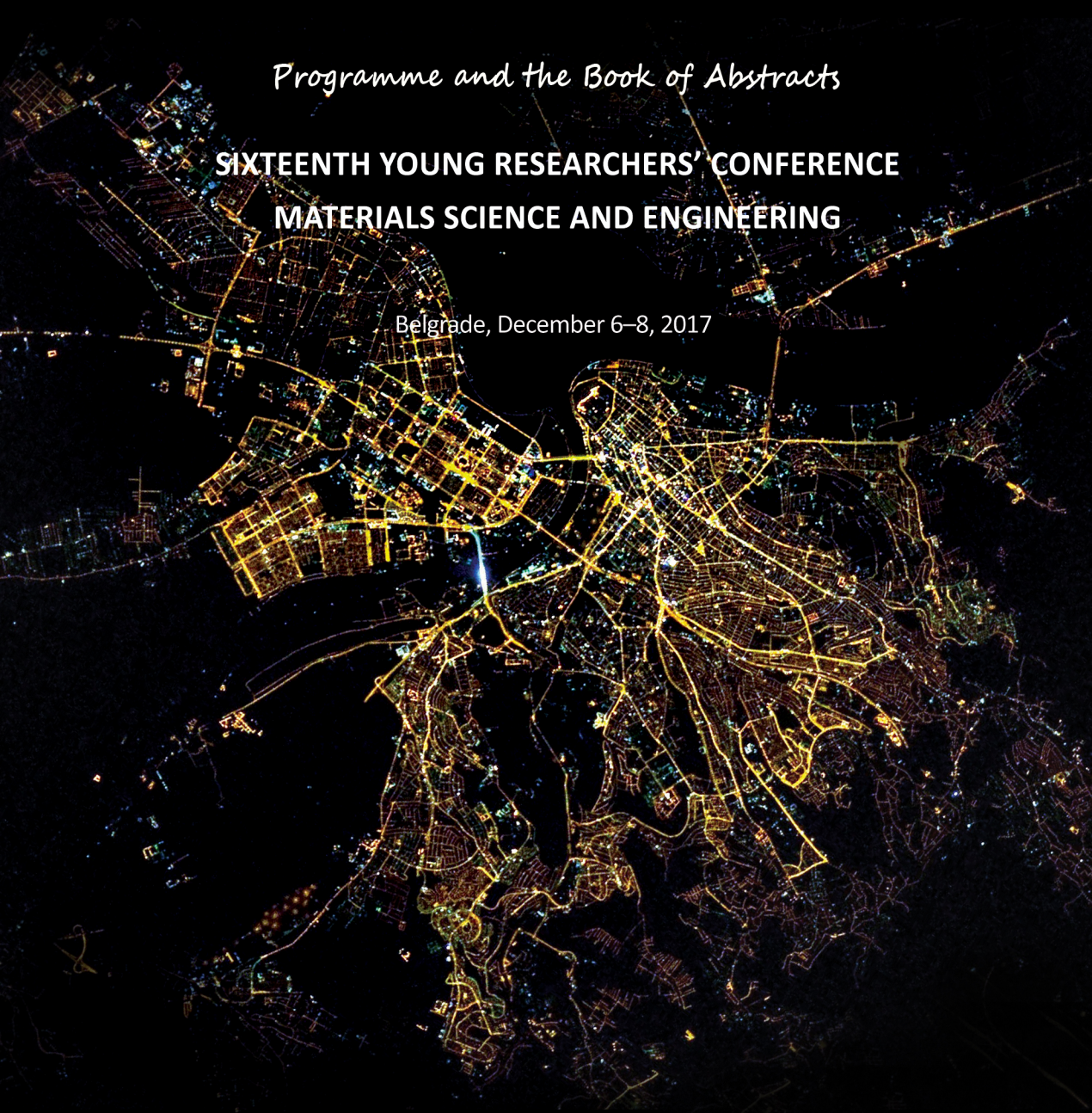


MATERIALS RESEARCH SOCIETY OF SERBIA
INSTITUTE OF TECHNICAL SCIENCES OF SASA

Programme and the Book of Abstracts

**SIXTEENTH YOUNG RESEARCHERS' CONFERENCE
MATERIALS SCIENCE AND ENGINEERING**

Belgrade, December 6–8, 2017



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MATERIALS SCIENCE AND ENGINEERING**

December 6-8, 2017, Belgrade, Serbia

Program and the Book of Abstracts

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Aim of the Conference

Main aim of the conference is to enable young researchers (post-graduate, master or doctoral student, or a PhD holder younger than 35) working in the field of materials science and engineering, to meet their colleagues and exchange experiences about their research.

Topics

Biomaterials
Environmental science
Materials for high-technology applications
Nanostructured materials
New synthesis and processing methods
Theoretical modelling of materials

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Results of the Conference

Beside printed «Program and the Book of Abstracts», which is disseminated to all conference participants, selected and awarded peer-reviewed papers will be published in journals “Tehnika – Novi Materijali” and “Processing and Application of Ceramics“. The best presented papers, suggested by Session Chairpersons and selected by Awards Committee, will be proclaimed at the Closing Ceremony. Part of the award is free-of-charge conference fee at YUCOMAT 2018.

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1-4

Electrophoretic deposition of biocomposite ceramic coatings of hydroxyapatite and chitosan with silver and gentamicin on titanium for medical applications

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Biocomposite ceramic coatings hydroxyapatite (HAP), silver/hydroxyapatite (Ag/HAP) and silver/hydroxyapatite/graphene (Ag/HAP/Gr) are obtained on titanium by electrophoretic deposition (EPD). The goal of this research was to develop multifunctional composite coatings as a suitable strategy to improve the surface properties of metallic implants. The deposition was performed on titanium electrodes with specific geometry suitable for implantation in the frontal bone of rabbits for in vivo experiments. The effect of deposition parameters on deposited mass was investigated by varying different values of constant voltage for various deposition time. Uniform and compact HAP coatings were successfully deposited at applied voltage of 30 V for 45 s, whereas Ag/HAP and Ag/HAP/Gr coatings with satisfying adhesion and coverage were deposited at applied voltage of 60 V for 1 min. Bearing in mind certain toxic effects of the nanoparticle silver, the deposition of the coating of hydroxyapatite/chitosan/graphene (HAP/CS/Gr) of the same composition with the addition of the antibiotic gentamicin was performed, in order to replace the silver nanoparticles. The antimicrobial activity of the coating HAP/CS/Gr without and with gentamicin against *Staphylococcus aureus* and *Escherichia coli* was examined by agar diffusion test. Moreover, disc diffusion test showed improved bactericidal effect of gentamicin-loaded composite coatings against *Staphylococcus aureus* and *Escherichia coli* compared to control non-gentamicin-loaded coatings.

Sixteenth Young Researchers Conference – Materials Science and Engineering
December 6-8, 2017, Belgrade, Serbia

Abramović Biljana	maria.uzelac@dh.uns.ac.rs	23
Abramović Denis		39
Adamović Tijana	smilovanovic@tmf.bg.ac.rs	13
Adler-Abramovich Lihi		54
Aleksić Stanko O.	frakulah@gmail.com	43
Andrearczyk Tomasz		51
Anđelković Ljubica	ljubica@chem.bg.ac.rs	1
Anđić Zoran		64
Antanasijević Davor		20
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Arnon Zohar A.	zoharnon@gmail.com	54
Babenko Olha	olha.shevo@gmail.com	55
Backović Gordana	gbackovic01@gmail.com	36
Bajac Branimir		41
Bajuk Bogdanović Danica		36, 38, 48, 53
Banić Nemanja		23
Barinov Sergey M.		15, 16
Batalović Katarina		28
Baum Andreas		44
Bečelić-Tomin Milena		21
Bibić Nataša		47
Bikić Vesna		31
Biliškov Nikola		50
Blagojević Mina	mina.blagojevic7@gmail.com	8
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Bobreshov Denis A.	bobreshovdenis@yandex.ru	56
Boldyrev Kirill	kn.boldyrev@gmail.com	45
Bošković Marko		28
Bryk Paweł		32
Caflisch Amedeo		54
Cherepanov Vladimir A.		41
Chodkowski Michał	michal@chodkowski.eu	32, 49
Chovelon Jean-Marc		18

Sixteenth Young Researchers Conference – Materials Science and Engineering
December 6-8, 2017, Belgrade, Serbia

Cygan Rafał		40
Čirić-Marjanović Gordana		46
Dabić Zagorac Dragana Č.		22
Dalmacija Božo		21
Damjanović-Vasilic Ljiljana		31
Davidović Slađana Z.	sdavidovic@tmf.bg.ac.rs	17
Deak Marko		16
Demboski Goran		63
Demoli Nazif		39
Diklić Nataša P.	natasadkl@gmail.com	28
Dimitrijević-Branković Suzana I.		17
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Dobrota Ana S.	ana.dobrota@ffh.bg.ac.rs	27, 28
Domagala Jaroslaw		51
Don Lopez David		5
Dong Chuang		33
Dong Honggang		33
Dubourg Georges		41
Đokić Jovana		63
Đokić Stefan	stefandj.tmf@gmail.com	58
Đošić Marija		4, 14
Đukić-Vuković Aleksandra		2
Egerić Marija	egeric_marija@yahoo.com	20
Erić Suzana		31
Ferronato Corinne		18
Figielski Tadeusz		51
Fine Ludovic		18
Fomina Alla		16

Sixteenth Young Researchers Conference – Materials Science and Engineering
December 6-8, 2017, Belgrade, Serbia

Gajić Nataša	ngajic@tmf.bg.ac.rs	24, 64
Gajić Radoš		27
Gavrilova Lyudmila Y.		40
Gazit Ehud		54
Gélin Patrick		18
Glišić Sandra B.		60
Gojković Snežana		58
Goldberg Margarita A.	naiv.syper@gmail.com	15, 16
Golovachev Ivan B.		34
Gozdecka Agata	agata.gozdecka@poczta.umcs.lublin.pl	11
Grbović Novaković Jasmina		50
Grudzień Małgorzata		40
Grujić Dušan		39
Guitián Rivera Francisco		5
Hajnrih Teodora		63
Holclajtner-Antunović Ivanka		48
Ilić Iva	ivailic36@gmail.com	4
Inanloo Maranloo Zahra		44
Ivanovska Aleksandra	adicka_654@yahoo.com	63
Jakiela Rafał		51
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Jančić Ivan		8
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Janković Ana		4, 7, 14
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Jovanović Zoran		28, 48
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Jurak Małgorzata		11
Kackl Rudi		44
Kalagasidis Krušić Melina		26

Sixteenth Young Researchers Conference – Materials Science and Engineering
December 6-8, 2017, Belgrade, Serbia

Kalinovskiy V. V.		66
Kamberović Željko	angelmitrovic@gmail.com	24, 64
Karadžić Katarina	kkatrinari@yahoo.com	33
Kataranovski Milena		9
Kerkez Đurđa		21
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Klym Halyna	klymha@yahoo.com	52
Knežević Marina		63
Knowles Tuomas P. J.		54
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Kostić Mirjana		63
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Krčmar Dejan		21
Kuhn Alexander		59
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Kurko Sandra		50
Kuznetsov Maxim V.		56, 65
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Laušević Zoran		35
Lazarević Nenad		42, 44
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Levenets Anastasiia V.	avlevenets@gmail.com	66
Levin Aviad		54
Li Haidong		59
Limtrakul Jumras		59
Lipovskaya Y. S.		66
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Lukić Miodrag J.		50
Luković Miloljub D.		43
Lusakowska Elzbieta		51
Ma Yongchang		42

Sixteenth Young Researchers Conference – Materials Science and Engineering
December 6-8, 2017, Belgrade, Serbia

Makarova Anna E.	annymakarova23@gmail.com	41
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Mihajlovski Katarina R.		17
Mikuškiewicz Marta		57
Milanović Igor		28, 50
Milanović Jovana		63
Milanović Vitomir		29
Milenković Marina		8
Milivojević Milan		19
Milosavljević Ana	anam@ipb.ac.rs	42, 44
Milošević Olivera	olivera.milosevic@itn.sanu.ac.rs	2
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Milutinović Milica D.		17
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Mitrić Miodrag	mmitric@vin.bg.ac.rs	37
Mitrović Angelina		24
Mitrović Nebojša S.		43
Mitschek Merlin		44
Modrić-Šahbazović Almedina	almedina.modric-sahbazovic@untz.ba	47
Moskal Grzegorz		57
Mravik Željko	zeljkomravik@gmail.com	48

Mychinko Mikhail Yu.	mikhail.mychinko@urfu.ru	34
Natić Maja M.		22
Nedić Zoran P.		61
Nesterović Andrea	nesterovic.andrea@gmail.com	41
Nešović Katarina	knesovic@tmf.bg.ac.rs	7
Nikolić Aleksandar S.		1
Nikolić Božidar		44
Nikolić Marija	m.nikolic0211@gmail.com	23
Nikolić Marko		2
Nikolić Vladimir		35
Nikolić Zoran		43
Nikolovski Ivana		24
Ninkov Marina		9
Novaković Mirjana		47
Obradović Bojana	bojana@tmf.bg.ac.rs	8, 10, 13, 16
Obradović Maja		58
Okovit V. S.		66
Opačak Nikola	opacaknn@gmail.com	29
Opačić Marko	marko.opacic@ipb.ac.rs	42
Opel Matthias		44
Orlović Aleksandar M.		60
Osmokrović Andrea		10
Pagnacco Maja C.		25, 61
Panić Vesna		3
Pantelić Dejan		39
Pantelić Milica M.		22
Pantić Tijana	tijanap@vinca.rs	50
Pašti Igor A.	igor@ffh.bg.ac.rs	27, 28
Pavlović Milan	skyway2707@gmail.com	8
Peddis Davide		53
Pejović Predrag		35
Peréz-Huertas Salvador		49

Sixteenth Young Researchers Conference – Materials Science and Engineering
December 6-8, 2017, Belgrade, Serbia

Perić-Grujić Aleksandra		7
Pešić Jelena		27
Petrović Čedomir		42, 44
Petrović Jelena	jelenapetrovic.co@gmail.com	10
Petrović Predrag		8
Phuakkong Oranit		59
Popova Marina		45
Popović Ivanka		3
Popović Zoran V.		42, 44
Postole Georgeta		18
Prokić Vidojević Dragana	drprokic@yahoo.co.uk	60
Protsenko Pavel		16
Radaković Jana		28
Radelytskyi Igor		51
Radetić Maja		50
Radoičić Marija		50
Radonjić Miloš M.		42, 44
Radosavljević Evans Ivana		31
Radotić Ksenija		10
Radovanović Filip		9
Radovanović Jelena		29
Radovanović Željko		50
Rakoczy Łukasz	lrakoczy@agh.edu.pl	40
Rakočević Zlatko		47
Ranđelović Marjan		23
Ranitović Milisav		24
Ranogajec Jonjaua		24
Ravaine Valerie		59
Red'ko Roman		55
Red'ko Svitlana		55
Rmuš Jelena	sonja.jovanovic@vinca.rs	53
Sadowski Janusz		51
Safonov Alexey V.	safa2004@mail.ru	65

Salom Iva		39
Savić Milijana	msavic@vinca.rs, savic.r.milijana@gmail.com	28
Semenenko Mykola		55
Senčanski Jelena	jelenasencanski@gmail.com	38
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Slijepčević Nataša	natasa.slijepcevic@dh.uns.ac.rs	21
Smailagić Anita T.	anitasmailagic@yahoo.com	22
Smičiklas Ivana		20
Smirnov Sergey V.		15, 16
Smirnov Valeriy V.		15, 16
Sojić Nešo		59
Spasenović Marko		39
Spasojević Dragica		10
Spasojević Pavle		3
Srdić Vladimir		41
Stanimirović Zdravko I.		43
Stanojević Nataša	natastan@yahoo.com	13
Stanojković Lazar		26
Stevanović Kristina Z.	kristina@ffh.bg.ac.rs	25
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Stojanović Srna	srnastojanovic@yahoo.com	31
Stojilović Nenad		44
Stojković-Simatović Ivana		36, 38
Stojkovska Jasmina		8, 13
Sun Xiaofeng		33
Suvorov Danilo	danilo.suvorov@ijs.si	53
Szaniawska Magdalena	magdalena.szaniawska@wp.pl	60, 62
Szperlich Piotr		57
Szymczyk Katarzyna		60, 62
Šaponjić Zoran		50
Šarić Kristina		31
Šćepanović Maja		44
Škorić Branko		41

Sixteenth Young Researchers Conference – Materials Science and Engineering
December 6-8, 2017, Belgrade, Serbia

Šolajić Andrijana	solajic@ipb.ac.rs	27
Šuljagić Marija		1
Tanasić Jelena		24
Tanasković Darko		42
Taraba Anna	annataraba@gmail.com	60, 62
Tchernychova Elena		38
Tegegn Asmamew		6
Terpiłowski Konrad	terpil@umcs.pl	32, 49
Tihonovskiy M. A.		66
Todorović Dejan		39
Toimil-Molares Maria Eugenia		35
Tomašević Pilipović Dragana		21
Tran Vu Tung Lam	vu-tung.tran@ircelyon.univ-lyon1.fr	18
Trivunac Katarina		19
Trzyna Malgorzata		51
Ugrinović Vukašin	vukasin.ugrinovic@yandex.ru	3
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Varga Nataša		21
Vasilenko R. L.		66
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Vidović Milka		59
Vitalis Andreas		54
Volkova Nadezhda E.		34, 40, 41
Vučetić Snežana		24
Vujković Milica	jelena_aleksic2000@yahoo.com	36, 37, 38
Vujković Milorad M.	milorad.vujkovic@gmail.com	30
Vukašinović-Sekulić Maja		4, 7, 14
Vukmirović Jelena		41
Wang Qing		33

Sixteenth Young Researchers Conference – Materials Science and Engineering
December 6-8, 2017, Belgrade, Serbia

Wang Aifeng		44
Warakulwit Chompunuch		59
Wiącek Agnieszka Ewa		11
Wosinski Tadeusz		51
Wrobel Jerzy		51
Yilma Yenealem	yenealemy@gmail.com	6
Zarubica Aleksandra		12
Zdujć Aleksandar	zdujic2@gmail.com	19
Zhang Hongyu		33
Zhang Yu	zhangyujustin@126.com	33
Zielińska-Lipiec Anna		40
Zigah Dodzi		59
Zvicer Jovana		16
Zyaikin Evgeniy I.		34
Žižović Irena		13, 50