

COST Action CA18103 INNOGLY: INNOVation with GLYcans - new frontiers from synthesis to new biological targets.

WG2 Report

According to Deliverable 3 in the INNOGLY MoU, activities related to Working Group 2 (WG2) during months 12 and 24 are listed below. During the COVID restrictions (starting February 2020 until today), we have focused on dissemination of glycoscience-related research topics. Citations on the specific Objectives (Obj) and Tasks of INNOGLY Action and WG2 are indicated.

During these two years Objectives and Tasks of WG2 have been addressed by publications, writing of co-authored papers, organization of a virtual minisymposium (to be held in June 2021), and dissemination activities as described below. For the grant period 2, WG2 had plans to organize a workshop and a training school on lysosomal storage diseases in Izmir, Turkey. However, due to the COVID-19 pandemic, these plans could not be carried out.

Month 12 (April 2019-April 2020)

1) M 3.1 WG2: Workshop related to the topics of WG2.

- *INNOGLY Obj1*: Develop a collaborative effort to achieve a common ground on the topics 1) Glycan profiling in health and disease, and 2) Glycan-based diagnostics and therapeutics, as well as the related subtopics.
- *INNOGLY Obj 3*: Foster progress in existing research projects.
- *INNOGLY Obj 10*: Bridge the gap between scientific communities with complementary knowledge and common interests in glycan-related topics.
- *INNOGLY Obj 15*: Enhance public communication to boost promotion of glycoscience within the mainstream of biological sciences.

INNOGLY COST Action 1st meeting, October 24, 2019. “Aula Magna”, Faculty of Mathematics, University of Santiago de Compostela. Rúa Lope Gómez de Marzoa, s/n. Campus sur, 15782, Santiago de Compostela, Spain.

WG2 presentations during the INNOGLY meeting:

1. *Andrea Danani*: Molecular modeling as virtual microscope to investigate molecular mechanisms: some applications with biological systems
2. *Winfried Römer, Annette Brande, Alessia Landi, and Anne Imberty*: Bacterial lectins as master manipulators of host physiology
3. *Fulvio Reggiori*: Autophagy, from fundamental to apply research
4. *Barbara La Ferla, Laura Cipolla*: Nano-Glycotools: from glycomimetics as enzymatic modulators to glycan decorated nanomaterials

5. *Bassam Janji*: Role of autophagy in regulating the anti-tumor immune response
6. *Eeva-Liisa Eskelinen*: Autophagy: from membrane dynamics to regulation by small GTPases
7. *Črtomir Podlipnik*: Reverse docking: a tool to find a target for the ligand
8. *Hans-Joachim Gabius*: The Sugar Code: From Concept to Functional Pairing of Tissue Lectins with Glycoconjugate Counterreceptors
9. *Sabine L. Flitsch*, University of Manchester: Plenary Lecture: Is There a Need for European Glyco-Initiatives

WG2 leader Eeva-Liisa Eskelinen also presented a summary of WG2 activities that were proposed during the INNOGLY kick-off meeting in Brussels:

1. Identify experts (academia and companies)
2. Short research visits (helps also in identifying experts)
3. Workshops (WG2 meetings: science of glycan and autophagy)
4. Writing a review
5. Plan how WG2 can make impact (concrete actions: dissemination, WG meetings, workshops)
6. Seek synergies and collaborations with other WGs

WG2 Objectives and Tasks were also summarized by the WG2 leader:

Objectives

Promote the investigation of the role of glycans in the modulation of autophagy in

- cancer
- lysosomal disorders
- neurodegenerative diseases

Tasks

- Employ advanced techniques to track the glycosylation pattern of glycoconjugates associated to autophagy.
- Promote the identification of relevant model systems to investigate the glycan dependent modulation of autophagy.
- Boost the development of autophagy modulators (nanometric, small molecules and glycoconjugates).

WG2 member suggested to add **lysosomal storage diseases** to the Objectives and Tasks of WG2. There was a wide agreement on this suggestion.

The Santiago de Compostela event was announced on the INNOGLY website and on twitter:

<https://innogly.eu/first-innogly-symposium>

<https://twitter.com/InnoglyA/status/1187667107229634560>

<https://twitter.com/InnoglyA/status/1187347634094247937>

2) Publications from WG2 members (April 2019- April 2020)

1. Landi A, Mari M, Kleiser S, Wolf T, Gretzmeier C, Wilhelm I, Kiritsi D, Thünauer R, Geiger R, Nyström A, Reggiori F, Claudinon J, Römer W. Pseudomonas aeruginosa lectin LecB impairs keratinocyte fitness by abrogating growth factor signalling. *Life Sci Alliance*. 2019 Nov 15;2(6):e201900422. doi: 10.26508/lsa.201900422. Print 2019 Dec. PMID: 31732693
Press release by Windfried Römer and Fulvio Reggiori: 'Bacterial Protein Impairs Important Cellular Processes'
2. Chiricozzi E, Mauri L, Lunghi G, Di Biase E, Fazzari M, Maggioni M, Valsecchi M, Prioni S, Loberto N, Pomè DY, Ciampa MG, Fato P, Verlengia G, Cattaneo S, Assini R, Wu G, Alselehdar S, Ledeen RW, Sonnino S. Parkinson's disease recovery by GM1 oligosaccharide treatment in the B4galnt1^{+/-} mouse model. *Sci Rep*. 2019 Dec 18;9(1):19330. doi: 10.1038/s41598-019-55885-2.
3. Chiricozzi E, Maggioni M, di Biase E, Lunghi G, Fazzari M, Loberto N, Elisa M, Scalvini FG, Tedeschi G, Sonnino S. The Neuroprotective Role of the GM1 Oligosaccharide, II³Neu5Ac-Gg₄, in Neuroblastoma Cells. *Mol Neurobiol*. 2019 Oct;56(10):6673-6702. doi: 10.1007/s12035-019-1556-8.
4. Chiricozzi E, Biase ED, Maggioni M, Lunghi G, Fazzari M, Pomè DY, Casellato R, Loberto N, Mauri L, Sonnino S. GM1 promotes TrkA-mediated neuroblastoma cell differentiation by occupying a plasma membrane domain different from TrkA. *J Neurochem* 2019 Apr;149(2):231-241. doi: 10.1111/jnc.14685.
5. Paul A, Li WH, Viswanathan GK, Arad E, Mohapatra S, Li G, Jelinek R, Gazit E, Li YM, Segal D. Tryptophan-glucosamine conjugates modulate tau-derived PHF6 aggregation at low concentrations. *Chem Commun (Camb)*. 2019 Dec 3;55(97):14621-14624. doi: 10.1039/c9cc06868f.
6. García Caballero G, Beckwith D, Shilova NV, Gabba A, Kutzner TJ, Ludwig AK, Manning JC, Kaltner H, Sinowatz F, Cudic M, Bovin NV, Murphy PV, Gabius HJ. Influence of protein (human galectin-3) design on aspects of lectin activity. *Histochem Cell Biol*. 2020 Aug;154(2):135-153. doi: 10.1007/s00418-020-01859-9.
7. Eckardt V, Miller MC, Blanchet X, Duan R, Leberzammer J, Duchene J, Soehnlein O, Megens RT, Ludwig AK, Dregni A, Faussner A, Wichapong K, Ippel H, Dijkgraaf I, Kaltner H, Döring Y, Bidzhekov K, Hackeng TM, Weber C, Gabius HJ, von Hundelshausen P, Mayo KH. Chemokines and galectins form heterodimers to modulate inflammation. *EMBO Rep*. 2020 Apr 3;21(4):e47852. doi: 10.15252/embr.201947852.
8. García Caballero G, Kaltner H, Kutzner TJ, Ludwig AK, Manning JC, Schmidt S, Sinowatz F, Gabius HJ. How galectins have become multifunctional proteins. *Histol Histopathol*. 2020 Jun;35(6):509-539. doi: 10.14670/HH-18-199. Epub 2020 Jan 10. PMID: 31922250
9. García Caballero G, Schmidt S, Manning JC, Michalak M, Schlötzer-Schrehardt U, Ludwig AK, Kaltner H, Sinowatz F, Schnölzer M, Kopitz J, Gabius HJ. Chicken lens development: complete signature of expression of galectins during embryogenesis and evidence for their complex formation with α -, β -, δ -, and τ -crystallins, N-CAM, and N-cadherin obtained by affinity chromatography. *Cell Tissue Res*. 2020 Jan;379(1):13-35. doi: 10.1007/s00441-019-03129-0
10. Kutzner TJ, Higuero AM, Süßmair M, Kopitz J, Hingar M, Díez-Revuelta N, Caballero GG, Kaltner H, Lindner I, Abad-Rodríguez J, Reusch D, Gabius HJ. How presence of a signal peptide affects human galectins-1 and -4: Clues to explain common absence of a leader sequence among adhesion/growth-regulatory galectins. *Biochim Biophys Acta Gen Subj*. 2020 Jan;1864(1):129449. doi: 10.1016/j.bbagen.2019.129449.

11. de Jong CGHM, Gabius HJ, Baron W. .The emerging role of galectins in (re)myelination and its potential for developing new approaches to treat multiple sclerosis. *Cell Mol Life Sci.* 2020 Apr;77(7):1289-1317. doi: 10.1007/s00018-019-03327-7.
12. Kaltner H, Abad-Rodríguez J, Corfield AP, Kopitz J, Gabius HJ. The sugar code: letters and vocabulary, writers, editors and readers and biosignificance of functional glycan-lectin pairing. *Biochem J.* 2019 Sep 24;476(18):2623-2655. doi: 10.1042/BCJ20170853.
13. Kutzner TJ, Gabba A, FitzGerald FG, Shilova NV, García Caballero G, Ludwig AK, Manning JC, Knospe C, Kaltner H, Sinowatz F, Murphy PV, Cudic M, Bovin NV, Gabius HJ. How altering the modular architecture affects aspects of lectin activity: case study on human galectin-1. *Glycobiology.* 2019 Jul 19;29(8):593-607. doi: 10.1093/glycob/cwz034.
14. Kaltner H, Gabius HJ. Sensing Glycans as Biochemical Messages by Tissue Lectins: The Sugar Code at Work in Vascular Biology. *Thromb Haemost.* 2019 Apr;119(4):517-533. doi: 10.1055/s-0038-1676968.
15. Ludwig AK, Kaltner H, Kopitz J, Gabius HJ. Lectinology 4.0: Altering modular (ga)lectin display for functional analysis and biomedical applications. *Biochim Biophys Acta Gen Subj.* 2019 May;1863(5):935-940. doi: 10.1016/j.bbagen.2019.03.005
16. Athanasios Papakyriakou, Francesca Cencetti , Elisa Puliti , Laura Morelli , Jacopo Tricomi , Paola Bruni , Federica Compostella , Barbara Richichi . Glycans Meet Sphingolipids: Structure-Based Design of Glycan Containing Analogues of a Sphingosine Kinase Inhibitor. *ACS Med Chem Lett* 2020 Mar 30;11(5):913-920. doi: 10.1021/acsmchemlett.9b00665.
17. Ramos-Soriano J, Reina JJ, Illescas BM, de la Cruz N, Rodríguez-Pérez L, Lasala F, Rojo J, Delgado R, Martín N. Synthesis of Highly Efficient Multivalent Disaccharide/[60]Fullerene Nanoballs for Emergent Viruses. *J Am Chem Soc.* 2019 Sep 25;141(38):15403-15412. doi: 10.1021/jacs.9b08003.
18. Gallego I, Rioboo A, Reina JJ, Díaz B, Canales Á, Cañada FJ, Guerra-Varela J, Sánchez L, Montenegro J. Glycosylated Cell-Penetrating Peptides (GCPPs). *Chembiochem.* 2019 Jun 3;20(11):1400-1409. doi: 10.1002/cbic.201800720.

The publications above cover the following INNOGLY Objectives:

- Obj 1: Develop a collaborative effort to achieve a common ground on the topics, 1) Glycan profiling in health and disease, and 2) Glycan-based diagnostics and therapeutics, as well as the related subtopics
- Obj 2: Develop glycan-based tools (nanometric and small molecules) to track glycosylation pathways and to dissect immunomodulatory functions.
- Obj 3: Foster progress in existing research projects.
- Obj 4: Develop biosensors to investigate glycan-protein interactions.
- Obj 10: Bridge the gap between scientific communities with complementary knowledge and common interests in glycan-related topics.
- Obj 15: Enhance public communication to boost promotion of glycoscience within the mainstream of biological sciences.

The publications above cover the topics related to WG2 Objectives/Task:

Objectives

Promote the investigation of the role of glycans in the modulation of autophagy and the lysosomal system in neurodegenerative diseases

Tasks

Employ advanced techniques to track the glycosylation pattern of glycoconjugates associated to autophagy and the lysosomal system.

Month 24 (May 2020- May 2021)

1) Workshop related to the topics of WG2

WG2 is organizing a virtual Minisymposium (June 21st, 2021, Zoom platform). Below the detailed program of the meeting:

INNOGLY WG2 minisymposium

June 21, 3 pm – 5 pm Central European Time

Keynote at 3 pm CET

David Sleat, Associate Professor, Center of Advanced Biotechnology and Medicine, Rutgers University, New Jersey, USA

Lysosomal proteomics and human disease

Talks by INNOGLY members, 4 – 5 pm CET:

Massimo Aureli, University of Milan, Italy:

Involvement of lysosomal impairment in the onset of neuronal damage

Ole Kristian Greiner Tollersrud, Arctic University of Norway, Tromsø:

Trimming of N-glycans in the lysosomes: A novel processing pathway

Mattan Hurevich and Shlomo Yitzchaik, The Hebrew University of Jerusalem, Israel:

Studying glycan interactions using electrochemical impedance spectroscopy

This event is announced on the INNOGLY website and Twitter:

webpage: <https://innogly.eu/innogly-wg2-minisymposium-autophagy>

Twitter: <https://twitter.com/InnoglyA/status/1400023925866864640>

2) Sandro Sonnino is the Guest Editor for the special issue of Glycoconjugate Journal on **Gangliosides and Parkinson's disease**. In preparation.

3) Writing a review on the roles of glycan in the lysosomal system and autophagy

Five WG2 members with interdisciplinary expertise joined their efforts and wrote a review:

Fulvio Reggiori, Hans-Joachim Gabius, Massimo Aureli, Winfried Römer, Sandro Sonnino, Eeva-Liisa Eskelinen: **Glycans in autophagy, endocytosis and lysosomal functions**

The manuscript was submitted to Glycoconjugate journal on May 10th, 2021. Minor comments arrived June 2nd, and the manuscript is currently under revision.

The activities above cover the following INNOGLY Objectives:

- Obj 1: Develop a collaborative effort to achieve a common ground on the topics 1) Glycan profiling in health and disease, and 2) Glycan-based diagnostics and therapeutics, as well as the related subtopics.
- Obj 4: Develop biosensors to investigate glycan-protein interactions.
- Obj 10: Bridge the gap between scientific communities with complementary knowledge and common interests in glycan-related topics.
- Obj 12: Help early career researchers to access and build new networks.
- Obj 15: Enhance public communication to boost promotion of glycoscience within the mainstream of biological sciences.

The activities above cover the topics related to WG2 Objectives/Task:

Objectives

Promote the investigation of the role of glycans in the modulation of autophagy and the lysosomal system in lysosomal disorders and neurodegenerative diseases

Tasks

Employ advanced techniques to track the glycosylation pattern of glycoconjugates associated to autophagy and the lysosomal system.

4) Publications of WG2 members (May 2020- May 2021):

1. Chiricozzi E, Aureli M, Mauri L, Di Biase E, Lunghi L, Fazzari M, Valsecchi M, Carsana EV, Loberto N, Prinetti A and Sonnino S (2021) Glycosphingolipids. *Advances in Experimental Medicine and Biology*, accepted
2. Mauri L, Chiricozzi E, Prinetti A and Sonnino S (2021). The structure of glycosphingolipid oligosaccharides hides a specific code for protein recognition. *In Glycome: The Hidden Code in Biology*, ed by D. Banerjee, Nova Publishers, accepted
3. Lunghi G, Fazzari M, Di Biase E, Mauri L, Chiricozzi E, Sonnino S. (2021) The structure of gangliosides hides a code for determining neuronal functions. *FEBS Open Bio*. In press, doi: 10.1002/2211-5463.13197.
4. Bertani V, Prioni S, Di Lecce R, Gazza F, Ragionieri L, Merialdi G, Bonilauri P, Jagannathan V, Grassi S, Cabitta L, A, Morrone A, Sonnino S, Drögemüller C, Cantoni C (2021) A pathogenic *HEXA* missense variant in wild boars with Tay-Sachs disease, *Molecular Genetics and Metabolism*, in press, <https://doi.org/10.1016/j.ymgme.2021.05.001>
5. Chiricozzi E, Di Biase E, Lunghi G, Fazzari M, Loberto N, Aureli M, Mauri L and Sonnino S (2021) Turning the spotlight on the oligosaccharide chain of GM1 ganglioside. *Glycoconjugate Journal*, in press doi: 10.1007/s10719-021-09974-y

6. Grassi, S., Giussani, P., Mauri, L., Prioni S, Sonnino, S., Prinetti, A. (2020) Lipid rafts and neurodegeneration: Structural and functional roles in physiologic aging and neurodegenerative diseases. *Journal of Lipid Research*, 2020, 61, 636–654
7. Lunghi G, Fazzari M, Di Biase E, Mauri L, Sonnino S and Chiricozzi E (2020) Modulation of calcium signaling depends on the oligosaccharide of GM1 in Neuro2a mouse neuroblastoma cells. *Glycoconjugate Journal*, 37:713-727.
8. Di Biase E, Lunghi G, Maggioni M, Fazzari M, Pomè DY, Loberto L, Ciampa MG, Fato P, Mauri L, Sevin E, Gosselet F, Sonnino S, Chiricozzi E (2020) GM1 Oligosaccharide Crosses the Human Blood-Brain Barrier In Vitro by a Paracellular Route. *Int J Mol Sci*, 21:2858. doi: 10.3390/ijms21082858.
9. Loberto N, Mancini G, Bassi R,, Carsana EV, Tamanini A, Pedemonte N, Dehecchi MC , Sonnino S , Aureli M (2020) Sphingolipids and plasma membrane hydrolases in human primary bronchial cells during differentiation and their altered patterns in cystic fibrosis *Glycoconjugate J*, doi: 10.1007/s10719-020-09935-x.
10. Adamo R and Sonnino S (2020) Impact of glycoscience in fighting Covid-19. *Glycoconjugate J*, 37:511-512. doi: 10.1007/s10719-020-09929-9.
11. Mancini G, Loberto N, Olioso D, Dehecchi MC, Cabrini G, Mauri L, Bassi R, Schiumarini D , Chiricozzi E, Lippi G, Pesce E, Sonnino S Pedemonte N, Tamanini A, Aureli M, (2020). GM1 as Adjuvant of Innovative Therapies for Cystic Fibrosis Disease. *Int J Mol Sci*, 21:4486. doi: 10.3390/ijms21124486.
12. Kanoh H, Nitta T, Go S, Inamori K-i, Veillon L, Nihei W, Fujii M, Kabayama K, Shimoyama A, Fukase K, Ohto U, Shimizu T, Watanabe T, Shindo H, Aoki S, Sato K, Nagasaki M, Yatomi Y, Komura N, Ando H, Ishida H, Kiso M, Natori Y, Yoshimura Y, Zonca A, Cattaneo A, Letizia M, Ciampa M, Mauri L, Prinetti A, Sonnino S, Suzuki A, and Inokuchi J-i. (2020) Homeostatic and pathogenic roles of GM3 ganglioside molecular species in TLR4 signaling in obesity. *Embo Journal* 39(12):e101732
13. Fazzari M., Audano m, Lunghi G, Di Biase E, Loberto N, Mitro N, Sonnino S, and Chiricozzi E (2020) The oligosaccharide portion of ganglioside GM1 regulates mitochondrial function in neuroblastoma cells. *Glycoconjugate J*, 7:293-306 DOI : 10.1007/s10719-020-09920-4
14. Di Biase E, Lunghi G, Fazzari M, Maggioni M, Pomè DY, Valsecchi M, Samarani M, Fato P, Ciampa MG, Prioni S, Mauri L, Sonnino S and Chiricozzi E (2020) Gangliosides in the differentiation process of primary neurons: the specific role of GM1-oligosaccharide." , *Glycoconjugate J*. 37:329-343 doi.org/10.1007/s10719-020-09919-x
15. Chiricozzi E, Lunghi G, Di Biase E, Fazzari M, Sonnino S and Mauri L (2020) GM1 ganglioside is a key factor in maintaining the mammalian neuronal functions avoiding neurodegeneration. *Int J Mol Sci*, 21, 868 doi 10.3390/ijms21030868
16. Anderluh M, Berti F, Bzducha-Wróbel A, Chiodo F, Colombo C, Compostella F, Durlík K, Ferhati X, Holmdahl R, Jovanovic D, Kaca W, Lay L, Marinovic-Cincovic M, Marradi M, Ozil M, Polito L, Reina JJ, Reis CA, Sackstein R, Silipo A, Švajger U, Vaněk O, Yamamoto F, Richichi B, van Vliet SJ. Recent advances on smart glycoconjugate vaccines in infections and cancer. *FEBS J*. 2021 May 2. doi: 10.1111/febs.15909.
17. de la Cruz N , Ramos-Soriano J , Reina JJ , de Paz JL , Thépaut M , Fieschi F , Sousa-Herves A , Rojo J . Influence of the reducing-end anomeric configuration of the Man₉ epitope on DC-SIGN recognition. *Org Biomol Chem*. 2020 Aug 21;18(31):6086-6094. doi: 10.1039/d0ob01380c.

18. La Ferla B, D'Orazio G. Pyranoid Spirosugars as Enzyme Inhibitors. *Curr Org Synth*. 2020 Sep 24. doi: 10.2174/1570179417666200924152648.
19. Berdiaki A, Neagu M, Giatagana EM, Kuskov A, Tsatsakis AM, Tzanakakis GN, Nikitovic D. Glycosaminoglycans: Carriers and Targets for Tailored Anti-Cancer Therapy. *Biomolecules*. 2021 Mar 8;11(3):395. doi: 10.3390/biom11030395
20. Tzanakakis G, Giatagana EM, Kuskov A, Berdiaki A, Tsatsakis AM, Neagu M, Nikitovic D. Proteoglycans in the Pathogenesis of Hormone-Dependent Cancers: Mediators and Effectors. *Cancers (Basel)*. 2020 Aug 24;12(9):2401. doi: 10.3390/cancers12092401.
21. Papoutsidakis A, Giatagana EM, Berdiaki A, Spyridaki I, Spandidos DA, Tsatsakis A, Tzanakakis GN, Nikitovic D. Lumican mediates HTB94 chondrosarcoma cell growth via an IGF-IR/Erk1/2 axis. *Int J Oncol*. 2020 Sep;57(3):791-803. doi: 10.3892/ijo.2020.5094.
22. Kociurzynski, R., Makshakova, O., Knecht, V., Winfried Römer, W. Multiscale Molecular Dynamics Studies Reveal Different Modes of Receptor Clustering by Gb3-Binding Lectins. *J Chem Theory Comput*. 2021 Apr 13;17(4):2488-2501. doi: 10.1021/acs.jctc.0c01145.
- 5) Application to the Seed 4 Innovation Scouting of the University of Milan with the project 'Use of oligosaccharide for the therapy of Parkinson's disease' by Sandro Sonnino and Laura Mauri (the application passed the first two selections, decision on May 28th)

The publications and grant proposal above cover the following INNOGLY Objectives:

- Obj 1: Develop a collaborative effort to achieve a common ground on the topics 1) Glycan profiling in health and disease, and 2) Glycan-based diagnostics and therapeutics, as well as the related subtopics.
- Obj 3: Foster progress in existing research projects.
- Obj 4: Develop biosensors to investigate glycan-protein interactions.
- Obj 5: Promote the synthesis of glycomimetics and glycan-based analogues of specific target epitopes.
- Obj 10: Bridge the gap between scientific communities with complementary knowledge and common interests in glycan-related topics.
- Obj 15: Enhance public communication to boost promotion of glycoscience within the mainstream of biological sciences.

The publications above cover the topics related to WG2 Objectives/Task:

Objectives

Promote the investigation of the role of glycans in the modulation of autophagy/lysosomal system in lysosomal disorders, neurodegenerative diseases, and cancer.

Tasks

Promote the identification of relevant model systems to investigate the glycan dependent modulation of autophagy and the lysosomal system.

5) Upcoming events

5.1. WG2 will have a virtual meeting, organized using the Zoom platform, on June 21, 2021 (program on page 5). This meeting accommodates one keynote invited talk by David Sleat, and three talks from the INNOGLY WG2, including early career investigators.

5.2. INNOGLY is promoting STSMs by announcing a list of laboratories that are able to host research visits. The following WG2 members are on the list:

Group Leader	Institution/Country	Available to host STSM (yes/no)	STSM in presence (yes/no)	Subject of the STSM project	Virtual STSM (yes/no)	Subject of the virtual STSM project
Eeva-Liisa Eskelinen	University of Turku, Institute of Biomedicine, Finland	yes	yes*	Electron microscopy	yes	Interpretation of EM images
Fulvio Reggiori	University of Groningen, University Medical Center Groningen, Department of Biomedical Sciences of Cells and Systems, Groningen, The Netherlands	yes	yes*	Autophagy measurements	no	N.A.
Barbara La Ferla	University of Milano-Bicocca, Dept Biotechnology, Italy	yes	yes	Synthesis of glycomimetics	no	N.A.
Sandro Sonnino	University of Milan Dept. Medical Biotechnology and Translational Medicine, Italy	yes	yes	Oligosaccharides and neurodegenerative diseases	no	N.A.
Raz Jelinek	Ben Gurion University, Israel	yes	yes*	Oligosaccharides and bacteria	no	N.A.
Ole K Greiner-Tollersrud	Arctic University of Tromsø, Health Faculty, Norway	yes	yes*	Purification and glycan analyses of lysosomal proteins	no	N.A.

* Currently not possible because due to COVID-19 restrictions, we cannot host students from abroad; possibly from September onward.

The upcoming events above cover the following INNOGLY Objectives:

- Obj 11: Set up a platform for early career researchers
- Obj 12: Help early career researchers to access and build new networks.
- Obj 10: Bridge the gap between scientific communities with complementary knowledge and common interests in glycan-related topics.

The upcoming events above cover the topics related to WG2 Objectives/Task:

Objectives

Promote the investigation of the role of glycans in the modulation of autophagy and the lysosomal system in lysosomal disorders and neurodegenerative diseases

Tasks

Employ advanced techniques to track the glycosylation pattern of glycoconjugates associated to autophagy and the lysosomal system.

WG2 members

Leader: Eeva-Liisa Eskelinen, Finland

Vice leader: Raz Jelinek, Israel

Current members:

Lejla Begic, BA

Bassam Janji, LU

Adaleta Softic, BA

Winfried Römer, GE

Vladimir Mastihuba, SK

Fulvio Reggiori, NL

Szymon Buda, PL

Jose J. Reina, ES

Giulia Paiardi, IT

Sandro Sonnino, IT

Barbara La Ferla, IT

Sabine Flitsch, UK

Inmaculada Cuchillo Ibáñez, ES

Crtomir Podlipnik, SL

Arzu Celik, TR

Volkan SEYRANTEPE, TR

Barbara Richichi, IT

Andrea Danani, CH

Giatagana Eirini Maria, GR

Hans-Joachim Gabius, GE

Ole Kristian Greiner Tollersrud, NO

Massimo Aureli, IT

Muhammet Köse, TR

Yalçın Özkaç, TR

Róisín O'Flaherty, IR