



## SCIENTIFIC REPORT

**COST Action:** MultiGlycoNano CM1102 - ECOST-MEETING-CM1102-190413-028676

**Place:** Prague, CZ, Hotel Pyramida, Bělohorská 24, CZ 16901 Praha 6

**Dates:** 19.4. - 21. 4. 2013

**Institution:** Institute of Microbiology, AVCR, v.v.i., Prague

**Responsible person:** Prof. Vladimír Křen

The meeting was attended by the 59 reimbursed participants (from which 2 invited keynote speakers) and 11 local experts, visitors and students, e.g. altogether 70 participants (see attendance list). The meeting was organized as a satellite meeting/pre-conference to the 10<sup>th</sup> Carbohydrate Bioengineering Meeting (21.-24.4.; [www.cbm10.org](http://www.cbm10.org)) to enable broader interaction with the scientific community in the field and to promote COST activities. Also the book of abstract and the program was printed jointly in one abstract book (enclosed) to demonstrate the COST activities to the broader scientific community. The program (see hereunder) was carefully assembled to enable presentation of all working groups stressing mainly active participation of the young scientists also carefully considering gender balance. Besides the lectures, participants were given opportunity to present posters (26 poster communications) that created forum for lively discussions.

Two invited keynote lectures were presented by the top scientists, e.g. Prof. James C. Paulson, USA „*Siglec ligand decorated nanoparticles for in vivo targeting of immune cells*” and Richard Daniellou & Vincent Ferrieres, France „*Development of new biocatalysts for the synthesis of rare furanosides*”.

New group from Turkey that recently joined the Action demonstrated their contribution to the Action (A. Basak Kayitmazer, Turkey „*Differences in the mesoscopic structures of complex coacervates of proteins with flexible and stiff polyelectrolytes*”). A guest speaker from the non-COST country (Argentina) interested in joining this Action presented the work of his group to be able to contribute to the activity of CM1102 Javier D. Breccia, Ar „*Diglycosidases: a promising tool for the synthesis of tailored bioactive compounds*”. During the meeting of the MC it was suggested to start the accession procedure of his Institution to the Action. Also local experts (J. Moravcova) and guests (A. Siriwardena, F and some others) interested in the work of the Action were offered a short presentation at the meeting.

In the frame of the Workshop also a core group meeting, MC meeting and working meetings of respective WGs took place. Social dinner was organized at 20.4. for all participants.

This very successful COST action was strongly promoted to the broad local and international scientific community also thanks to linking to another big international (400 participants) conference.

Prof. Dr. Vladimír Křen  
Local organizer



**Encl.**

Full program & poster list

Attendance lists duly signed

Abstract book

Approved budget of the local organizer support

Cost statement



## Workshop of the ESF COST project MultiGlycoNano CM1102

*Hotel Pyramida Prague, Conference Room III*

Final Programme

**Friday, 19<sup>th</sup> April**

10:00 – 19:00 **Registration** *Hotel Pyramida Prague, Reception Foyer*

### Programme

*Conference Room III*

14:00 – 14:30 **Bruce Turnbull** (UK) & **Vladimír Křen** (Czech Republic) & **Ladislav Petruš** (Slovakia)

Opening, organizational information and information from COST

Chairperson: *Bruce Turnbull, UK*

14:30 – 15:10 **Richard Daniellou**, **Vincent Ferrieres**, France (*Keynote Lecture*)

„Development of new biocatalysts for the synthesis of rare furanosides”

### Presentation of the new group in the COST action MultiGlycoNano

#### CM1102

15:10 – 15:30 **A. Basak Kayitmazer**, Turkey

„Differences in the mesoscopic structures of complex coacervates of proteins with flexible and stiff polyelectrolytes”

#### SESSION 1

##### Enzymatic methods in glycobiology

Chairperson: *Maurice Franssen, The Netherlands*

15:30 – 15:50 **Wolf-Dieter Fessner**, Germany

„Enzyme cascades for the synthesis of multimeric recognition motifs: From fluorescent labeling to runaway block polymerization”

15:50 – 16:10 **Javier D. Breccia**, Argentina

„Diglycosidases: a promising tool for the synthesis of tailored bioactive compounds”

16:10 – 16:30 **Behnam Zolghadr**, Austria

„UDP-sulfoquinovose synthase from the hyperthermoacidophilic archaeon *Sulfolobus acidocaldarius*”

16:30 – 17:00 **Coffee Break** *Hotel Restaurant*

## SESSION2

### Carbohydrate synthesis and multivalency

Chairperson: *Stefan Oscarson*, Ireland

17:00 – 17:20 **Carlo Unverzagt**, Germany

„Synthesis and conjugation of multiantennary *N*-glycan azides”

17:20 – 17:40 **Jitka Moravcová**, Czech Republic

„C-Glycoside functionalized multivalent ligands as potent inhibitors of DC-SIGN lectin“

17:40 – 18:00 **Thisbe K. Lindhorst**, Germany

„Photosensitive multivalent glycomimetics”

18:00 – 18:20 **Reko Leino**, Finland

“Immunostimulatory glycoclusters derived from  $\alpha$ -(1→2)-linked oligomannosides: Recent progress from *in vitro* and *in vivo* studies”

18:20 – 18:40 **Antonio M. Baptista**, Portugal

„Studying the structure of peptide dendrimers by molecular dynamics simulations: branch length, charge, pH and glycosylation”

18:40 – 19:30 **POSTER SESSION I** (all posters will be displayed)

## Free evening

19:30 Core Group meeting *Restaurant Lindner*

## Saturday, 20<sup>th</sup> April

09:00 – 18:00 **Registration** *Hotel Pyramida Prague, Reception Foyer*

### Programme

*Conference Room III*

## SESSION 3

### Carbohydrate-protein interactions

Chairperson: *Lothar Elling*, Germany

09:00 – 09:40 **James C. Paulson**, USA (*Keynote Lecture*)

„Siglec ligand decorated nanoparticles for *in vivo* targeting of immune cells”

09:40 – 10:00 **Anne Imberty**, France

„Influence of lectin valency on surface avidity and glycolipid dynamics in membranes“

10:00 – 10:20 **Michele Fiore**, France

„Tetravalent glycopeptide with nanomolar affinity to wheat germ agglutinin”

10:20 – 10:40 **Franck Fieschi**, France

„Langerin, a C-type lectin from dendritic cells, can switch from a  $\text{Ca}^{2+}$ -dependent to a  $\text{Ca}^{2+}$ -independent binding mode as a function of the glycans”

10:40 – 11:20 **Coffee Break** *Hotel Restaurant*

**SESSION 4**

**Carbohydrate-nucleic acids interactions; materials**

Chairperson: *Jean-Louis Reymond*, Switzerland

11:20 – 11:40 **Cristina Vicent**, Spain

„Sugar-oligoamides: Chemical tools to study carbohydrate- and glycoprotein-DNA recognition”

11:40 – 12:00 **José M. García Fernández**, Spain

„Glycotargeted gene delivery with cyclodextrins: Making bridges between nucleic acids and lectins”

12:00 – 12:20 **Roland J. Pieters**, The Netherlands

“Potent divalent inhibitors containing rigid spacer units”

12:20 – 12:40 **Matthew I. Gibson**, UK

„Materials for Glycomics and as Glycomimetics”

12:40 – 13:00 **Aloysius Siriwardena**, France

„Carbohydrate modified foldamers as conformationally defined and biologically distinct glycopeptide mimetics”

13:00 – 14:00 **Lunch** *Hotel Restaurant*

14:00 – 15:00 **POSTER SESSION II** (All posters will be displayed)  
coffee and drinks will be served

**SESSION 5**

**Glycomaterials in the medicinal applications**

Chairperson: *Roland Pieters*, The Netherlands

15:00 – 15:20 **Barbara Richichi**, Italy

„Adhesion-targeted therapies in cancer: Modulation of melanoma cells motility and adhesion induced by carbohydrate-based multivalent scaffolds”

15:20 – 15:40 **Daniel J. Williamson**, United Kingdom

„Sortase-mediated modification of carbohydrate binding proteins for drug delivery”

15:40 – 16:00 **Velasco-Torrijos Trinidad**, Ireland

„Facile approach towards synthetic glycolipids: Potential as soft materials and antimicrobial agents”

16:00 – 16:20 **Mikkel B. Thygesen**, Denmark

„New tools for deciphering plant-microbe interactions involving lipochitin oligosaccharides”

16:20 – 16:40 **Francesco Peri**, Italy

„Immunomodulating properties of TLR4-active cationic and anionic

amphiphiles”

16:40 – 17:00 **Coffee Break** *Congress Hall Foyer*

### **SESSION 6**

#### **Carbohydrate structures and multivalency**

Chairperson: *Cristina Nativi*, Italy

17:00 – 17:20 **Martina Lahmann, Stefan Oscarson**, UK; Ireland

„Synthesis of Lewis b-containing glycoconjugates for investigations of *Helicobacter pylori* binding to human glycan receptor structures”

17:20 – 17:40 **Stéphane P. Vincent**, Belgium

“Glycofullerenes as antiadhesive molecules and glycosyltransferase inhibitors”

17:40 – 18:00 **Yelena Wainman**, United Kingdom

„Imaging cell surface glycosylation *in vivo* using bioorthogonal ‘double-click’ chemistry”

18:00 – 18:30 **Seunghwan Lee**, Denmark

„Bovine submaxillary mucin (BSM) films: Interaction with lectins and unique non-fouling properties”

20:00

**Social Dinner:** Restaurant Senses, Hotel Prague Castle Lindner,  
[http://www.lindner.de/en/hotel\\_prague\\_castle/](http://www.lindner.de/en/hotel_prague_castle/) (ca 10 min walk, 550 m)

## **Sunday, 21<sup>st</sup> April**

### **Programme**

*Conference Room III*

### **SESSION 7**

#### **Carbohydrates and multivalency**

Chairperson: *Olivier Renaudet*, France

09:00 – 09:20 **Francesco Sansone**, Italy

„Incorporation of a calixarene-based glucose functionalised bolaamphiphile in lipid bilayers for multivalent lectin recognition”

09:20 – 09:40 **Andrea Koerdt**, Austria

„Impact of the S-Layer and its glycosylation status on the attachment to a surface and the subsequent biofilm formation of *Tannerella forsythia*”

09:40 – 10:00 **Miguel Machuqueiro**, Portugal

„pH dependent conformational study of a synthetic receptor for molecular recognition of carbohydrates”

10:00 – 11:00 **Management Committee Meeting**

11:00 – 12:00 **Meeting of the Working groups**

13:00

**Departure**

**Poster Presentations at the Workshop of the ESF COST project MultiGlycoNano  
CM1102**

*Hotel Pyramida Prague, Conference Room III*

**1. Palmioli Alessandro**, Italy

„Selective targeting of C-type Lectin receptors with multivalent glycomimetic antagonists”

**2. Vojtěch Spiwok**, Czech Republic

„Prediction of puckering equilibria in pyranose sugars using metadynamics”

**3. Rocio Risquez-Cuadro**, Spain

„Multivalent sp<sup>2</sup>-iminosugars as glycosidase inhibitors and lectin ligands”

**4. Olivier Renaudet**, France

„Extending the scope of oxime ligation: synthesis of large cyclopeptide-based glycodendrimers and binding assays with lectins”

**5. Juraj Kona**, Slovakia

„How to improve predictive accuracy of a QSAR model for the design of inhibitors of sugar processing enzymes with transition metal ion co-factors”

**6. Barbara La Ferla**, Italy

„Glycomimetics conjugated nanoparticles: tools and diagnostic-therapeutic agents”

**7. Dirk Heyl**, Germany

„Glyco-conjugated acetylenedicarboxamides: promising tools for glyco-decoration of nanocubes and other scaffolds”

**8. Alberto Maria Marzaioli**, Italy

„Preparation of glycoconjugates having oligosaccharide moiety from bacterial source”

**9. Luis Filipe**, Portugal

„Peptide dendrimers conformational determinants: insights from molecular dynamics simulations”

**10. Oscar Francesconi**, Italy

„Molecular recognition of carbohydrates: a comparison of binding efficacy between pyrrole and pyridine as H-bonding groups for saccharidic hydroxyls”

**11. Shane O'Sullivan**, Ireland

„Towards the synthesis of glycoclusters based on  $\alpha$ -GlcNAc as anti-infective agents”

**12. Sophia Böcker**, Germany

„Fluorescent SNAP-tag galectin-3 fusion protein as a novel tool in glycobiology”

**13. Jani Rahkila**, Finland

„Immunostimulatory oligovalent  $\beta$ -(1 $\rightarrow$ 2)-mannosides: Synthetic studies on the linker length”

**14. Gaëlle Michaud**, Switzerland

„Synthesis of fluorescently labeled peptides to study the mechanism of a bacterial oligosaccharyltransferase”

**15. Myriam Bergmann**, Switzerland

„Multivalent glycopeptide dendrimers as potent inhibitors of *Pseudomonas aeruginosa* biofilms”

**16. J. Garcia Hartjes**, The Netherlands

„Getting One-on-One with cholera toxin: Pentavalent ganglioside calixarenes”

**17. Bastian Lange**, Germany

„En route to keratan sulfate like glycan structures: Characterization of novel 6-O-sulfated GlcNAc analogues as acceptors for human  $\beta$ 1,4-galactosyltransferase-I”

**18. Ruben R. Rosencrantz**, Germany

“Controlling multivalent glycan presentation - Immobilized glycoconjugate brushes on silica surfaces”

**19. Chung-Yi Wu**, Taiwan

„Carbohydrate-based vaccines for breast cancer”

**20. Kim Seonghun**, Korea

„Development of an engineered *Saccharomyces cerevisiae* strain for production of a Man9GlcNAc2 glycan and glycosylated fluorescent protein substrates for glycosidase and glycosyltransferase activity assays”

**21. Orla McCabe**, Ireland

„Investigations into the binding specificity of a fucose-recognising *Aspergillus* lectin”

**22. Mark Long**, UK

“Synthesis of  $^{13}\text{C}$  labelled lewis b hexasaccharides for NMR-binding studies”

**23. Liam M. Nelligan**, UK

“Synthesis of human milk oligosaccharides for NMR studies”

**24. Guillermo Orts-Gil**, Germany

“Sweet Nano: nanoparticle-carbohydrate conjugates for the elucidation of sugar mediated biological interactions”

**25. Gerben Visser (NL) & L. B. Thomsen (DK)**

“Uptake and transport of superparamagnetic iron oxide nanoparticles through human brain capillary endothelial cells”

**26. Karel Křenek**, Czech Republic

“Reevaluation of binding properties of recombinant lymphocyte receptors NKR-P1A and CD69 to saccharides and peptide ligand”