

Германо-белорусский научно-исследовательский проект
с финансовой поддержкой через Международное бюро ВМВФ

**Разработка биоаффинных поверхностей как средства
детекции биомаркеров для предсказания,
диагностики и мониторинга заболеваний**

Entwicklung von Bio-affinitätsflächen zum Nachweis von
Proteom-Biomarkern zur Vorhersage, Diagnose und
Verlaufsbestimmung von Erkrankungen

2009-2010

Vadim Shmanai, *Ph.D.*,

*Institute of Physical organic chemistry,
National Academy of Sciences of Belarus*

Participants of the project

- **University of Potsdam**, Institute of nutrition.

Institut für Ernährungswissenschaft.

Lehrstuhl für Physiologie und Pathophysiologie der Ernährung.

Prof. Dr. F. J. Schweigert;

- **BioAnalyt GmbH**, spin-off company,
University of Potsdam University of Potsdam;

- **Institute of Physical organic chemistry**,
Group for chemistry of bionojugates and
molecular biotechnology.



German partners

Prof. Florian J. Schweigert



Background of the project

1. **2001.** A paper in an international publication.
2. **2002-2003.** Correspondence by e-mail.
Visit to Germany.
3. **2004.** Search for a grant.
4. **2005-2007.** project «Biomarkers»
Foundation: Arbeitsgemeinschaft industrieller
Forschungsvereinigungen 'Otto-von-Guericke' e.V. (AiF);
contract/grant: ProINNO II.
5. **2007-2008.** «EisenEx» 'Otto-von-Guericke' e.V. (AiF).
6. **2008.** Information from Belarusian office of 7th FP.

Scientific background of the project

molecular biology – life sciences

Genomics: *genome* (genes: codes of protein structure);

Proteomics: *proteome* (proteins: structure, function in organisms).

The main instrument: mass-spectrometry of proteins;

Metabolomics: metabolome (products of metabolism: influence of metaboloms on function of proteins).

Organization of the project

Potsdam:

experience in proteomics; modern instruments (mass-spectrometers)

+

Minsk:

experience in creating of bio-affinity surfaces

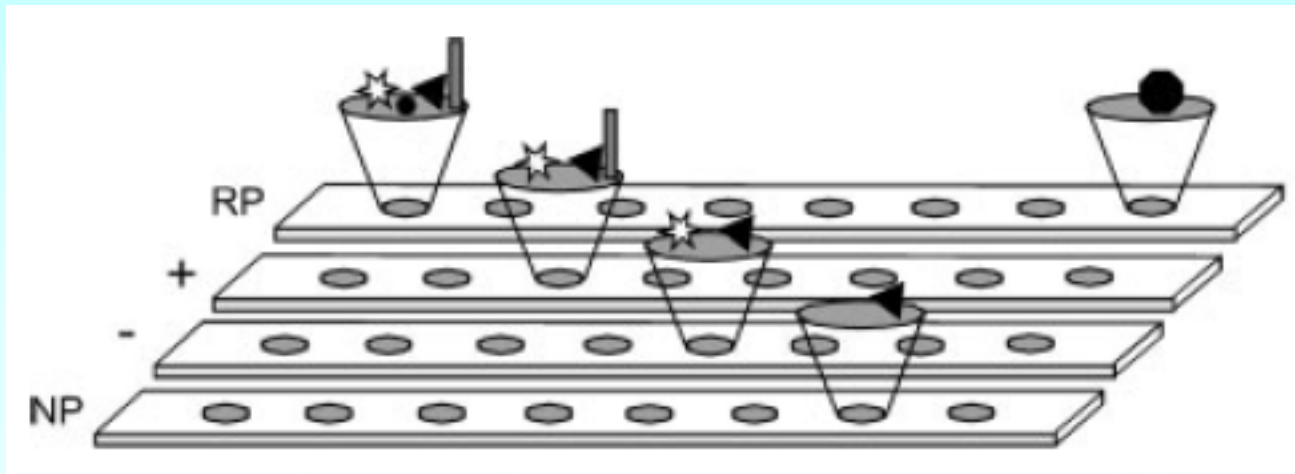
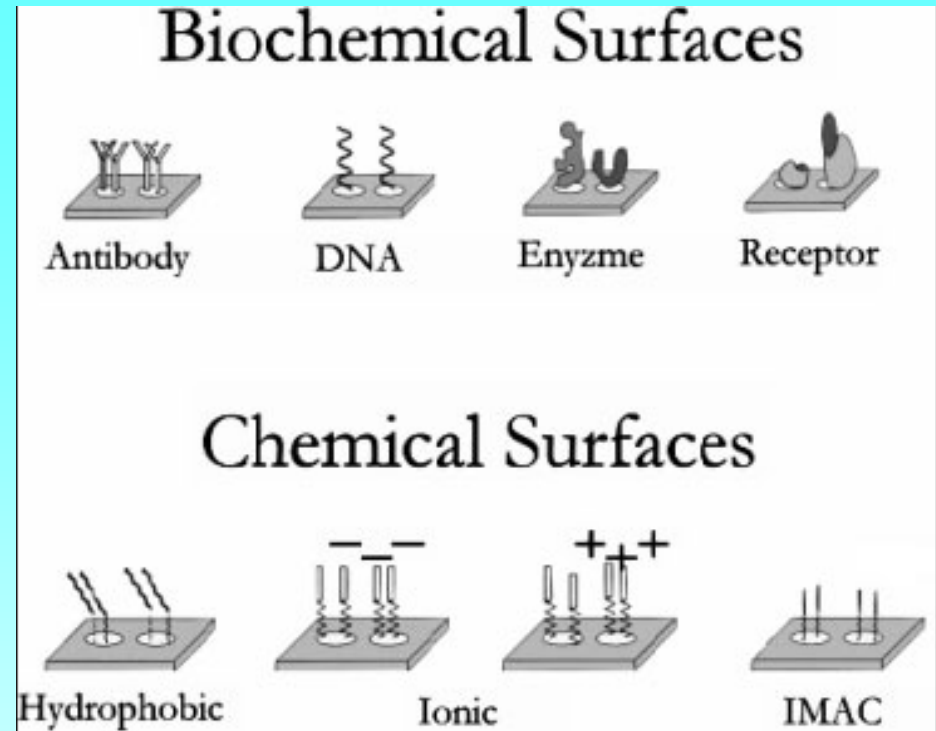
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New level in proteomic research,
innovation techniques.

Proteomics:

Mass-spectrometry of proteins
(MALDI-TOF).

Chips (targets)



Prior results

1. Chemical modification of aluminium surface for mass-spectrometry targets.
2. Development of surfaces for specific binding of glyco-proteins.
3. Highly efficient express-method for model proteins modified with sugars (main proteome elements responsible for diabet complications).

Publications

RAPID COMMUNICATIONS IN MASS SPECTROMETRY

Rapid Commun. Mass Spectrom. 2007; **21**: 1–6

Published online in Wiley InterScience (www.interscience.wiley.com) DOI: 10.1002/rcm.2793

RCM

Application of phenylboronic acid modified hydrogel affinity chips for high-throughput mass spectrometric analysis of glycated proteins

Sergey Gontarev^{1,3}, Vadim Shmanai^{1,3}, Simone K. Frey², Maksim Kvach^{1,3}
and Florian J. Schweigert^{1,2*}

¹Bioanalyt GmbH, Arthur-Scheunert-Allee 114–116, 14558 Nuthetal, Germany

²Department of Physiology and Pathophysiology, Department of Nutritional Science, University of Potsdam, Arthur-Scheunert-Allee 114–116, 14558 Nuthetal, Germany

³Institute of Physical Organic Chemistry, National Academy of Sciences of Belarus, Surganova str. 13, Minsk 220072, Rep. of Belarus

JOURNAL OF MASS SPECTROMETRY

J. Mass Spectrom. 2007; **42**: 1504–1513

Published online 27 July 2007 in Wiley InterScience
(www.interscience.wiley.com) DOI: 10.1002/jms.1259

JMS

Modification of aluminum chips for LDI mass spectrometry of proteins

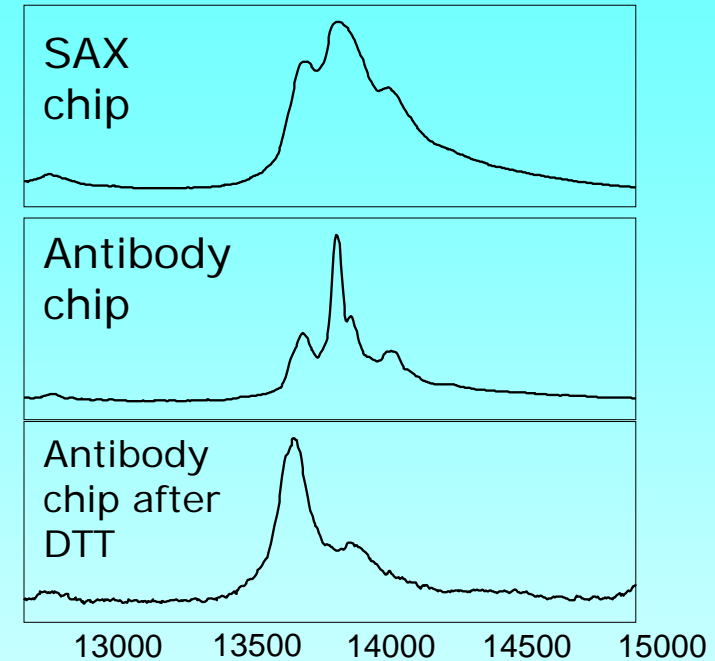
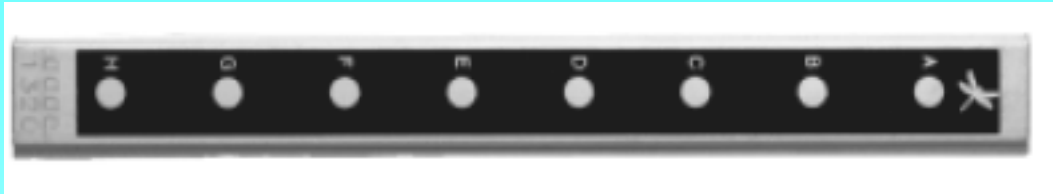
Vadim Shmanai,^{1,3*} Sergey Gontarev,^{1,3} Simone K. Frey² and Florian J. Schweigert²

¹ BioAnalyt GmbH, Arthur-Scheunert-Allee 114–116, 14558 Nuthetal, Germany

² Department of Physiology and Pathophysiology, Department of Nutritional Science, University of Potsdam, Arthur-Scheunert-Allee 114–116, 14558 Nuthetal, Germany

³ Institute of Physical Organic Chemistry, National Academy of Sciences of Belarus, Surganov str. 13, Minsk 220072, Rep. of Belarus

Content of the project

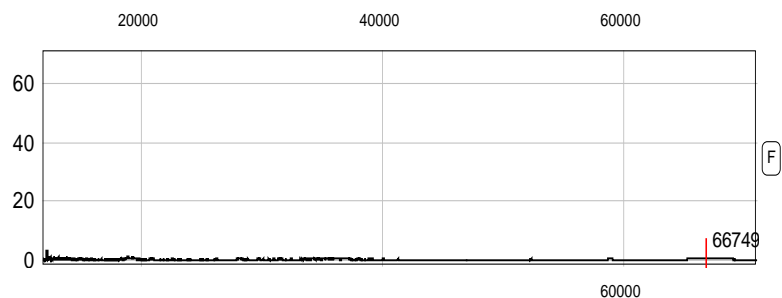
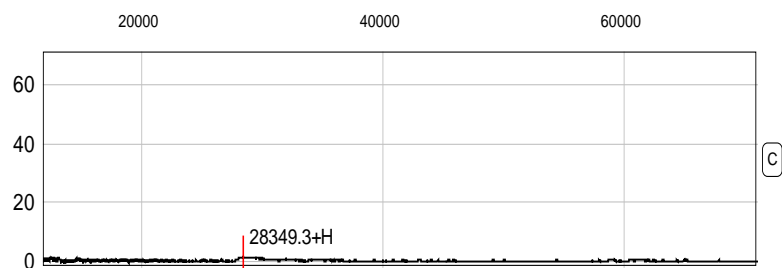
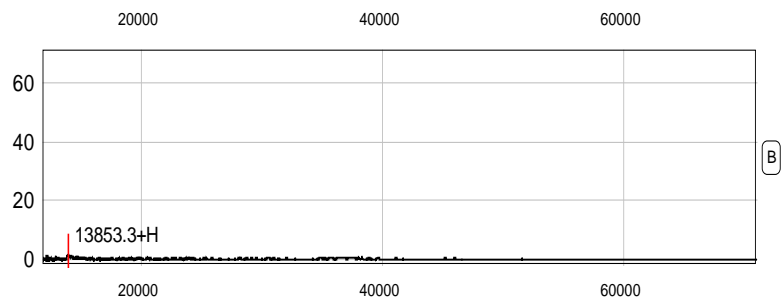


Antobodies – mostly specific receptors.

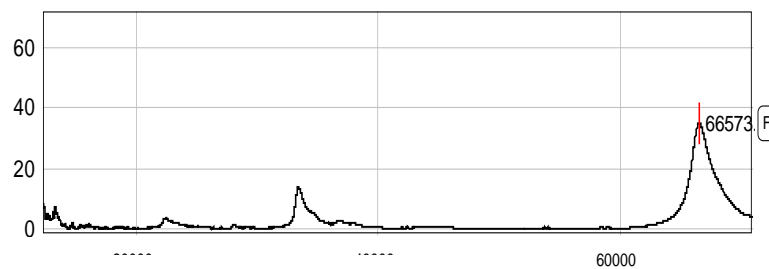
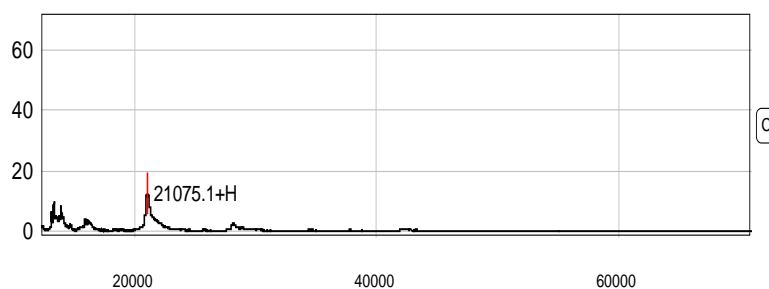
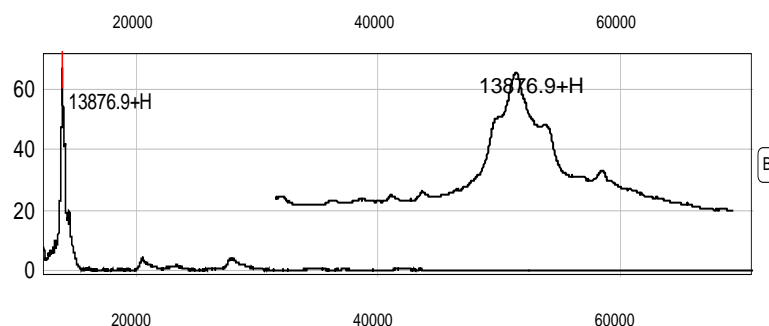
Development of methods for modification of mass-spectrometry targets with specific antibodies.

Results of the project

Ciphergen Surface Modification



Noval Surface Modification



Plans:

- 1. Diagnostics and monitoring of diabetes:** from models to real bio-samples.
- 2. Mass-spectrometry of proteins:** development of universal bio-affinity surfaces.
- 3. Immobilized antibody:** development of innovative bio-analytical systems.

How to enhance co-work?

- Financial support of publications;
- Financial support of short visits;
- Search of partners and information about grants and programs;
- Correct examination of projects;
- Getting young scientists to take part in co-work;
- Parallel financial support;
- Simplification of moving of equipment and materials;
- Changing of approach to participation of small companies in Belarus.

Share results!

- Publications;
- Transfer of materials and methods;
- Seminars.

Institut für Chemie und Biochemie
Freie Universität Berlin
Thielallee 63, D-14 195 Berlin

5 November 2010 г.



Biochemie



Arbeitsgruppen

Ehemalige Hochschullehrer

Studium / Lehre

Core Facility

Home » Biochemie » Lise-Meitner Kolloquium » Vadim Shmanai Ph.D.
Institute of Physical Organic Chemistry, Minsk, Belarus



Vadim Shmanai Ph.D.

Institute of Physical Organic Chemistry, Minsk, Belarus

05.11.2010, 12:30 Uhr

"Expanding the toolbox - a proposal of reagents and materials for biochemistry, molecular biology, proteomics and nanotechnology"

Institut für Chemie und Biochemie, Hahn-Meitner-Bau

Lise-Meitner-Hörsaal, Thielallee 63, 14195 Berlin

СПАСИБО ЗА ВНИМАНИЕ!

VIELEN DANK FÜR IHRE AUFMERKSAMKEIT!

THANK YOU FOR YOUR ATTENTION!