

## Dr. Vladislav SEMAK

### Personal Data

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(Danube University Krems)  
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### Current Position

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**Since 01/2020** **Researcher**

Project title: *Adsorption und Detektion von Extrazellulären Vesikeln durch Protamin-funktionalisierte Oberflächen.*  
Funding agency: Government of Lower Austria and the European Regional Development Fund.  
Principal Investigator: Dr. Vladislav Semak  
Center: Center for Biomedical Technology, **University for Continuing Education Krems** (Danube University Krems), Austria

### Work Experience

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**01/2017-12/2020** **Researcher**

Project title: *Funktionalisierbare, blutkompatible Polymere für die Vollblutapherese, insbesondere für die Lipidapherese.*  
Funding agency: Government of Lower Austria and the European Regional Development Fund.  
Principal Investigator: Prof. Viktoria Weber  
Center: Center for Biomedical Technology, **University for Continuing Education Krems** (Danube University Krems), Austria

**01/2018-12/2019** **Researcher**

Project title: *Neuartige oberflächenfunktionalisierte Polymere mit angepasster Porosität für die Entfernung von Zytokinen.*  
Funding agency: Österreichische Austauschdienst (OeAD-GmbH)  
Principal Investigator: Dr. Vladislav Semak  
Center: Center for Biomedical Technology, **University for Continuing Education Krems** (Danube University Krems), Austria

**09/2015-12/2016** **Postdoctoral researcher**

Field of Interest: *Development of Methacrylate-Based Adsorbents for Whole Blood Apheresis.*  
Director: **Prof. Viktoria Weber**  
Center: Center for Biomedical Technology, **University for Continuing Education Krems** (Danube University Krems), Austria

- 07/2013-07/2015 Postdoctoral researcher**  
Field of Interest: *Chemical Functionalization of Bio-Ceramics to Enhance Endothelial Cells Adhesion for Tissue Engineering.*  
Director: **Prof. Sandrine Gerber**  
Center: Group for Functionalized Biomaterials, **École Polytechnique Fédérale de Lausanne (ETH-Lausanne)**, Switzerland
- 02/2012-07/2013 Researcher**  
Field of Interest: *Zwitterionic Polymers, Encapsulation Methods, Chitosan Nanoparticles.*  
Director: Ing. Igor Lacík, DrSc.  
Center: Department for Biomaterials Research, Polymer Institute, **Slovak Academy of Sciences**, Bratislava, Slovakia
- 2007-2012 PhD in Organic Chemistry**  
Thesis title: *Synthesis of 1S-Ethyl-4-Substituted Quinolizidines and Other Potentially Bioactive Compounds.*  
Director: Prof. Carmen Escolano, PhD  
Center: Laboratory of Organic Chemistry, Faculty of Pharmacy, **University of Barcelona**, Spain

## Education

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- 09/2008 Master (MSc.) in Experimental Pharmaceutical Sciences**  
Thesis title: *Enantioselective Synthesis of Indolizidine and Quinolizidine Alkaloids. Towards the First Enantioselective Synthesis of Quinolizidine Alkaloid (-)-2071.*  
Directors: **Prof. Mercedes Amat, PhD and Prof. Carmen Escolano, PhD**  
Center: Faculty of Pharmacy, **University of Barcelona**, Spain
- 07/2008 Advanced Study Diploma (DEA)**  
Center: Faculty of Pharmacy, **University of Barcelona**, Spain
- 05/2006 Master (Mgr.) in Organic Chemistry**  
Thesis title: *Synthesis and Reactivity of 2-Hydroxy-1-Tetralones. Chiral Auxiliaries in the Synthesis of  $\alpha$ -Amino Acids.*  
Director: **Doc. M. Sališová, PhD**  
Center: Faculty of Natural Sciences, **Comenius University**, Bratislava, Slovakia
- 06/2004 Bachelor (BSc.) in Chemistry**  
Center: Faculty of Natural Sciences, **Comenius University**, Bratislava, Slovakia
- 06/2001 Graduation in Medicinal Chemistry**  
Center: Secondary School of Industrial Chemistry, Bratislava, Slovakia

## Fellowships

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- 09/2015 – 05/2016 Ernst Mach Grant** provided by OeAD-GmbH (Austria)
- 2007-2011 FPU fellowship** provided by Spanish Ministry of Education
- 06/2010 - 10/2010 FPU-estancia breve fellowship** provided by Spanish Ministry of Education

## International Studentships

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**06/2010 - 10/2010** Chemistry Department, **Brock University**, St. Catharines, Ontario, **Canada**

Supervisor: **Prof. Tomáš Hudlický, PhD**

**03/2005 - 07/2005** Faculty of Pharmacy, **University of Barcelona**, Spain

Supervisor: **Prof. C. Escolano; Prof. M. Amat, PhD and Prof. J. Bosch, PhD**

## Teaching

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- Laboratory Practicum: *Experiments in Organic Chemistry and Pharmacy*, University of Barcelona
- Supervision of master and PhD students

## Reviewing Activities

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<i>Carbon</i>	Outstanding reviewer since 2018
<i>Journal of Applied Biomedicine</i>	Outstanding reviewer since 2017
<i>Acta Biomaterialia</i>	Recognized reviewer since 2019
<i>Polymers</i>	Recognized reviewer since 2021
<i>Membranes</i>	Recognized reviewer since 2021
<i>ÖGMBT Life Science PhD Awards</i>	Jury member 2020 and 2021

## Selected Memberships

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European Society for Artificial Organs (ESAO)	Since 2021
Austrian Association of Molecular Life Sciences and Biotechnology (ÖGMBT)	Since 2020
Slovak Chemical Society (SChS)	Since 2004

## Languages

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<b>Slovak</b>	Maternal language
<b>Russian</b>	Maternal language
<b>English</b>	C1
<b>Spanish</b>	C1
<b>German</b>	B1

## Manuscripts

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1. **Semak, V.\***; Eichhorn, T.; Weiss, R.; Weber, V. "Polyzwitterionic Coating Increases the Blood Compatibility of Hydrophobic Polystyrene-Based Adsorbents for Therapeutic Apheresis" *Biomacromolecules* **2022**, submitted.
2. Ebeyer-Masotta, M.; Eichhorn, T.; Weiss, R.; **Semak, V.**; Lauková, L.; Fischer, M. B.; Weber, V. "Heparin-Functionalized Adsorbents Eliminate Central Effectors of Immunothrombosis, Including Platelet Factor 4, High Mobility Group Box 1 Protein, and Histones" *Int. J. Mol. Sci.* **2022**, accepted.
3. George, S. K.; Lauková, L.; Weiss, R.; **Semak, V.**; Fendl, B.; Weiss, V. U.; Steinberger, S.; Allmaier, G.; Tripisciano, C.; Weber, V. "Comparative Analysis of Platelet-derived Extracellular Vesicles Using Flow Cytometry and Nanoparticle Tracking Analysis" *Int. J. Mol. Sci.* **2021**, 22 (8), 3839.
4. Ettenauer, J.; **Semak, V.**; Brandl M. "Synthesis of Fluorescein Aldehydes for the Sensitive Detection of L-Cysteine" *Proceedings* **2018**, 2, 895.
5. **Semak, V.**; Fischer, M. B.; Weber, V. "Biomimetic Principles to Develop Blood Compatible Surfaces" *Int.*

*J. Artif. Organs* **2017**, *40*, 22-30.

6. Lacík, I.; Stach, M.; Kasák, P.; **Semak, V.**; Uhelská, L.; Chovancová, A.; Reinhold, G.; Kilz, P.; Delaittre, G.; Charleux, B.; Chaduc, I.; D'Agosto, F.; Lansalot, M.; Gaborieau, M.; Castignolles, P.; Gilbert, R. G.; Szablan, Z.; Barner-Kowollik, Ch.; Hesse, P.; Buback, M. "SEC Analysis of Polyacrylic and Polymethacrylic Acid" *Macromol. Chem. Phys.* **2015**, *216*, 23-37.
7. Hrobárik, P.; Hrobáriková, V.; **Semak, V.**; Kasák, P.; Rakovský, E.; Polyzos, I.; Fakis, M.; Persephonis, P. "Quadrupolar Benzobisthiazole-Cored Arylamines as Highly Efficient Two-Photon Absorbing Fluorophores" *Org. Lett.* **2014**, *16*, 6358-6361.
8. Bertok, T.; Klukova, L.; Sediva, A.; Kasák, P.; **Semak, V.**; Micusik, M.; Omastova, M.; Chovanová, L.; Vlček, M.; Imrich, R.; Vikartovska, A.; Tkac, J. "Ultrasensitive Impedimetric Lectin Biosensors with Efficient Antifouling Properties Applied in Glycoprofiling of Human Serum Samples" *Anal. Chem.* **2013**, *85*, 7324-7332.
9. Asó, E.; Semakova, J.; Joda, L.; **Semak, V.**; Halbaut, L.; Calpena, A.; Escolano, C.; Perales, J. C.; Ferrer, I. "Triheptanoin Supplementation to Ketogenic Diet Curbs Cognitive Impairment in APP/PS1 Mice Used as a Model of Familial Alzheimer's Disease" *Curr. Alzheimer Res.* **2012**, *10*, 209-297.
10. Amat, M.; **Semak, V.**; Escolano, C.; Molins, E.; Bosch, J. "Enantioselective, Protecting Group-Free Synthesis of 1S-Ethyl-4-Substituted Quinolizidines" *Org. Biomol. Chem.* **2012**, *10*, 6866-6875.
11. **Semak, V.**; Semakova, J.; Halbaut, L.; Asó, E.; Ferrer, I.; Calpena, A.; Escolano, C.; Perales, J. C. "Synthesis of Triheptanoin and Formulation as a Solid Diet for Rodents." *Eur. J. Lipid Sci. Technol.* **2012**, *114*, 889-895.
12. **Semak, V.**; Metcalf, T. A.; Endoma-Arias, M. A. A.; Mach, P.; Hudlicky, T. "Toluene Dioxygenase Mediated Oxidation of Halogen-Substituted Benzoate Esters" *Org. Biomol. Chem.* **2012**, *10*, 4407-4416.
13. Arróniz, C.; Gil-González, A.; **Semak, V.**; Escolano, C.; Bosch, J.; Amat, M. "Cooperative Catalysis for the First Asymmetric Formal [3+2] Cycloaddition Reaction of Isocynoacetates to  $\alpha,\beta$ -Unsaturated Ketones" *Eur. J. Org. Chem.* **2011**, 3755-3760 (highlighted in: *ChemInform* **2011**, *42*, 49-109).
14. Hudlicky, R. J.; Werner, L.; **Semak, V.**; Simionescu, R.; Hudlicky, T. "Dauben - Michno Oxidative Transposition of Allylic Cyanohydrins - Enantiomeric Switch of (-)-Carvone to (+)-Carvone" *Can. J. Chem.* **2011**, *89*, 535-543.
15. **Semak, V.**; Escolano, C.; Arróniz, C.; Bosch, J.; Amat, M. "A Practical Procedure for the Removal of the Phenylethanol Moiety from Phenylglycinol-Derived Lactams" *Tetrahedron: Asymmetry* **2010**, *21*, 2542-2549 (highlighted in: *ChemInform* **2011**, *42*, 17-151).
16. Pažický, M.; **Semak, V.**; Gášpár, B.; Bílešová, A.; Sališová, M.; Boháč, A. "Efficient Synthesis of 2-Alkyl-2-Hydroxy-6-X-1-Tetralones" *Arkivoc* **2008**, *8*, 225-241.
17. **Semak, V.**; Boháč, A.; Sališová, M.; Addová, G.; Danko, P. "Preparation of  $\alpha$ -Methyl- $\gamma$ -Butyrolactone: Mechanism of its Formation and Utilization in 2-Methyl-1-Tetralone Synthesis" *Chem. Pap.* **2008**, *62*, 275-280.

#### Selected Congress Contributions

- **Semak, V.**; Eichhorn, T.; Weiss, R.; Weber, V.: "Polyzwitterionic Coats on Adsorbents for Extracorporeal Therapies" *ESAO Congress 2021*, London, UK (online). 09/2021.
- **Semak, V.**; Weiss, R.; Eichhorn, T.; Fischer, M. B.; Weber, V.: "Polysulfobetainic Coating of Adsorbents for Apheresis" *10<sup>th</sup> International BioNanoMed 2019 Congress*, Graz, Austria. 04/2019.
- **Semak, V.**; Weiss, R.; Tripisciano, C.; Fendl, B.; Harm, S.; Fischer, M. B.; Hartmann, J.; Weber, V.: "Protamine Beads for the Adsorption of Extracellular Vesicles" *9<sup>th</sup> International BioNanoMed 2018 Congress*, Graz, Austria. 04/2018.