

**H2020 Marie Skłodowska-Curie
Innovative Training Network
CORE www.coreitn.eu**

**Workshop 2019 / Chirality in
Practice**

Syncom, Groningen, Monday 20 – Friday 24 May 2019

[\[Google map\]](#)



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1 Welcome

About the network

Industries are in need of highly skilled academically trained experts and powerful sets of tools enabling the design, control & prediction of optimized & efficient production process of future high-value products such as chiral pharmaceuticals. The CORE Network will in parallel train 15 ESRs and develop tools, approaches and methods within the area of Continuous Resolution (CORE), the process to obtain enantiopure molecules of chiral compounds.

CORE brings together [8 beneficiaries](#), [6 associate partners](#) and [2 external experts](#) across [7 European countries](#) resulting in an unparalleled combination of chirality, synthesis and crystallization training and research covering the areas of Chemical Engineering, Chemistry and Applied Physics.

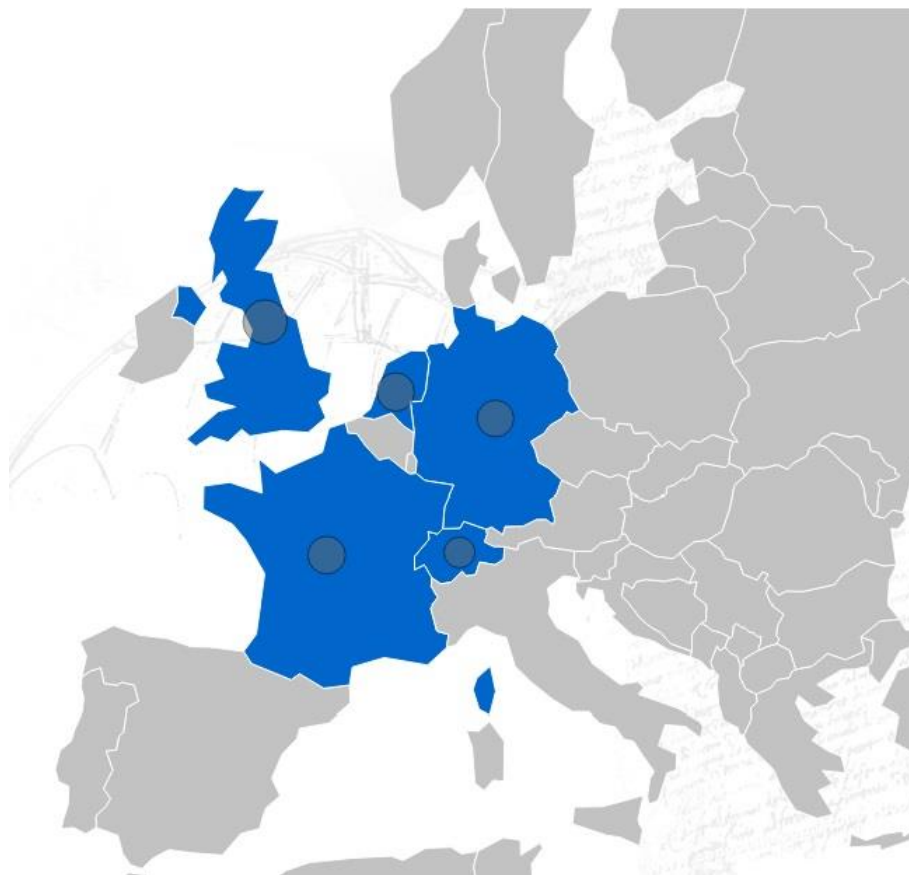


Figure 1: Beneficiary partner countries

This booklet will give you an overview of the CORE training network, and the third CORE workshop event being hosted by Beneficiary partner, Syncom, and provide an overview on helpful practical information for the organisation of your stay in Groningen.

2 Overview of the training programme

This event will be the seventh of ten network wide events, which are the main meeting events of our Innovative Training Network. Before getting into programme details it might be helpful to give you a brief reminder of the key elements of the training and research programme.

	Main Training Events & Conferences	EC	Location/Lead	Date	M	Complete
1	Introductory event	2	University of Strathclyde, UK	30 January - 2 February 2017	4	Y
2	Summer School Crystallization	2	Radboud University, Netherlands	3-7 July 2017	8	Y
3	Workshop on Solid State Properties	2	TeraCrystal, Romania	6-10 November 2017	14	Y
4	Summer School Process Analytical Tools	2	University of Manchester, UK	16 - 20 April 2018	19	Y
5	Workshop Resolution Fundamentals and Mid-term Review Meeting	2	University of Rouen, France	3 - 5 September 2018	24	Y
6	Conference Chirality & Resolution (BIWIC 2018 - 25th International Workshop on Industrial Crystallization)		University of Rouen, France	6 -7 September 2018	24	Y
7	Workshop Chirality in Practice	2	Syncom, Groningen, Netherlands	20-24 May 2019	32	
8	IMPRS/CORE Joint Summer School – Particulate Systems: From Theory to Applications	2	OVGU/MPI, Magdeburg, Germany	26 – 30 August 2019	35	
9	Final Workshop*		FAU, Erlangen, Germany	8-11 October 2019	37	
10	ISIC Conference – CORE Session on Chirality & Resolution		USTRATH - ISIC, Potsdam near Berlin, Germany	8 – 11 September 2020	48	

* Additional event for ESRs to present their final work within the network.

Figure 2: Key elements of the training and research programme

The training objective of the CORE network is to deliver a CORE skills toolbox of knowledge, personal, organizational and impact skills to a core of multi-disciplinary scientists and engineers in the interdisciplinary and cross-sectional field of Continuous Resolution. Each ESR obtains dedicated training through their research project, network events, a webinar course, management involvement and an academic & industrial secondment.

Research Work Packages

The research objective of the CORE Network is to jointly construct a CORE Industrial Toolbox on Continuous Resolution that provides next generation tools, approaches and methods to industry for the development continuous resolution processes. The strongly involved industrial partners will ensure that the CORE Industrial Toolbox fulfils their requirements in the skills gap areas Towards Continuous, Hybrid Resolution and Enabling Resolution.

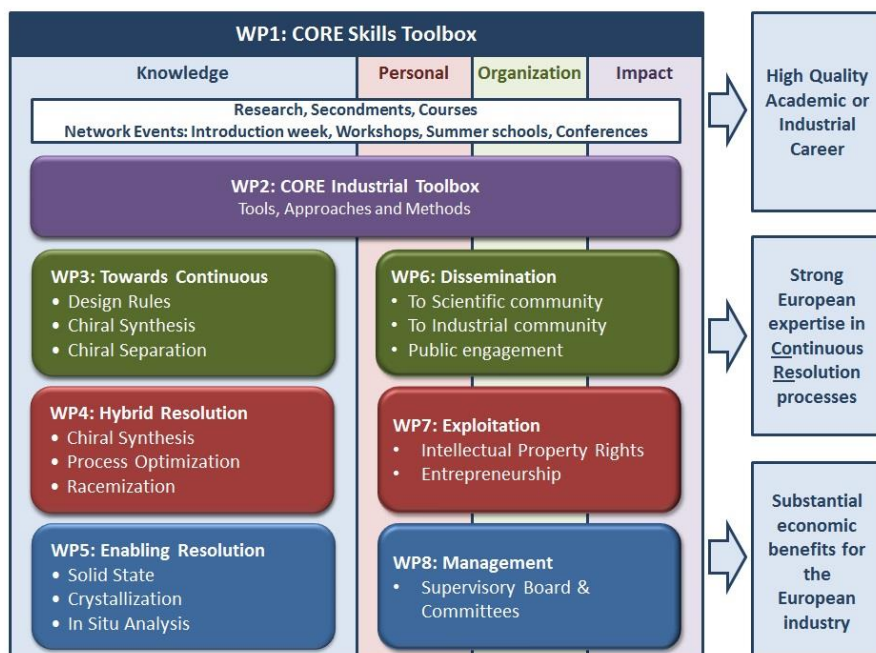


Figure 3: Each ESR will develop, validate and deliver a tool, approach or method within WP3-5 to be integrated in the CORE Industrial Toolbox (WP2), see [Figure 4](#) for the relation between WP and individual ESR projects. Through WP2 the ESRs will be trained to work in an international multidisciplinary team on a joint target where the synergy between the ESRs will be responsible for an intensified training in both knowledge and transferable skills. Expertise areas that will be covered by the network are: Continuous Manufacturing, Chiral Resolution, Chiral Synthesis, Crystallization Fundamentals, Process Analytical Tools and Process Modelling & Design.

ESR Projects

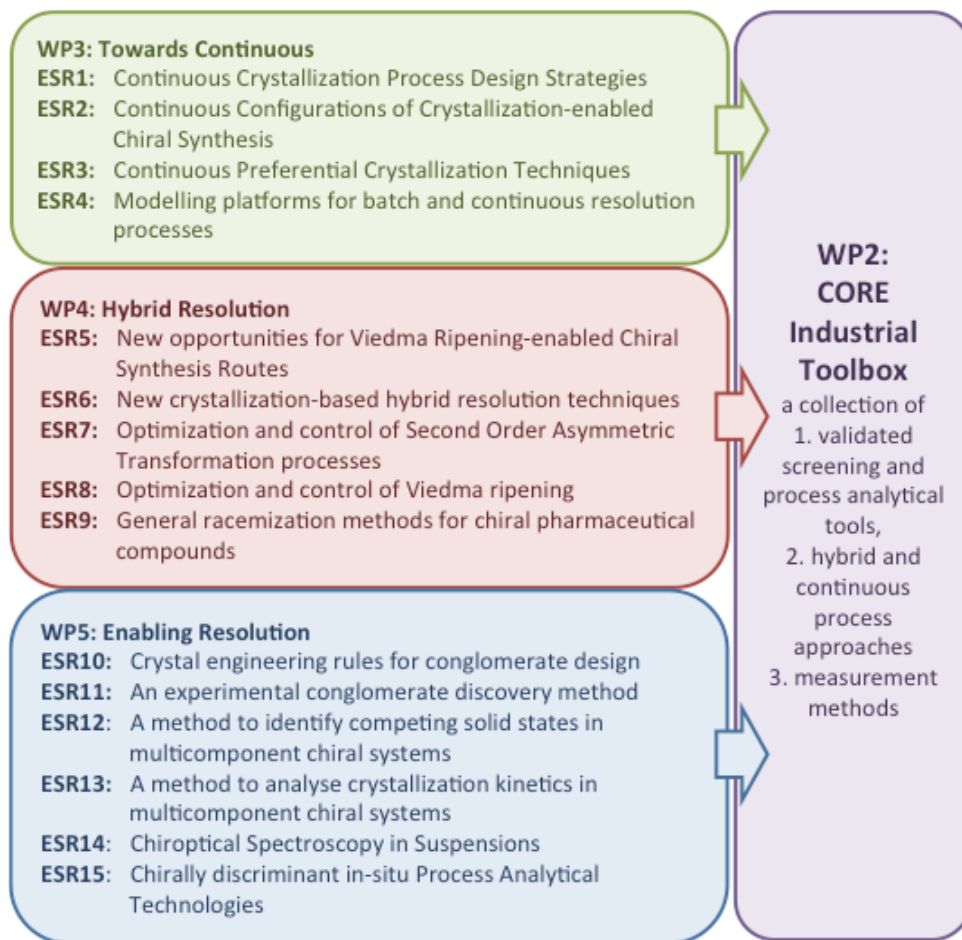


Figure 4: Relationship between WP and individual ESR projects

Management Involvement

Each ESR will be a member of the Training Committee, CORE Industrial Toolbox Committee, Dissemination Committee, Exploitation Committee or the Supervisory Board. In each of these committees 3 ESRs will be positioned. This will help the ESRs to develop management and organization skills while developing detailed strategies on e.g., dissemination.

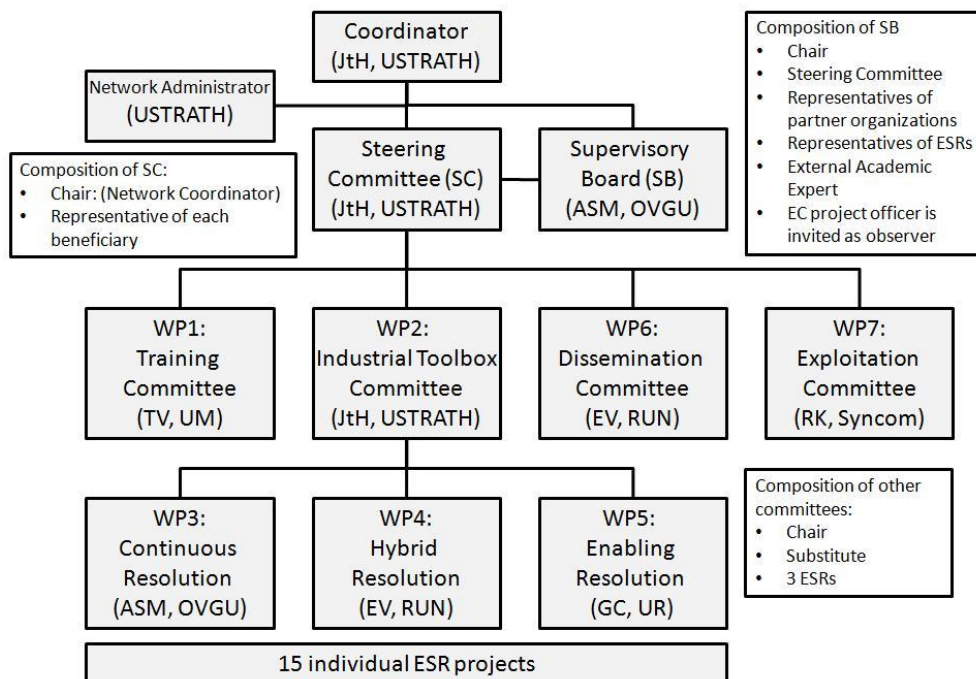


Figure 5: CORE management structure

ESR No	ESR Name	Host
Supervisory Board (Chair: Prof Andreas Andreas Seidel-Morgenstern)		
2	Johannes Hoffmann	USTRATH
8	Francesca Breveglieri	ETH
9	Carola Tortora	UEN
WP1: Training Committee (Chair: Thomas Vetter, Deputy Chair: Prof Joop ter Horst)		
3	Francesca Cascella	OVGU
12	Lina Harfouche	UR
15	Gufhran ur Rehman	UM
WP2: Industrial Toolbox (Chair: Prof Joop ter Horst, Deputy Chair: Prof Andreas Seidel-Morgenstern)		
1	Shashank Bhandari	OVGU
7	Ryusei Oketani	UR
10	Jan Joris Devogelaer	RU
WP6: Dissemination Committee (Chair: Prof Elias Vlieg, Deputy Chair: Prof Svetlana Tsogoeva)		
5	Giuseppe Belletti	RU
11	Aliou Mbodji	UR
14	Raghunath Venkatramanan	USTRATH
WP7: Exploitation Committee (Chair: Prof Richard Kellogg, Deputy Chair: Prof Joop ter Horst)		
4	Brigitta Bodak	ETH
6	Guilio Valenti	Syncom
13	Maxime Charpentier	USTRATH

Figure 6: ESR allocation to CORE committees

Academic & Industrial Secondment

All ESRs visits/secondments are planned at the secondary supervisor institute, at an academic partner as well as at an industrial partner. Additional minor secondments at other academic or industrial partners may be arranged for ESRs to acquire additional specific skills to be added to the CORE Skills Toolbox ([see Gantt Chart](#)).

The ESR define a short research project in cooperation with the primary and secondary supervisor to perform during the secondary supervisor visit. The second supervisor will thus provide complementary expertise and, if beneficial, can also provide access to additional equipment, analysis techniques and transferable skills training.

The academic partners host the **academic secondments**. The ESR in cooperation with the academic secondment supervisor and the primary supervisor define the academic research project to be performed during the 3-5 month academic secondment. The secondment at the academic partner is targeting a specific skill needed to develop the tool, approach or method for the CORE Toolbox. The aim of the visit is to come to a joint scientific paper on the defined project.

The industrial participants host and supervise the **industrial secondments**. The ESR in cooperation with the industrial secondment supervisor and the primary supervisor define the industrial project to be performed during the 3-5 month industrial secondment. The secondment at the industrial partner is targeting the viability of the developed tool, approach or method for the CORE Toolbox.

The Workshop 2019

This CORE workshop, “Chirality in Practice”, 2019 is the third of four CORE workshops which are for the CORE network participants only. Two days, Tuesday 21 and Wednesday 22 May are dedicated to the CORE network activities, and all other days will be dedicated to ESR training.

All Early Stage Researchers (ESRs) are expected to attend, while supervisors, together with representatives of the associate partner organisations, external experts, and the project manager/assistant are invited to attend the workshop to discuss the CORE project.

The full programme is outlined on the following pages.

3 Programme

Workshop Chirality in Practice, 20-24 May 2019

Monday 20 May 2019 – hosted by Syncom

Meetings will take place in the building located at Mudden 12. In the Mudden building, most meetings will be held in the main lecture room (collegezaal) on the ground floor. Most other meetings will be held in other rooms within the Mudden building.

- 08:45-09:00** Welcome Richard Kellogg; Introduction Joop ter Horst
- 09:00-10:00** Dr. Wim L. Noorduin, AMOLF “Physical Chemical Routes to Single Handedness”
- 10:00-11:30** Break and Tour of Laboratory Facilities, Mr. Mark Hamminga, Dr. Michel Leeman and Richard Kellogg
- 11:30-12:30** Dr. Robert Hof, Chief Operating Officer, MercachemSyncom, “MercachemSyncom and Our Role in Drug Discovery”
- 12:30-14:00** Lunch
- 14:00-15:00** Dr. Bernard Kaptein, Innosyn Laboratories, “Chirality in Practice”
- 15:00-15:30** Break
- 15:30-16:15** Richard Kellogg, “Science, Business and the Hard Facts of Life”
- 16:15-17:15** IP/Entrepreneurship Session 1 (Theory)

Return to hotel; everyone free for the evening. Groningen has many restaurants ranging from reasonably priced to expensive.

Tuesday 21 May 2019

- 08:45-09:00** Toolbox Introduction
- 09:00-11:00** CORE Toolbox Presentations WP3 x 4 (20 min plus 5/10min Q&A per person)
- ESR4: Brigitta Bodak, ETH Zurich (Swiss Federal Institute of Technology in Zurich), Switzerland (ETH)
 - ESR3: Francesca Cascella, Otto-von-Guericke University Magdeburg, Germany (OVGU)
 - ESR2: Johannes Hoffmann, University of Strathclyde, Scotland UK (USTRATH)
 - ESR1: Shashank Bhandari, Otto-von-Guericke University Magdeburg, Germany (OVGU)
- 11:00-11:30** Break
- 11:30-12:30** CORE Toolbox Presentations WP4 x 2 (20 min plus 5/10min Q&A per person)
- ESR9: Carola Tortora, Friedrich - Alexander University Erlangen - Nürnberg, Germany (FAU)
 - ESR8: Francesca Breveglieri, ETH Zurich (Swiss Federal Institute of Technology in Zurich), Switzerland (ETH)
- 12:30-14:00** Lunch for ESRs and in parallel Supervisory Board
- 14:00-15:00** Dr. Luc van Hijfte, MercachemSyncom, “A Neglected Compound, for a Neglected Disease: TB or not TB”

- 15:00-16:00** Free time
- 16:00-17:30** Guided Tour of Groningen (Leaving from tourist office at main market place, Grote Markt)
- 18:00** Dinner in Groningen, [Café de Sleutel](#)

Wednesday 22 May 2019

- 09:00-10:30** CORE Toolbox Presentations WP4 x 3 (20 min plus 5/10min Q&A per person)
- ESR7: Ryusei Oketani, University of Rouen, France (UR)
 - ESR6: Giulio Valenti, SYNCOM, The Netherlands
 - ESR5: Giuseppe Belletti, Radboud University Nijmegen, Netherlands (RUN)
- 10:30-11:00** Break
- 11:00-12:30** CORE Toolbox Presentations WP5 x 3 (20 min plus 5/10min Q&A per person)
- ESR15: Ghufuran ur Rehman, University of Manchester, UK (UM)
 - ESR14: Raghunath Venkatramanan, University of Strathclyde, Glasgow, UK (USTRATH)
 - ESR13: Maxime Charpentier, University of Strathclyde, Glasgow, UK (USTRATH)
- 12:30-13:30** Lunch and Networking with Associate Partners and External Experts
- 13:30-15:00** CORE Toolbox Presentations WP5 x 3 (20 min plus 5/10min Q&A per person)
- ESR12: Lina Harfouche, University of Rouen, France (UR)
 - ESR11: Aliou Mbodji, University of Rouen, France (UR)
 - ESR10: Jan-Joris Devogelaer, Radboud University Nijmegen, Netherlands (RUN)
- 15:00-15:30** Break
- 15:30-16:30** Parallel Meetings of CORE Industrial Toolbox (WP3: Towards Continuous w/ Joop ter Horst, WP4: Hybrid Resolution w/ Elias Vlieg and WP5: Enabling Resolution w/ Valérie Dupray)
- Parallel meetings will take place in the following locations:-
- Work Package 3: Office of Ton Vries
 - Work Package 4: Office of Marga Vos
 - Work Package 5: Main lecture room (collegezaal)
- 16:30-17:00** Toolbox Summary and Discussion
- 17:30-18:30** Steering Committee Meeting (Beneficiary partners only)

Thursday 23 May 2019

- 09:00-10:00** Dr. Michel Leeman, MercachemSyncom, "Resolution of Racemates by Crystallization"
- 10:00-10:15** Break
- 10:15-11:15** Dr. H. Meekes, Radboud University, Nijmegen, "Racemization, Deracemization and Isomerization Developments Outside of CORE"
- 11:15-12:15** Dr. Jean-Paul Seerden, Syncom BV, "Billion Dollar Drugs"
- 12:15-13:15** Lunch
- 13:15-14:30** IP/Entrepreneurship Session 2 (Practical)

14:30-14:45 Break

14:45-16:00 IP/Entrepreneurship Session 3 (Short Presentations)

16:00-16:30 Evaluation Session for ESRs with Claire Scott

Friday 24 May 2019

09:00-12:00 Presentation Skills by Artesc, Robin Steegman

12:00-13:00 Lunch

Abstracts and Speaker Biographies

Robert Hof, “MercachemSyncom and Our Role in Drug Discovery”

Abstract

This presentation focuses on drug discovery, and will be about the Contract Research Landscape in drug discovery and the role MercachemSyncom as a CRO plays in this field, with a particular focus on chiral technologies and services.

Biography

Robert carries 25 years of R&D leadership experience in the pharmaceutical service industry. Chiral chemistry has always played an important role throughout Roberts career. Robert obtained his PhD in 1995 at the University of Groningen, The Netherlands, under the supervision of Prof. R.M. Kellogg in the field of asymmetric synthesis and biocatalysis. After his PhD, Robert worked 13 years for the pharmaceutical division of royal DSM where he held managerial responsibilities in the field of process R&D, cGMP manufacturing and innovation management. He has developed dozens of chiral routes to pharmaceutically relevant molecules, many of these patented, and scaled these processes to industrial scale. After working for 2 years for Pepscan Therapeutics, a company active in peptide based therapeutics, Robert joined Syncom in 2010 as Chief Operating Officer where he is responsible for all chemistry and analytical chemistry activities executed within the company. In addition, Robert is member of the managing board of MercachemSyncom.

Bernard Kaptein, “Chirality in Practice”

Abstract

Chiral compounds can be prepared by various chiral technologies. In this presentation, an overview will be given of some of these technologies, ranging from 50% yield concepts, like chiral simulating moving bed chromatography and classical resolution methods, to 100% yield concepts for multi-chiral center compounds by modern asymmetric homogeneous catalytic methods. The various chiral technologies will be illustrated with examples that are applied on industrial scale.

Biography

After receiving his PhD from the University of Groningen, Bernard Kaptein began a career as a scientist in industry. Working at DSM Research in Geleen in the Netherlands, Kaptein started as a Scientist before becoming a Senior Scientist there in 1996. In 2006, he was appointed Senior Scientist at DSM Pharmaceutical Products and moved to DSM Ahead R&D – Innovative Synthesis in 2014. Since 2017, Kaptein has been Senior Scientist at InnoSyn BV, Geleen, where his expertise includes stereochemistry, enzymatic/chemical resolution, asymmetric synthesis, (chiral) crystallization, and amino acid chemistry. He is the recipient of the Unilever Chemistry Prize and previously served on the board of both the Organic Chemistry Section, Royal Dutch Chemical Society, and the Netherlands Organisation for Scientific Research (NWO/CW), study group “Design and Synthesis”.

Richard Kellogg, “Science, Business and the Hard Facts of Life”

Biography

Prof. Richard Kellogg was professor of organic chemistry at the University of Groningen where he was also dean and first director of the Stratingh Institute. He was a co-founder of Syncom and was co-director. He is currently scientific consultant for Syncom and scientific director of a start-up, Philae Pharmaceuticals.

Michel Leeman, “Resolution of Racemates by Crystallization”

Abstract

As chiral drugs can have profoundly different activities and toxicities, it is important for the pharmaceutical industry to have effective and economic means of access to the pure enantiomers. The resolution of racemates is one of the routes towards enantiopure compounds. The most used method for resolving racemates is by classical resolution. Many factors can influence the crystallization of the diastereomeric salts and understanding the system will help to explain odd results and aid in designing a resolution that is suitable for scaling to multi-kilogram scale.

Biography

After receiving his BSc from the University of Applied Sciences in Emmen (NL), Michel Leeman started at Syncom. After a couple of years working at Syncom he started his PhD under the supervision of Professor Kellogg. In 2009 he received his PhD from the Rijksuniversiteit Groningen (NL) for his research on the resolution of racemates via different crystallization techniques. Nowadays, he is a project leader but is still involved with many resolution projects at MercachemSyncom.

Hugo Meekes, “Racemization, Deracemization and Isomerization Developments Outside of CORE”

Abstract

A triptych of recent isomerization problems will be presented. The first panel involves deracemization of N-(2-methylbenzylidene)-phenylglycine amide (NMPA). A study of the (de)racemization rates for initially deuterated or protonated versions of both NMPA as well as the solvent, methanol, shows surprisingly different results. A modelling study of the process is will be presented to explain these results. The second panel shows a further racemization method in Viedma ripening, which involves a redox reaction. This was shown for a chiral quinone-hydroquinone molecule that racemizes via a reversible redox reaction. Starting from two achiral reactants, this molecule could be obtained in an enantiopure fashion using Viedma ripening. The third panel illustrates a non-chiral isomerization reaction which leads to a remarkable phenomenon for acetaldehyde phenylhydrazone (APH). The solid forms of APH were investigated in detail over a century ago, with curious results: it was reported that a low melting form could be transformed into a high melting form by trace alkali, and the reverse process could be brought about with trace acid. This curious behaviour has been explained only very recently.

Wim L. Noorduin, “Physical Chemical Routes to Single Handedness”

Abstract

Simple synthetic routes to enantiomerically pure building blocks are of fundamental interest in the discussion on the origin of life, with practical ramifications for the cost-effective production of pharmaceutical compounds. In this lecture, we will explore physical chemical routes to control the handedness during symmetry breaking and use asymmetric amplification schemes to reach complete optical purity. Our approaches are based on a combination of design strategies to tune crystallization behavior and chemical reactivity of desired building blocks such that these can undergo complete deracemization.

Biography

In 2015, Wim Noorduin founded the Self-Organizing Matter group at the NWO institute AMOLF in Amsterdam. His research focuses on the dynamic interplay between chemical reactions and crystallization phenomena to control the emergence of complexity in the solid state.

He received his PhD (cum laude 2010) at the Radboud University Nijmegen with Professor Elias Vlieg, where he developed a simple process for chiral purification by grinding crystals in conjunction with a chemical reaction. As a postdoctoral researcher with Professor Joanna Aizenberg at Harvard University, he then moved on to demonstrate how reaction-diffusion mechanisms can be used to rationally design complex microstructures. Noorduin has received numerous awards including the DSM Science & Technology Award, KNCV Backer prize, and the Rubicon, VENI, and VIDI grants from the Netherlands Organization of Scientific Research.

Jean-Paul Seerden, “Billion Dollar Drugs”

Biography

Jean-Paul Seerden joined Syncom in 1998 after a PhD at the Radboud University Nijmegen on chiral Lewis acid catalyzed cycloaddition reactions and two-year postdoc research on SAR of epibatidine analogues (Solvay Pharmaceuticals) and one-year postdoc research on crystallization-induced asymmetric Strecker reactions (DSM). He is currently involved in the design of new synthetic organic strategies for pharmaceuticals, optimization of medicinal chemistry to development route, with particular interest in asymmetric synthesis. He is senior scientist at Syncom.

Robin Steegman, Artesc Science – Presentation Skills

Abstract

Artesc builds a bridge between the performing arts and communication in science, teaching, business and law. At present, our theatre and prose skills courses are used to improve professional communication in seven countries. We are proud to have helped thousands of scientists, teachers, business and law professionals to reach a substantially higher level of presenting, teaching and writing.

So there you are. Facing a lecture theatre filled with fellow scientists. They have already had six talks – the only thing they want is a coffee break. That’s when you would be glad to have the theatre skills at hand to help you make the coming fifteen minutes a success. But where to begin? In this two-hour workshop you will get to know the basic ideas that can make your performance work in the scientific arena. Discover the secrets from theatre and investigate the impact of subtle changes in your performance. Last but not least, you will learn what it takes to keep the attention of the audience and do justice to the content at the same time. A great way to spend an inspiring day away from the institute and a great start to explore what theatre can do for you.

In this workshop, you will learn what theatre skills can do for scientific presentations. We will investigate how communication works and what you need to communicate effectively with an audience, regardless of its size. This exploration will provide us with one rule to help you translate effective normal communication into effective and authentic stage acting. We will also find that you can keep attention levels up when you change the way you present when discussing different content. The result of using these insights is that even really good presenters can double their impact.

All in all you will learn that:

1. we communicate with everything we do
2. every signal you send out needs to be adjusted to really reach your audience
3. the effect of this adjustment is that the content comes across with greater clarity
4. there is one idea behind achieving this: the first law of stage acting
5. you can dramatically increase the effectiveness

This workshop is definitely an inspiring first encounter with theatre skills. If you aim at really learning to use these skills in your professional performance as a scientist we recommend the *Theatre Skills for Scientists* or the *Art of Presenting Science* courses. If inspiration is enough, this workshop is just what you need.

Biography

Robin Steegman started working with Artesc in 2011. As a graduate from the Guildhall School of Music and Drama in London she has worked as an actress in both The Netherlands, London and beyond. In 2015 Artesc UK became Robin's responsibility. Aside from working with Artesc, Robin runs a production company in London, Robin Linde Productions, where she programmes and produces short films and theatre performances.

Luc Van Hijfte, "A Neglected Compound, for a Neglected Disease: TB or not TB"

Abstract

In 1993, the World Health Organisation had already declared Tuberculosis to be "a global health crisis", as they observed a very clear come-back of the disease, especially with the appearance of multi-drug resistant strains of the Microbacterium. The over 40-year-old therapy thus needed a fast renewal, preferably with novel treatments relying on different mechanisms of action, in order to successfully tackle the resistance problem.

A general antibacterial screen at Janssen has led to the identification of a novel compound class active against Mycobacterium Smegmatis, and thanks to the perseverance of a number of project champions, the project eventually made it up to a novel marketed drug Bedaquiline.

The story of the discovery of this novel anti-tuberculosis drug will be presented, with some special focus to the importance of the stereochemistry in this novel class of compounds.

Biography

Luc Van Hijfte is of Belgian Nationality. He obtained his PhD in Organic Chemistry from Ghent University, with professor M. Vandewalle, in 1984, and then moved to the US for a post-doctoral stay at the University of California, Santa Barbara, with Prof R.D. Little. Upon his return, he spent an additional post-doctoral year at the University of Ghent, working on analogs of Vitamine D, before joining the Merrell Dow Research Institute (later Marion Merrell Dow) in Strasbourg in 1986, to start his professional career as a medicinal chemist, working on different projects mainly in the CNS area. In 1996, he became the Head of the Chemistry Department. In 2001 he joined Janssen Research & Development (Johnson & Johnson), initially as the research Director of the Janssen Research Center in Val de Reuil, France, and in 2009 he became the Head of Medicinal Chemistry for Europe, covering Medicinal Chemistry, analytics and ADMET, spanning the 3 therapeutic areas CNS, oncology and Infectious diseases. In early 2012, he left J&J to get active in smaller and leaner companies, with receptively a new role as CSO Drug Discovery at NovAliX, the creation of Les Laboratoires Phytodia, a start-up active in the area of plant-derived cosmetics and nutraceuticals, and In October 2017, he joined MercachemSyncom as their SVP Medicinal Chemistry, overlooking all medicinal chemistry activities and projects. Van Hijfte has authored >50 peer reviewed papers and has participated actively to over hundreds of new patent applications with his research teams, and >20 compounds reaching advanced clinical development, of which one reached the market. He was the president of the French Medicinal Chemistry Society (Société de Chimie Thérapeutique) in 2017-18 and is currently an executive committee member of the European Federation of Medicinal Chemistry (EFMC).

Appendix 1 – Workshop Participants

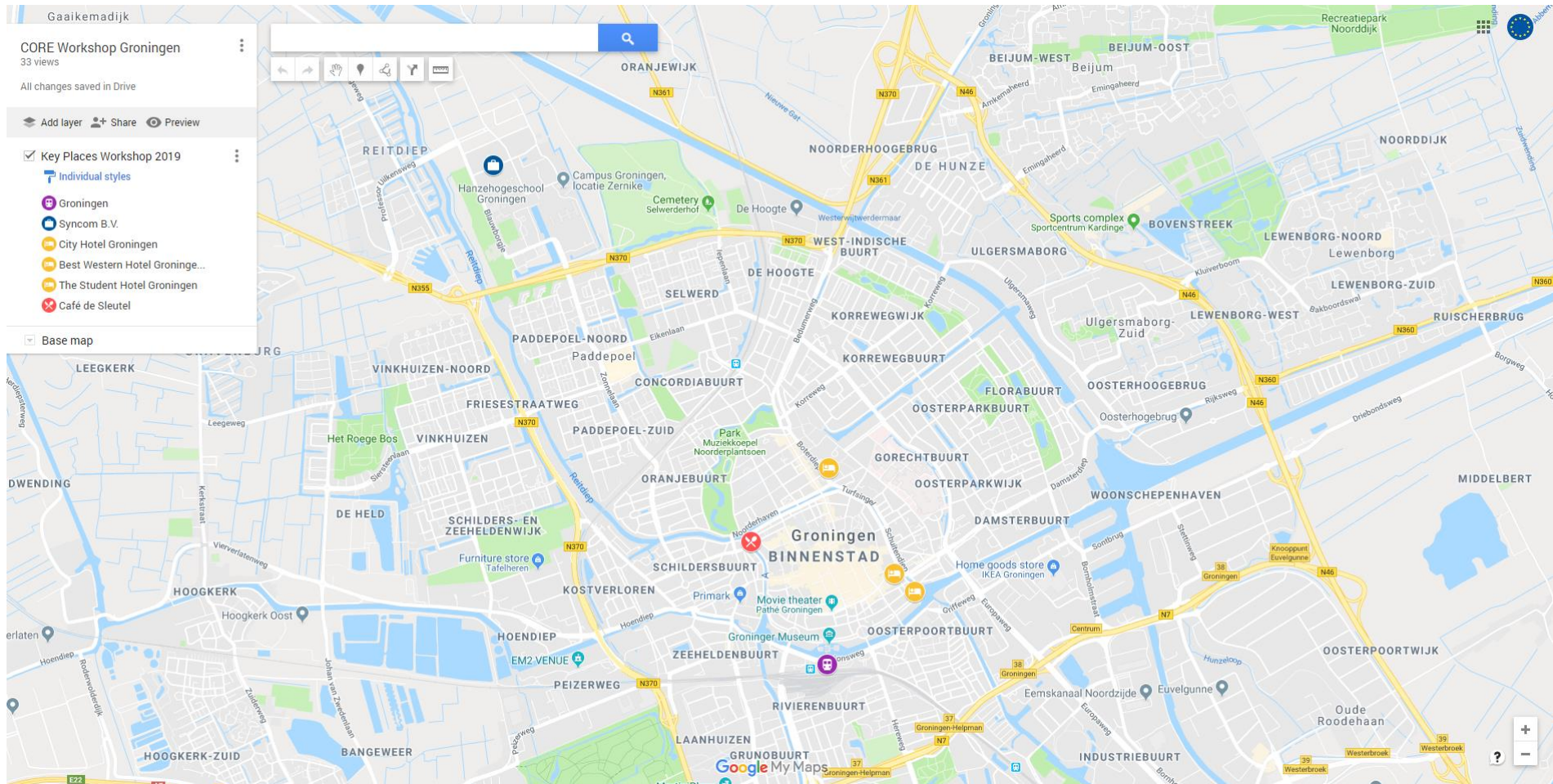
Category:	First Name:	Family Name:	Organisation:
EXT	Luc	Aerts	UCB Pharma
PD	Iarik	Baglai	AMOLF Amsterdam
ESR	Giuseppe	Belletti	Radboud University Nijmegen
ESR	Shashank	Bhandari	Otto von Guericke University Magdeburg
ESR	Brigitta	Bodák	ETH Zurich
ESR	Francesca	Breveglieri	ETH Zurich
ESR	Francesca	Cascella	Otto von Guericke University Magdeburg
ESR	Maxime	Charpentier	University of Strathclyde
ESR	Jan-Joris	Devogelaer	Radboud University Nijmegen
FP	Valérie	Dupray	University of Rouen
AP	Gérard	Guillamot	Seqens (PCAS)
SPKR	Mark	Hamminga	Syncom
ESR	Lina	Harfouche	University of Rouen
ESR	Johannes	Hoffmann	University of Strathclyde
SPKR	Bernard	Kaptein	Innosyn Laboratories
FP	Richard	Kellogg	Syncom
SPKR	Michel	Leeman	Syncom
EXT	Tom	Leysens	Louvain-la-Neuve (UCL)
AP	Heike	Lorenz	Max Planck Institute for Dynamics of Complex Technical Systems
AP	David	Maillard	Merck KGaA
ESR	Aliou	Mbodji	University of Rouen
SPKR	Hugo	Meekes	Radboud University
SPKR	Wim L.	Noorduin	AMOLF Amsterdam
ESR	Ryusei	Oketani	University of Rouen
AP	Mihaela	Pop	TeraCrystal
ESR	Ghufran ur	Rehman	University of Manchester
FP	David	Rush	University of Strathclyde
FP	Claire	Scott	University of Strathclyde
SPKR	Jean-Paul	Seerden	Syncom
SPKR	Robin	Steggman	Artsec
FP	Joop	ter Horst	University of Strathclyde
ESR	Carola	Tortora	FAU Erlangen
ESR	Giulio	Valenti	Syncom
SPKR	Luc	van Hijfte	MercachemSyncom
AP	Jan	van Krieken	Corbion (Purac)
ESR	Raghunath	Venkatramanan	University of Strathclyde
FP	Elias	Vlieg	Radboud University

Category Key: AP – Associate Partner, ESR – Early Stage Researcher, EXT – External, FP – Full Partner (Beneficiary), SPKR – Speaker, PD – Postdoc

Appendix 2 – Gantt Chart

	2016			2017												2018												2019												2020																						
	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N
Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48														
Researcher Recruitment	ESR1 Shashank Bhandari OVGU												ETH													USTRAT																																				
	ESR2 Johannes Hoffmann USTRATH													OVGU						RUN																																										
	ESR3 Francesca Cascella OVGU																	UR									MERCK PCAS											ETH																								
	ESR4 Brigitta Bodák ETH																																																													
	ESR5 Giuseppe Bellelli RUN													UST								FAU																																								
	ESR6 Giulio Valentini SYNCOM													UST								UR																																								
	ESR7 Ryusei Oketani UR														ETH													RUN																																		
	ESR8 Francesca Breveglieri ETH																UM UR												UM																																	
	ESR9 Carola Tortora FAU																																																													
	ESR10 Jan Joris Devogelaer RUN																																																													
	ESR11 Aliou Mbodji UR																																																													
	ESR12 Lina Harfouche UR																																																													
	ESR13 Maxime Charpentier USTRATH																																																													
	ESR14 Raghu Venkatramanan USTRATH																	UR																																												
	ESR15 Ghufan ur Rehman UM																																																													
Training	Intro I/Workshop 1-3			I																																																										
	Summerschool												I																																																	
	Conference																																																													
	Webinar Course																																																													
	Visiting Scientist																																																													
	Portfolio of Skills																																																													
Management	Coordinator				A		M																																																							
	SC Meetings	TC	TC	TC	K		TC																																																							
	SB Meetings																																																													
	Tool Reports/articles				1																																																									
Dissemination	Scientific community																																																													
	Industrial community																																																													
	Public engagement																																																													
Exploitation	IPR																																																													
	Entrepreneurship																																																													

Appendix 3 – Practical Information



[\[view Google map\]](#)

Venue

The entire CORE workshop, Monday 20 - Friday 24 May 2019, will take place at Syncom, which is located just outside of Groningen city centre (see below for information on how to get there from Groningen).

Meetings will take place in the building located at Mudden 12. On arrival at the Zernike Campus bus stop, you will see that one side of the road (Zonnelaan) has many different buildings. On the other side, you will see a very large, new, brown-coloured building. Just to the left of this, there is a row of four buildings, the second of which has a huge sign which reads "SYNCOM". This is the Mudden 12 building.

However, for registration and badges, you must go the building located at Kadijk 3. This is a building perpendicular to Mudden, and on the other side (not visible from the bus stop). It is best to walk back along the Zonnelaan for around 200 metres, turn right at the intersection (Kadijk) and walk to the second building on the right. This is the main Syncom building. The entry and secretarial office are at the side of the building. You will be escorted to the Mudden building.

In the Mudden building, most meetings will be held in the main lecture room (collegezaal) on the ground floor. For entry, a digital pass is necessary. Go either with a Syncom guide, or ring the bell and someone will come. Most other meetings will be held in other rooms within the Mudden building.



Using the wireless network as a visitor to Syncom

Name of the Wi-Fi: Syncom Guest
Security key: S_ync0M88 (0 = zero)

Transport

Arrival Transport - Getting to Groningen

By train from Amsterdam Schiphol:

The easiest way to travel to Groningen from Amsterdam (Schiphol) Airport is to take the train. The underground train station is located near Schiphol Plaza, within several minutes walking distance of the luggage claim. The Dutch railway system is run by Nederlandse Spoorwegen and known as NS. You will recognize it by its yellow and blue colours. Look for the yellow illuminated signs that read "To the trains". You

can buy train tickets at the Tickets and Service counter and at the NS self-service machines. You can also buy tickets online. Be sure to buy a ticket before you get on the train. It is not possible to buy tickets on the train.

Do not forget to have your ticket stamped at the automatic machine at the entrance to the platform before boarding the train.

There is a direct hourly train service to Groningen from Schiphol Airport. Check either the yellow and blue NS timetable boards or the television screens. Additional connections on the half hour involve just one change of trains at Zwolle. You just go from one side of the platform to the other at Zwolle. Make sure that you board one of the carriages marked with the destination Groningen (the other part of the train travels to Leeuwarden).

The journey from Amsterdam or Schiphol Airport to Groningen takes a little over 2 hours. Information is given regularly, usually also in English. There is also a television screen in each carriage with times and stops. For further information and journey planner, visit: <https://www.ns.nl/en/journeyplanner#/?tijd=2018-10-15T11:48&type=vertrek>

By train from Amsterdam

A direct train runs from Amsterdam-Centraal every hour. There is also the option to take a train with one change, which requires passengers to transfer at Zwolle. If transferring at Zwolle, follow the instructions above.

By car

The A28 motorway connects the city of Groningen to Utrecht (via Zwolle and Amersfoort). The A7 motorway connects Groningen to Friesland and Amsterdam (South-West) and Winschoten and Bremen (East).

Getting around Groningen

Everyone should have access to Google Maps via their mobile phone. The centre of Groningen is given in detail on the map. Walking distance from the hotels to either the city centre (Grote Markt, look for highest church tower, the Martini church) or the railway station (directly across the water from the Groningen museum) is not more than 10 minutes (unless you get lost).

City transportation in Groningen proper and the wider Groningen area consists of railway and bus services. Cycling is also incredibly popular, and as such, Groningen has been dubbed the "World Cycling City" because 57% of journeys within the city are made by bicycle.

Groningen's main railway station (locally called "*Hoofdstation*" or "Main Station") has regular services to most major cities in the Netherlands. The city's other two railway stations are Europapark and Noord. There are 25 main city and regional bus routes, and it is possible to travel directly by bus from Groningen to Bremen, to Hamburg, to Berlin and to Munich.

Getting to Syncom from Groningen:

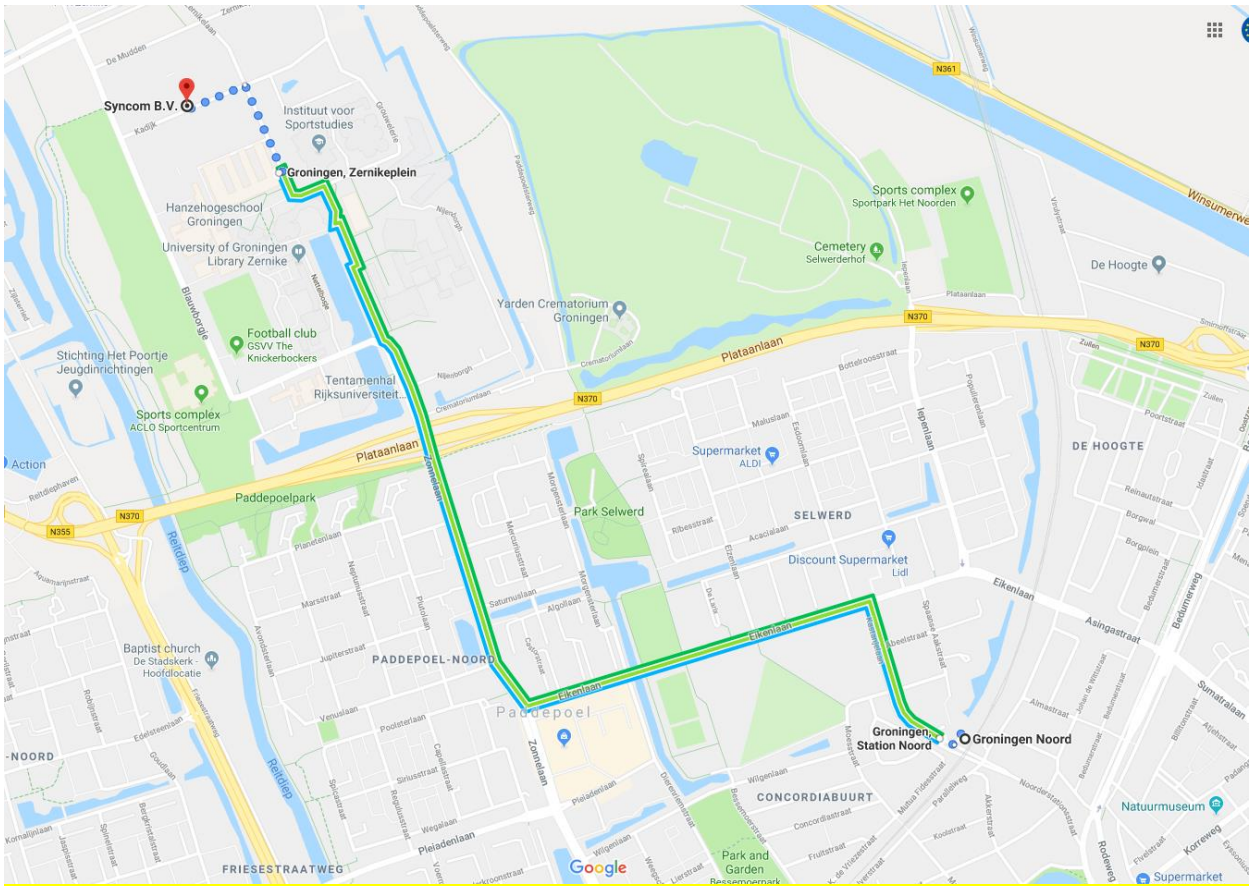
To get to Syncom from Groningen, it is advisable to take the bus.

Within the city of Groningen, several bus lines connect the outer districts with the city centre and the railway station. There are two direct bus lines from, and to, the Zernike campus where Syncom is located. These are lines 11 and 15:

Line 11 from railway station, which is close to Zuiderdiep (= City Hotel), or city centre (=Grote Markt) to Zernike Campus.

Line 15 from Railway station to Zernike Campus.

You can buy single tickets on the bus.



Social Programme

There will be a guided tour of Groningen <https://toerisme.groningen.nl/en/see-and-do/group-packages/guided-tours/guided-walking-tours> on Tuesday 21 May at 3pm. Meeting point: VVV Informatiewinkel (Tourist information Office Groningen), Grote Markt 29, 9712 HS Groningen.

A network dinner will take place on Tuesday 21 May in Groningen - [Café de Sleutel](#) Noorderhaven 72 9712 VM Groningen, Tel: 050-3181454

Groningen

Groningen is the main municipality as well as the capital city of the eponymous province in the Netherlands. It is the largest city in the north of the Netherlands and has approximately 230,000 inhabitants. The population of the Groningen-Assen metropolitan area is around 500,000.

The city was founded at the northernmost point of the Hondsrug area. The oldest document referring to Groningen's existence dates from 1040, yet the city existed long before then: the oldest archaeological traces found are believed to stem from the years 3950–3720 BC, although the first major settlement in Groningen has been traced back to the 3rd century AD.

The city is nationally known as the “Metropolis of the North”, and as “Martinistad”, which refers to the tower of the Martinitoren, named after its patron saint Martin of Tours. Although not a very large city, Groningen has an important role as the main urban centre of this part of the Netherlands, particularly in the fields of music and other arts, education, and business. People from Groningen are known as Groningers.

Groningen is a university city, with an estimated 31,000 students at the University of Groningen (as of October 1, 2018), and an estimated 29,000 at the Hanze University of Applied Sciences (as of October 1, 2018). The University of Groningen educated the first female student in the Netherlands, Aletta Jacobs, the first Dutch national astronaut, Wubbo Ockels, the first president of the European Central Bank, Wim Duisenberg, and two Nobel prize winners, Heike Kamerlingh Onnes and Ben Feringa.

Since 2016, Groningen has been a host of the International Cycling Film Festival, an annual film festival for bicycle-related films. One of the biggest running events in the Netherlands, the 4 Miles of Groningen, takes place in the city every year on the second Sunday in October. Groningen is also the host city for Eurosonic Noorderslag, an annual music showcase event for over a hundred bands from all over Europe.

Climate and weather

In spring/summer, temperatures vary between 7 and 20°C, and the weather alternates between cloudy and sunny. You can check the forecast here: <https://www.accuweather.com/en/nl/groningen/248345/weather-forecast/248345>

Electricity

The Netherlands' electrical current is 230 V -- 50 Hz: sockets take the standard continental European dual round-pronged plugs. A plug adaptor is required for non-European appliances.

Emergency numbers

The European emergency number 112 is the only emergency number in the Netherlands. The average time to answer a 112 call is 3 seconds.

Medical services

Citizens of the EU receive free or reduced-cost state-provided health care cover with the European Health Insurance Card (EHIC) for medical treatment that becomes necessary while in UK: <http://ec.europa.eu/social/main.jsp?catId=559>

Telephone

The international access code for the Netherlands is +31.

Time Zone

The Netherlands is currently in the Central European Summer Time Zone which is 2 hours ahead of Coordinated Universal Time (+2 UTC).

Tipping

In restaurants in the Netherlands, a service charge of about 5% is often included in menu prices. Round the bill up to a convenient figure, or leave a few euros extra, if you've really enjoyed the meal and feel that the service was exceptional. If were not satisfied, don't leave anything. Leave the tip as change rather than putting it on your credit card. Tipping 15%–20% of the cost of a meal is not common practice in the Netherlands.

Although a service charge is also included in hotel, taxi, bar, and café bills, the Dutch mostly round up the change to the nearest 2 to 4 euros for large bills and to the nearest euro for smaller ones. Consider tipping in bars only if you were served at a table.

Tourist information

VVV Informatiewinkel
Grote Markt 29
9712 HS Groningen
E-mail info@vvvgroningen.nl
Tel: +31 50 313 97 41
Opening hours
Monday 12:00 to 18:00
Tuesday to Friday 09:30 to 18:00
Saturday 10:00 to 18:00
Sunday 11:00 to 16:00
Closed on bank holidays

Appendix 4 – Groningen Map

You can download this version of the map:

http://www.orangesmile.com/common/img_city_maps/groningen-map-0.jpg



Appendix 5 - Contact Details

CORE Network Coordinator:

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CORE Social Platforms



We wish you a pleasant stay in Groningen!

www.coreitn.eu