



GLYCOPHARM

The Sugar Code:
from bio(chemical) concept to clinics

Newsletter

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Newsletter

April 2014
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EDITORIAL

Welcome

Dear Reader,

Welcome to the fourth issue of the GLYCOPHARM newsletter.

GLYCOPHARM is a Marie Curie Initial Training Network devised to offer training in scientific, entrepreneurial and transferable skills to thirteen young researchers in the field of glycosciences. Twelve of them have already joined the network and the recruitment process for covering the remaining position is under progress, so our network will be complete very soon. The 3rd GLYCOPHARM meeting, hosted by the partner Toscana Biomarkers in Siena, was an excellent opportunity for most of the young researchers to know each other and share experiences. In addition to the workshop and courses programed for this meeting, a visit to the facilities of TBM, located at the bio-incubator of Toscana Life Sciences Foundation, enabled the early-stage researchers to get familiar with the innovation philosophy of a company incubator.

In the last four months, different dissemination and outreach activities have been carried out by senior and young researchers of our network. In this issue, you can read about the activity organized by Sonsoles Martín-Santamaría (USP-CEU) for introducing school-aged children to the wonders of atoms and molecules. A lovely initiative! You will also find information on GLYCOPHARM publications and upcoming events, which include the 4th network meeting that will be co-organized by the three partners from Germany (LMU, UKL-HD and ROCHE), and the Mid-Term Review meeting with the EC Project Officer, for assessment of the progress of the project. The next issue of our newsletter will bring you details on these important events. But if you want to know more before, visit our website!

Dr. Dolores Solís

Coordinator of GLYCOPHARM



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GLYCOPHARM CONSORTIUM

Partners



CSIC - Spain (Coordinator)

Agencia Estatal Consejo Superior de Investigaciones Científicas

<http://www.csic.es>



USP-CEU - Spain

Fundación Universitaria San Pablo - CEU

<http://www.ceu.es>



NUID-UCD - Ireland

National University of Ireland at Dublin - University College Dublin

<http://www.ucd.ie>



LMU - Germany

Ludwig-Maximilians Universität Muenchen

<http://www.en.uni-muenchen.de>



UMINHO - Portugal

Universidade do Minho

<http://www.uminho.pt>



CUNI - Czech Republic

Univerzita Karlova V Praze

<http://www.cuni.cz>



UKL-HD - Germany

Universitätsklinikum Heidelberg

<http://www.klinikum.uni-heidelberg.de>



IAB - Czech Republic

Institute of Applied Biotechnologies a.s.

<http://www.iabio.cz>



TBM - Italy

Toscana Biomarkers Srl

<http://www.toscanabiomarkers.com/en>



We Innovate Healthcare

ROCHE - Germany

Roche Diagnostics GMBH

<http://www.roche.com>



HokU - Japan (Associated partner)

Hokkaido University

<http://www.oia.hokudai.ac.jp>



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RECRUITMENT

Newly Recruited Researchers



ER

Peter Kisfali

Institute of Applied Biotechnologies a.s.

Project: Gene expression and quantification (Supervisors: Milan Press and Petr Kvapil).

Started on 01/02/14



ESR

Gabriel García

Ludwig-Maximilians Universität Muenchen

School of Chemistry and Chemical Biology

Project: Production and development of galectins and engineered variants. Biological screening (Supervisor: Hans-Joachim Gabius).

Started on 16/02/13



ER

Michelle Yegres

Roche Diagnostics GMBH

Project: Search for functional markers (Supervisor: Dietmar Reusch).

Started on 01/03/14



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PUBLICATIONS

New publications

- **H, C, and N backbone and side-chain chemical shift assignments for the 36 proline-containing, full length 29 kDa human chimera-type galectin-3**

Ippel H., Miller M.C., Berbís M.A., Suylen D., André S., Hackeng T.M., Cañada F.J., Weber C., Gabius H.-J., Jiménez-Barbero J. and Mayo K.H.

Journal Article: 2014 Feb 7. *Biomol NMR Assign* [Epub ahead of print]

- **Natural single amino acid polymorphism (F19Y) in human galectin-8: detection of structural alterations and increased growth-regulatory activity on tumor cells**

Ruiz F.M., Scholz B.A., Buzamet E., Kopitz J., André S., Menéndez M., Romero A., Solís D. and Gabius H.-J.

Journal Article: 2014 Mar. *FEBS J* 281(5):1446-1464.

- **Modulation of CD14 and TLR4·MD-2 Activities by a Synthetic Lipid A Mimetic**

Cighetti R., Ciaramelli C., Sestito S.E., Zanoni I., Kubik L., Ardá-Freire A., Calabrese V., Granucci F., Jerala R., Martín-Santamaría S., Jiménez-Barbero J. and Peri F.

Journal Article: 2014 Jan 24. *ChemBioChem* 15(2):250–258.

- **Introduction to glycopathology: the concept, the tools and the perspectives**

Gabius H.-J. and Kayser K.

Journal Article: 2014 Jan 20. *Diagn Pathol* 9:4.

- **Combining glycocluster synthesis with protein engineering: an approach to probe into the significance of linker length in a tandem-repeat-type lectin (galectin-4)**

André S., Wang G.N., Gabius H.-J. and Murphy P.V.

Journal Article: 2014 Jan 11. *Carbohydr Res.*

- **Peptides derived from human galectin-3 N-terminal tail interact with its carbohydrate recognition domain in a phosphorylation-dependent manner**

Berbís M.A., André S., Cañada F.J., Pipkorn R., Ippel H., Mayo K.H., Kubler D., Gabius H.-J. and Jiménez-Barbero J.

Journal Article: 2014 Jan 3. *Biochem Biophys Res Commun* 443(1):126-131.

- **Human tandem-repeat-type galectins bind bacterial non-βGal polysaccharides**

Knirel Y.A., Gabius H.-J., Blixt O., Rapoport E.M., Khasbiullina N.R., Shilova N.V. and Bovin N.V.

Journal Article : 2014 Jan. *Glycoconj J* 31(1):7-12.



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PUBLICATIONS

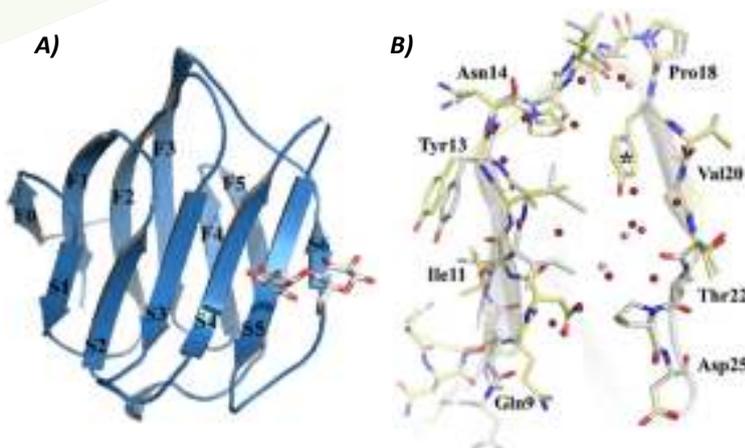
Selected publication

Natural single amino acid polymorphism (F19Y) in human galectin-8: detection of structural alterations and increased growth-regulatory activity on tumor cells

Ruiz F.M., Scholz B.A., Buzamet E., Kopitz J., André, S., Menéndez M., Romero A., Solís D., Gabius H.-J.

Journal Article: 2014 Mar. FEBS J 281(5):1446-1464.

ABSTRACT: Natural amino acid substitution by single-site nucleotide polymorphism can become a valuable tool for structure-activity correlations, especially if evidence for association to disease parameters exists. Focusing on the F19Y change in human galectin-8, connected clinically to rheumatoid arthritis, we here initiate the study of consequences of a single-site substitution in the carbohydrate recognition domain of this family of cellular effectors. We apply a strategically combined set of structural and cell biological techniques for comparing properties of the wild-type and variant proteins. The overall hydrodynamic behavior of the full-length protein and of the separate N-domain is not noticeably altered, but displacements in the F0 beta-strand of the beta-sandwich fold in the N-domain are induced, as evidenced by protein crystallography. Analysis of thermal stability by circular dichroism spectroscopy revealed perceptible differences for the full-length proteins, pointing to an impact of the substitution beyond the N-domain. In addition, small differences in thermodynamic parameters of carbohydrate binding are detected. On the level of two types of tumor cells, characteristics of binding appeared rather similar. In further comparison of the influence on proliferation, the variant proved to be more active as growth regulator in the six tested lines of neuroblastoma, erythroleukemia and colon adenocarcinoma. The seemingly subtle structural change identified here thus has functional implications in vitro, encouraging further analysis in autoimmune regulation and, in a broad context, in work with other natural single-site variants, using the documented combined strategy.



A) Crystallographic structure of the N-domain of wild-type hGal-8. Ribbon model of the domain in complex with lactose, showing the two sets of antiparallel β -strands (F0–F5 and S1–S6) that form the β -sandwich motif.

B) Detailed comparison of the relative positioning of F0 and S1 strands in the F19Y mutant (in yellow) and wild-type N-domains (in light grey). Residue 19 is labelled with an asterisk, and water molecules in the structure of the mutant protein are shown as pink spheres.



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PAST EVENTS

GLYCOPHARM 3rd Network Meeting in Siena

The 3rd GLYCOPHARM Network Meeting was hosted by Toscana Biomarkers (TBM) at the Scuola Superiore Santa Chiara in Siena from 27 to 29 January 2014. The meeting was organized with the kind collaboration of all the TBM team, including the experienced researcher recruited by the company, Enrico Koenig, and chaired by Anna Maria Papini. At the beginning of the meeting, the nine researchers recruited at that time introduced themselves, described their research projects and reported on the training received and dissemination/outreach activities carried out. The meeting comprised a course on entrepreneurship and company management and a workshop on the organic synthesis of glycans, both delivered by senior scientists of the network. The second module of the course in Chemical Glycobiology & Biomedicine was also held with the participation of network speakers and external experts. There was time for an interesting visit to the TBM laboratories, located at the bio-incubator of Toscana Life Sciences Foundation, which enabled the early-stage researchers to get familiar with the incubator system. Finally, the third meeting of the Supervisory Board took place at the end of this event.



The GLYCOPHARM young researchers
at the Siena meeting



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PAST EVENTS

“Atoms and molecules”, a tutorial for school-aged children

Sonsoles Martín-Santamaría (USP-CEU) organized a tutorial at the Aquinas American School (Madrid, Spain) for introducing 5th grade primary school (10-year old) students to the wonders of atoms and molecules. Our young researchers Alessandra Lacetera (ESR at USP-CEU) and Silvia Galante (ESR at CIB-CSIC) participated in this enjoyable activity. Using appropriate visualization tools, they showed the three-dimensional structure of molecules such as glucose, water in its three states (solid, liquid, gas), graphite, diamond, silk, and DNA to their very interested audience.



S. Galante, A. Lacetera and S. Martín-Santamaría showing the 3D structures of glucose and DNA to their young audience



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UPCOMING EVENTS

4th GLYCOPHARM meeting

The 4th GLYCOPHARM Network Meeting will be jointly organized by the three German partners (LMU, UKL-HD and ROCHE) and will be held in Munich/Penzberg from Wednesday, June 25 to Friday, June 27.

In this meeting, emphasis will be given to the following issues:

- Presentations of the recruited researchers
- Training in complementary skills
- Seminars with distinguished guest speakers.

In addition, an interesting visit to ROCHE facilities will be scheduled for the attendees.

We look forward to meeting you there!

Munich/Penzberg, 25-27 June 2014



The Network Meeting hosted by the
German GLYCOPHARM partners



We Innovate Healthcare



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UPCOMING EVENTS

GLYCOPHARM Mid-Term Review meeting

The GLYCOPHARM Mid-Term Review (MTR) meeting will be held on July 4th in Madrid, Spain. The main objective of this meeting is to assess the progress of all aspects (scientific, training, management, etc.) of the Initial Training Network. Particular attention is paid to training activities and networking aspects, including activities across different sectors.

The MTR meeting should be understood as a constructive dialogue between the network participants and the Project Officer. It is a valuable source of feedback to both the consortium and the Research Executive Agency. All recruited fellows and a representative of each partner (including the associated partner) must attend this meeting.

Among other activities, all ESRs and ERs will report on their progress within the GLYCOPHARM network. In particular, in addition to the main objectives of their research projects, methodology used and main results obtained so far, the fellows should briefly present themselves, their background, their training experiences within the network and their expectations on the possible impact on their future careers.

Prior to the MTR meeting a welcome dinner will be organized in order to promote networking among attendees and, very specially, to have a first contact with the Project Officer.

GLYCOPHARM MTR Meeting



VENUE: Colegio Mayor San Pablo (Madrid, Spain)

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Marie Curie Initial Training Network

PITN-GA-2012-317297

<http://www.glycopharm.eu>