

Curriculum vitae

Name: Jiri Chvojka

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Education and academic degrees

Doctor, Ph.D., Textile Technology

Technical University of Liberec, Faculty of Textile, Czech Republic. 2013.

Engineer, Ing., Textile Technology

Technical University of Liberec, Faculty of Textile, Czech Republic 2007.

Professional profile

Head of department 2018 - present

Assistant professor

Employee research and development with a scientific degree. Technical University of Liberec, Faculty of Textile, Czech Republic, 2013 - present.

Specialization: Research and development of nanofiber materials for tissue engineering, medical materials, filter materials and raw nonwovens materials for technical applications in general.

Young Researcher / Junior Researcher

Technical University of Liberec, Department of nanomaterials for Advanced Technology and Innovation, 2011-present.

Employee research and development

Technical University of Liberec, Faculty of Textile, Czech Republic. 2002-2007.

Specialization electrospinning of polymer solutions, research and development of nanofiber materials, research of the effect of solvents on the electrostatic spinning.

Teaching experience and supervised doctoral thesis

Medical textile (master study program Faculty of Textile and Faculty of Mechatronics)

Thermal and chemical technologies (master study program Faculty of Textile)

Recently supervised doctoral thesis

Jakub Erben: The Meltblown technology for biodegradable polymers, creating 3D structures for tissue engineering.

Radek Jirkovec: Study of wetting of fibrous structures using biocompatible hydrogels.

Selected publications including Impact Factors

2018

Hakova, Martina; Raabova, Hedvika; Havlikova, Lucie; Chvojka, Jiri et al., Testing of nylon 6 nanofibers with different surface densities as sorbents for solid phase extraction and their selectivity comparison with commercial sorbent, *TALANTA* Volume: 181 Pages: 326-332 Published: MAY 1 2018

Rampichova, M.; Chvojka, J.; Jencova, V.; et al. The combination of nanofibrous and microfibrous materials for enhancement of cell infiltration and in vivo bone tissue formation, *BIOMEDICAL MATERIALS* Volume: 13 Issue: 2 Article Number: 025004 Published: MAR 2018

Hakova, Martina; Havlikova, Lucie Chocholousova; Chvojka, Jiri; et al. An on-line coupling of nanofibrous extraction with column-switching high performance liquid chromatography - A case study on the determination of bisphenol A in environmental water samples, *TALANTA* Volume: 178 Pages: 141-146 Published: FEB 1 2018

2017

Vyslouzilova, Lucie; Buzgo, Matej; Pokorny, Pavel; et al. Needleless coaxial electrospinning: A novel approach to mass production of coaxial nanofibers, *INTERNATIONAL JOURNAL OF PHARMACEUTICS* Volume: 516 Issue: 1-2 Pages: 293-300 Published: JAN 10 2017

2016

Erben, Jakub; Jencova, Vera; Chvojka, Jiri; et al.: The combination of meltblown technology and electrospinning - The influence of the ratio of micro and nanofibers on cell viability, *MATERIALS LETTERS* Volume: 173 Pages: 153-157 Published: JUN 15 2016, IF 2.572

2015

Erben J., et. al., The combination of meltblown and electrospinning for bone tissue engineering, MATERIALS LETTERS, Volume: 143 Pages: 172-176, 2015, IF 2.489

2014

Pokorny P., Kostakova E., Sanetnik F., Mikes P., Chvojka J., et.el. Effective AC needleless and collectorless electrospinning for yarn production, Physical chemistry chemical letters, Vol. 16, Iss. 48, p 26816 – 26822, IF 4.493

Rampichova, Michala; Buzgo, Matej; Chvojka, Jiri; et al., Cell penetration to nanofibrous scaffolds , CELL ADHESION & MIGRATION Volume: 8 Issue: 1 Pages: 36-41 Published: JAN 1 2014, IF=4,505

Tunak, Maros; Antoch, Jaromir; Kula, Jiri; et al., Estimation of fiber system orientation for nonwoven and nanofibrous layers: local approach based on image analysis, TEXTILE RESEARCH JOURNAL Volume: 84 Issue: 9 Pages: 989-1006 Published: JUN 2014, IF=1,599

2013

Rampichova M., Chvojka J., Buzgo M., Prosecka E., Mikes P., et. al.;Elastic three-dimensional poly (epsilon-caprolactone) nanofibre scaffold enhances migration, proliferation and osteogenic differentiation of mesenchymal stem cells, Cell Proliferation, Vol. 46, Iss. 1, p. 23-37, 2013, IF 3.116

Chvojka, Jiri; Hinstroza, J. P.; Lukas, David, Production of Poly(vinylalcohol) Nanoyarns Using a Special Saw-like Collector , FIBRES & TEXTILES IN EASTERN EUROPE Volume: 21 Issue: 2, Pages: 28-31, Published: MAR-APR 2013, IF=0,541

2011

M. Rampichova, Chvojka J., Prosecka E., Mikes P., Lukas D., Amler E., *MSCS Proliferation and osteogenic differentiation on 2D and 3D PCL Nanofibrous scaffolds*, Int. Journal of Artificial Organs, Vol 34, Issue 8, 654, IF 1.861

H-index and citation index

H-index: 6, Citation index according to database ISI Web of Science: 99, documents by author 31, (to date 5.5.2018)

H-index: 6, Citation index according to database Scopus: 191, documents by author 33, (to date 5.4.2018)

Grants received (last 5 years)

Student grant competition TUL - 2016 FT, Optimization and functionalization of micro-nanofiber tissue carriers for bioprint, investigator Erben, supervisor Chvojka, Grants 414 thousand.

<http://www.tul.cz/document/3868>

Student grant competition TUL - 2011, FT 4845, Development and biological testing nanofiber layers for tissue engineering, principal investigator Chvojka, Grant 126tis.

<http://www.tul.cz/document/711>

Participation in projects

MŠMT ČR: LO1201. 2014-2018. **Development of the Institute for Nanomaterials, Advanced Technology and innovation.** Investigator TUL. Subsidies 184,311 thousand. CZK. Prof. RNDr. David Lukaš, CSc. is involved in three activities: 1. Theoretical and experimental research of the spinning process and the process of blending microfiber and nanofiber construction of test equipment; 2. New structures of machines for the production of fiber and nanofiber structures 3. Equipment for the production of fiber and nanofiber structures. The program aims at developing research infrastructure of the Centre for Nanomaterials, Advanced Technology and Innovation.

<http://www.isvav.cz/projectDetail.do?rowId=LO1201>

MŠMT ČR-EU: ED0005 / 01/01. 2009-2013. **Center for Nanomaterials, Advanced Technology and Innovation.** Investigator TUL. Subsidies 909,840 thousand. CZK.

<http://www.isvav.cz/projectDetail.do?rowId=ED0005%2F01%2F01>

The aim of the project was to build a scientific research infrastructure comparable to European and world standards, which meets today's demanding requirements for cutting-edge research in two key areas: a) material research - focusing on nanomaterials and their applications and research and development of new advanced materials. b) Competitive engineering - focusing mainly on manufacturing machines and robots with mechatronic systems, the new drive unit machines and vehicles, safety engineering design and advanced technology of technical materials.

Jiri Chvojka: Researcher Laboratory for preparation of nanofibres and nanosurfaces. Main activity: R & D in the field of nanofibers and nanomaterials.

TAČR: TA 03010609. 2013-2015. **Nanofibers and nanoparticles abrasives as the basis for a new generation of tools for ultra-fine polishing surfaces.** Principal investigator: Institute of Plasma Physics ASCR, v.v.i. Investigator: Technical University of Liberec, prof. RNDr. David Lukas, PhD. Subsidies TUL 3,060 thousand. CZK. Jiri Chvojka - member research team TUL. Incorporation of the powder material into a nanofibrous fabric. Creating a composite material for polishing hard surfaces.

<http://www.isvav.cz/projectDetail.do?rowId=TA03010609>

GA ČR: P208/12/0105. 2012-2015. **Solutions of polymers in external field: molecular understanding electrospinning.** Investigator: J.E.Purkyně University, prof. RNDr. Ivo Nezbeda, Dr.Cs. Investigator: Technical University of Liberec, prof. RNDr. David Luke, PhD. subsidies TUL, 3196 thousand. CZK. Jiri Chvojka - member research team TUL. The study of the physical principles of electrical alternating spinning known as AC spinning. Spinnability of individual polymers and polymer behavior during electrospinning.

<http://www.isvav.cz/projectDetail.do?rowId=GAP208%2F12%2F0105>

MVO ČR:: VG20102014049. 2010-2014. **Research of possibilities of application of new materials (with a focus on nanomaterials) and advanced technologies to protect people against the effects of CBRN materials, with an emphasis on critical infrastructure.** Coordinating beneficiary / Coordinator: National Institute for Nuclear, Chemical and Biological Protection v.v.i., Ing. Jiří Slabotinský, PhD. Recipient / Manager: TU Liberec, prof. RNDr. David Lukas, PhD. Subsidies TUL 7,398 thousand. CZK. Jiri Chvojka - member research team TUL. Incorporation of the powder material into nanofiber carrier. Creating a composite material for the detection of warfare agents.

<http://www.isvav.cz/projectDetail.do?rowId=VG20102014049>

MŠMT ČR: VaVpl Pre-seed CZ.1.05/3.1.00/14.0308. 2014-2015. **Nanofiber materials for tissue engineering.** Principal investigator: Technical University in Liberec, Ing. Jana Drašarová, Ph.D. Subsidy: 25,073 thousand. CZK. Jiri Chvojka - The technician IPR IA03 composite carriers a combination of electrospinning technology and 3D printing. Head of research activities IA04 fiber material for preparing bone substitutes combining microfiber with nanofibres. Subsidies 2,321 thousand.

<http://www.isvav.cz/projectDetail.do;jsessionid=E8B0BECACEB1E27734DBA22CE6A805DF?rowId=ED3.1.00%2F14.0308> -

MŠMT ČR: centralized development projects. 2013. An integrated system of education in tissue engineering, regenerative medicine and nanotechnology at CU, CTU and TUL. TUL Investigator: prof. RNDr. David Lukas, CSc. Subsidies 2,765 thousand CZK. Jiri Chvojka -

member research team TUL. Training in the production of nanofiber media for tissue engineering.

MŠMT ČR: ME KONTAKT ME 10145. 2010-2012. **Modification of nanofibre materials by plasma technologies for biological applications.** Recipient: Technical University of Liberec; The recipient / Investigator: prof. Ing. Petr Louda, PhD., Faculty of Mechanical Engineering. Co-investigator: prof. RNDr. David Lukas, CSc., Faculty of Textile. The co-: Charles University in Prague. Investigator: doc. RNDr. Evžen Amler, MD., 2nd Medical School, Charles University, Institute of Biophysics. CARSILA project was a joint Polish-Czech project. Cooperating partner: Technical University of Lodz, Faculty of Mechanical Engineering, Department of Materials Engineering, Multilateral Cooperation - ERA-NET. Jiri Chvojka - member research team TUL. Optimization production of nanofiber materials for plasma modification.

<http://www.isvav.cz/projectDetail.do?rowId=ME10145>

Patents and industrial collaboration (last 5 years)

Patents granted by the World Intellectual Property Organization

Kocis, Pokorný, Lukas, Mikes, Chvojka, Kostakova, Beran, Bilek, Valtera, Method for production of polymeric nanofibers by spinning of solution or melt of polymer in electric field, and a linear formation from polymeric nanofibers prepared by this method, **WO2014094694 A1.**

Patents granted by the Industrial Property Office

Pokorný P. Lukáš D. Mikeš P. Vysloužilová L. Chvojka J. Hégrová B. Lukáš R. Amler E. Buzgo M. Louda P. (2011) Method of producing functional nanofibrous layer and apparatus for making the same, patent CZ 302901,

Kočíš L. Pokorný P. Lukáš D. Mikeš P. Chvojka J. Košťáková E. Beran J. Bílek M. Valtera J. Amler E. Buzgo M. Míčková A. Process for preparing polymeric nanofibers by spinning a solution of polymer melt in electric field and linear form of polymeric nanofibers prepared in such a manner, patent, CZ 304137

Chvojka, Mikeš, Sanetrník, Erben, Lukáš (2013) Method of preparing three-dimensionally shaped layer of polymeric nanofibers and method of covering a three-dimensionally shaped surface of a body by three-dimensionally shaped layer of polymeric nanofibers, patent 305569

Chvojka J. Lukáš D. Košťáková E. Mikeš P. Pokorný P. Brustmann (2013), Layered material/fabric for polishing hard surfaces, utility model 27192,

Chvojka, Košťáková, Lukaš, Šafka, Kříž, (2014) 3D composite material intended particularly as biologically degradable replacement of cartilage, utility model 27202

Chvojka J. Lukáš D. Košťáková E. Mikeš P. Pokorný P. Chaloupek J. Saterník F. (2014) Nanofibrous material with incorporated particles, utility model 28410,

Lukáš D. Mikeš P. Kuželová-Košťáková E. Pokorný P. Novák O. Sanetrník F. Chvojka J. Havlíček J. Jenčová V. Horáková J. Blažková L. Pilařová K. Erben J. Kovačičin J. (2014) Apparatus to manufacture composite textile material containing polymeric nanofibers, utility model 28190,

Chvojka, Lukáš, Kuželová Košťáková, Mikeš, Pokorný, Blažková (2015) Filler for polishing wheels, utility model 27933

Chvojka, Lukáš, Kuželová Košťáková, Mikeš, Pokorný, Blažková, (2015) Vessel replacement, especially small-diameter vessel replacement, utility model 28387

Cooperation with industry

Contract research Technical University in Liberec **Zentiva (Sanofi)**: Research and development ODF films in 2015 - 2016. The total volume of CZK 1.3 mil. KČ investigator Chvojka.

MPO ČR: OPPI - CZ.1.03/5.1.00/12.00018. NANOPROGRES. 2011-2014. Prof. David Lukáš, a member of the steering committee leading professional advice and expert guarantor no. 1. **The development of reproducible methods for the production of nanofibers of the "core / shell"**. Jiri Chvojka - member research team TUL. Optimization of the production technology and the preparation of materials.

<http://nanoprogres.cz/cs/podnikatelsky-program/zakladni-model-klastru-nanoprogres-podnikatelskyD>

Internships abroad

Budapest University of Technology and Economics, 2010-2011 Topic: Creation of nanofibrous layers for carbon composite materials. (short-term internship)

ENSAIT, Ecole d'Ingénierie et d'Innovation Textile depuis 1881, 2008-2009, France. Topic: Creating a composite material for improvement of the existing textiles filters. (6 month)

Honours and awards

Crytur prize for the best thesis in material sciences 2015 - Martin Pelcl: **Combination of 3D printing and nanofibers for tissue engineering articular cartilage**. Supervisor of the best thesis in materials science 2014/2015.

Rector's Award for the best thesis in 2014 Jakub Erben - **Development and study the structure of bulk micro-nanofiber layers for medical applications**. Supervisor Chvojka

SVOČ 2014 - Martin Pelcl: **Combination of 3D printing and nanofibers for tissue engineering articular cartilage**, 4th place (Ing.), Supervisor Chvojka

SVOČ 2012 - Jakub Erben **Development and testing of technologies for coating three-dimensional structures of nanofibers**, 2nd place (Bc.) Head Chvojka

SVOČ 2012 - Marcela Cudlínová: **Cultivation of yeast in nanofiber layers**, 1st place (Ing.), Head Chvojka

Other experience

IUPESM 2018 Congress Scientific Committee member

Jiri Chvojka a member of the World Congress on Medical Physics & Biomedical Engineering, see www.iupesm2018.org/committees.page

Participation in organizing prestigious conferences

In spring 2014, Faculty of Textile Technical University in Liberec company called "The Fiber Society", see <https://www.thefibersociety.org/Home/tabid/56/language/en-US/Default.aspx>, to organize a technical conference in as a specialized symposium on the theme "Fibers for Progress". These conferences are usually held in the United States or under the auspices of professionally strong local organization (assigned), who assumes responsibility for vocational and technical program. Expert guarantors of the conference (conference chairs) was prof. David Lukáš, doc. Eva Košťáková and Ing. Petr Mikes, Ph.D. Chvojka J.: judge the quality of the contributions.