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

Final Workshop & Mini-Symposium 2019

Friedrich-Alexander Universität Erlangen-Nürnberg,
Tuesday 8 – Friday 11 October 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.

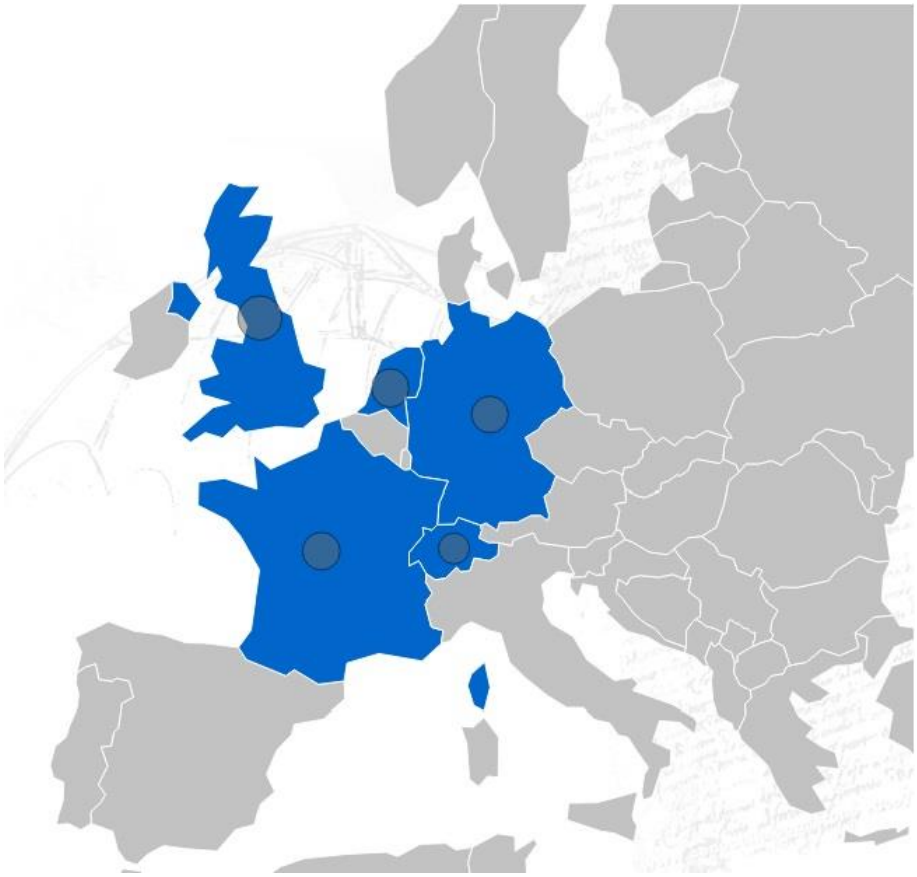

Figure 1: Beneficiary partner countries

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

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	Y
8	IMPRS/CORE Joint Summer School – Particulate Systems: From Theory to Applications	2	OVGU/MPI, Magdeburg, Germany	26 – 30 August 2019	35	Y
9	Final Workshop* and Mini-Symposium		FAU, Erlangen, Germany	8-11 October 2019	37	
10	ISIC Conference – CORE Session on Chirality & Resolution [deadline for abstracts 31 January 2020]		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.

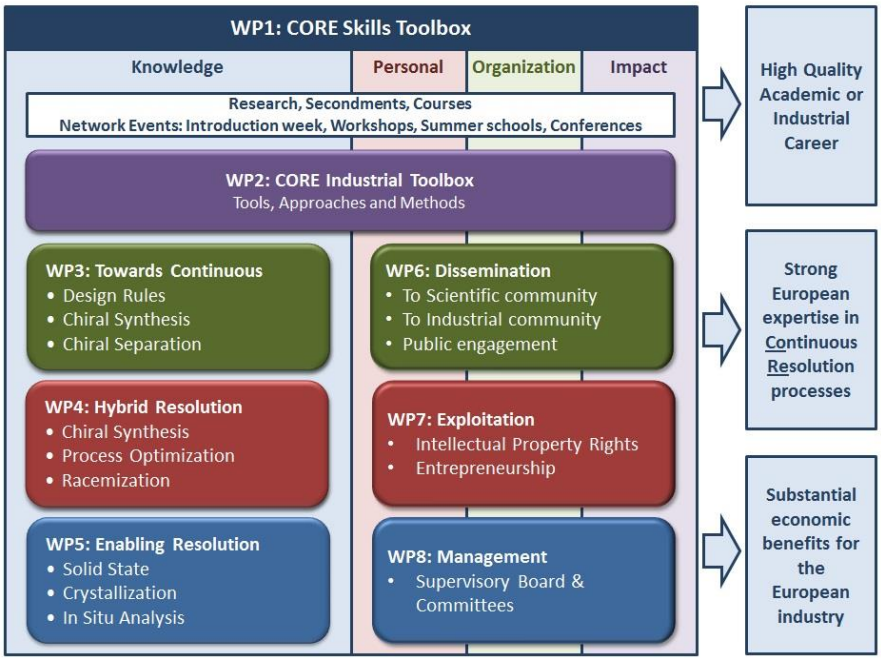

Figure 3: Each ESR will develop, validate and deliver a tool, approach or method within WP3-5 to be integrated in the CORE Industrial Toolbox (WP2), see Figure 4 for the relation between WP and individual ESR projects. Through WP2 the ESRs will be trained to work in an international multidisciplinary 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

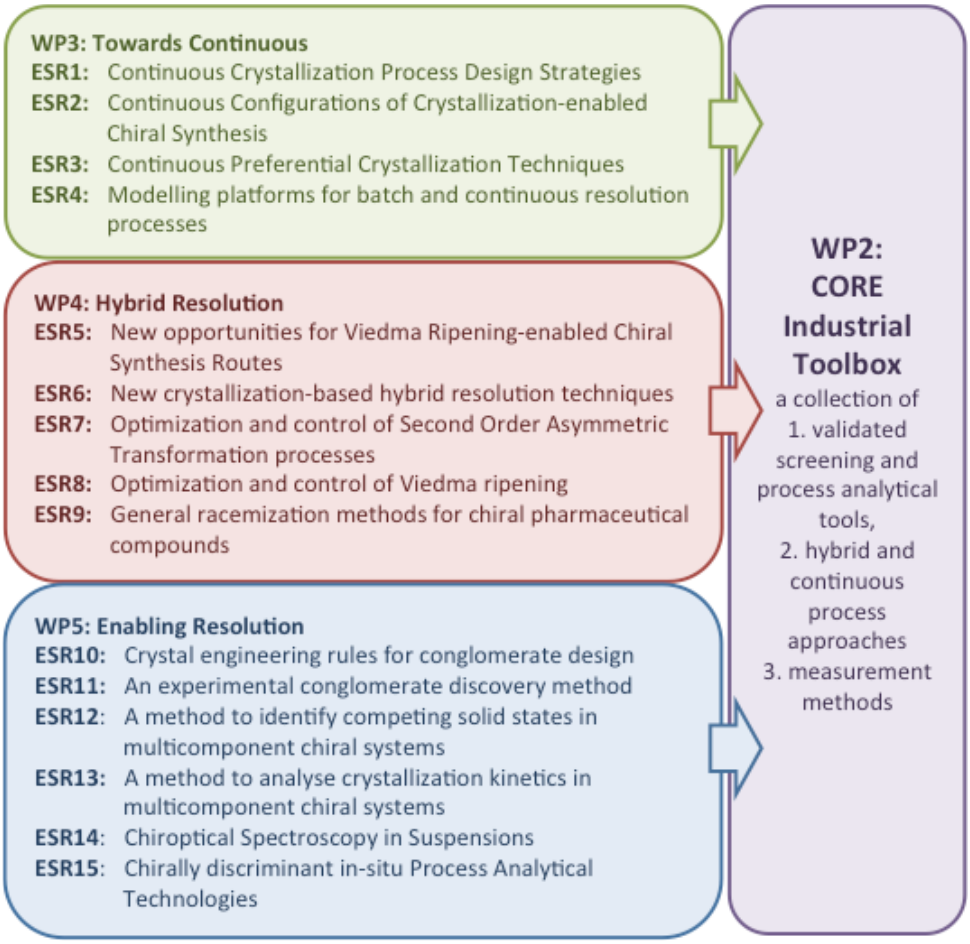

Figure 4: Relationship between WP and individual ESR projects

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.

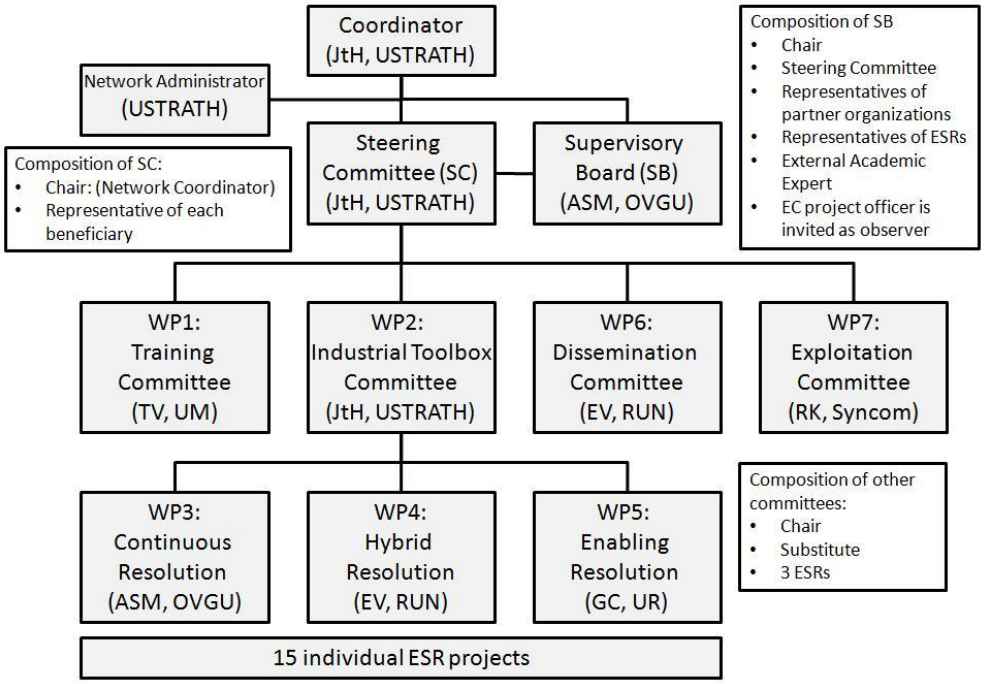

Figure 5: CORE management structure

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	Gufrhan 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 Final Workshop & Mini-Symposium

This CORE Final workshop is the fifth additional workshop for the CORE network participants only. Three days, Tuesday 8 to Thursday 10 October are dedicated to CORE network activities, and the final day (morning of Friday 11 October) consists of a mini-symposium, which is open to all.

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 and project assistant are invited to attend the workshop to discuss the CORE project.

The full programme is outlined on the following pages.

3 Programme

Final Workshop, 8-11 October 2019 – Hosted by Friedrich–Alexander University Erlangen–Nürnberg (FAU)

Tuesday 8 October 2019

Unless stated otherwise, meetings will take place in Lecture Hall "Hörsaal" C3 of Chemikum, Niklolaus-Fiebiger-Straße 10, 91058 Erlangen.

Registration will take place in the Entrance Hall.

13:30-13:45 Registration (Entrance Hall) and Coffee (Lecture Hall "Hörsaal" C3, first floor on the right)

13:45-14:00 Welcome Prof. Tsogoeva; Introduction Joop ter Horst

14:00-16:00 CORE Toolbox Presentations WP3 x 4 (25 min plus 5 min Q&A per person)
- 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)
- ESR4: Brigitta Bodak, ETH Zurich (Swiss Federal Institute of Technology in Zurich), Switzerland (ETH)

16:00-16:15 Break

16:15-17:45 CORE Toolbox Presentations WP5 x 3 (25 min plus 5 min Q&A per person)
- ESR11: Aliou Mbodji, University of Rouen, France (UR)
- ESR10: Jan-Joris Devogelaer, Radboud University Nijmegen, Netherlands (RUN)
- ESR12: Lina Harfouche, University of Rouen, France (UR)

Return to hotel; everyone free for the evening. Erlangen has many restaurants ranging from reasonably priced to expensive. Even during the week is highly recommended to book a table in advance.

Wednesday 9 October 2019

09:00-10:30 CORE Toolbox Presentations WP5 x 3 (25 min plus 5 min Q&A per person)
- ESR13: Maxime Charpentier, University of Strathclyde, Glasgow, UK (USTRATH)
- ESR15: Ghufran ur Rehman, University of Manchester, UK (UM)
- ESR14: Raghunath Venkatramanan, University of Strathclyde, Glasgow, UK (USTRATH) – ***virtual presentation***

10:30-11:00 Break

11:00-12:30 CORE Toolbox Presentations WP4 x 3 (25 min plus 5 min Q&A per person)
- ESR5: Giuseppe Belletti, Radboud University Nijmegen, Netherlands (RUN)
- ESR7: Ryusei Oketani, University of Rouen, France (UR)
- ESR6: Giulio Valenti, SYNCOM, The Netherlands

12:30-14:00 Lunch (Seminar Room 00.111, ground floor on the right)

14:00-15:00 CORE Toolbox Presentations WP4 x 2 (20 min plus 5/10min Q&A per person)
- ESR8: Francesca Breveglieri, ETH Zurich (Swiss Federal Institute of Technology in Zurich), Switzerland (ETH)

- ESR9: Carola Tortora, Friedrich - Alexander University Erlangen - Nürnberg, Germany (FAU)

15:00-15:15 Break (Seminar Room 00.111)

15:15-16:45 Supervisory Board meeting (Beneficiary partners, Associate partners and three ESR reps)

Return to hotel; everyone free for the evening. Erlangen has many restaurants ranging from reasonably priced to expensive. Even during the week is highly recommended to book a table in advance.

Thursday 10 October 2019

09:30-10:30 Steering Committee meeting (Beneficiary partners only) (Seminar Room 00.111)

10:30-10:45 Break (Seminar Room 00.111)

11:00-11:45 Toolbox Summary and Discussion

11:45-12:30 Networking – ESR Career Discussion with PIs and Industry Partners

12:30-13:00 Sandwich Lunch (Seminar Room 00.111)

13:00-evening Social Event - Trip to Nuremberg

Friday 11 October 2019 – Mini Symposium (Open to Externals)

09:00-09:15 Introduction to Symposium - Prof. Svetlana B. Tsogoeva,
CORE Principal Investigator (Friedrich-Alexander University, Germany)

09:15-10:00 Prof. Malte Kaspereit, Institute of Separation Science & Technology (Friedrich-Alexander University, Erlangen-Nuremberg, Germany Advanced processes based on chromatography and allied techniques to produce single enantiomers [abstract]

10:00-10:45 Professor Gerard Coquerel, CORE Principal Investigator (University of Rouen)
Chiral Discrimination in the solid state [abstract]

10:45-11:00 Coffee break

11:00-11:45 Prof. Jan-E Bäckvall, Department of Organic Chemistry (Stockholm University)
Deracemization of Alcohols and Amines via Chemoenzymatic Dynamic Kinetic Resolution [abstract]

11:45-12:00 Final words
Prof. Svetlana B. Tsogoeva, Prof. Joop ter Host and Prof. Andreas Seidel-Morgenstern, CORE Principal Investiagtors and Sympsoium Scientific Programme Committee

12:00-13:00 Lunch and close – CORE members only (13:00) (Seminar Room 00.111)

FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

Department Chemie und Pharmazie

CORE Mini-Symposium
on Deracemization of Chiral Compounds

Free Admission

October 11, 2019, 9:00 - 12:00

Prof. Dr. Jan-E. Bäckvall
Stockholm University, ***Sweden***
„Deracemization of alcohols and amines via chemoenzymatic dynamic kinetic resolution“

Prof. Dr. Gérard Coquerel
Université de Rouen, ***France***
„Chiral discrimination in the solid state”

Prof. Dr.-Ing. Malte Kaspereit
FAU Erlangen-Nürnberg, ***Germany***
„Advanced processes based on chromatography and allied techniques to produce single enantiomers“

Chemikum, lecture hall C3
Nikolaus-Fiebiger-Straße 10
91058, Erlangen, Germany

Scientific Programme Committee:
Prof. Dr. Andreas Seidel-Morgenstern, ***MPI Magdeburg***
Prof. Dr. Joop ter Horst, ***University of Strathclyde***
Prof. Dr. Svetlana B. Tsogoeva, ***FAU Erlangen-Nürnberg***

For contact: svetlana.tsogoeva@fau.de **For registration: carola.tortora@fau.de**

Acknowledgement

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http://www.coreitn.eu/

Continuous Resolution and Deracemization of Chiral Compounds by Crystallization

Mini-Symposium Speaker Abstracts

Prof. Malte Kaspereit, FAU, "Advanced processes based on chromatography and allied techniques to produce single enantiomers"

Abstract

The production of highly pure single enantiomers is a relevant but also challenging task in the production of pharmaceuticals and fine chemicals. Industrially, most enantiopure substances are produced by a non-selective synthesis of racemates, i.e. the 50/50 mixture of both isomers. In this case, the enantiomeric form with the desired physiological effect has to be isolated from the racemic mixture by a subsequent separation using, for example, chemical and biochemical conversions, crystallization, or chromatography. The overall yield of this approach is 50% only. Overcoming this limit requires combining the separation with an isomerization (racemization) of the undesired enantiomer.

In the presentation, different process concepts are discussed that are based upon techniques like chromatography, crystallization, membrane separations, and racemization reactions for the production of single enantiomers from racemic mixtures. Particular focus is on preparative-scale chromatography, which represents a fast and efficient "work horse" for extremely difficult chiral separations. The potential of various clever chromatographic operating modes like recycling schemes and simulated moving bed (SMB) chromatography is discussed. Finally, several process combinations are presented that purposefully combine chromatography with other separation methods and racemization reactions. Using different examples, it is demonstrated how such processes can be developed based on combined experimental and theoretical methods, and which performance is achievable.

Prof. Gerard Coquerel, CORE Principal Investigator, "Chiral Discrimination in the solid state"

Abstract

This lecture aims at conveying two messages: There are clusters of conglomerates: the well accepted 5 to 10% probability of conglomerates is actually deceptive as in some series of structurally related derivatives a family of 10 chiral molecules can crystallize as stable conglomerates. By contrast, in some other series of chiral molecules it is hard to find any (e.g. Baclofen 1 out of 117 salt derivatives). Some pro-chiral molecules can crystallize in one of the 65 Sohncke space groups and therefore predisposes the structurally related chiral derivatives to crystallize as stable conglomerate. There are some pockets which can be filled with various substituents so that the main features of the packing are preserved.

Prof. Jan-Erling Bäckvall, Stockholm University, "Deracemization of Alcohols and Amines via Chemoenzymatic Dynamic Kinetic Resolution"

Abstract

The combination of an enzymatic resolution and a metal-catalyzed racemization has been developed into an efficient methodology for dynamic kinetic resolution (DKR) of alcohols and amines (Scheme 1). In 1997 we reported on an efficient method for the dynamic kinetic resolution of sec-alcohols using a lipase and a ruthenium catalyst. Since then a large number of metalloenzymatic systems for DKR have been reported. Recent extensions of the metal racemization catalyst have included 1st row iron complexes.

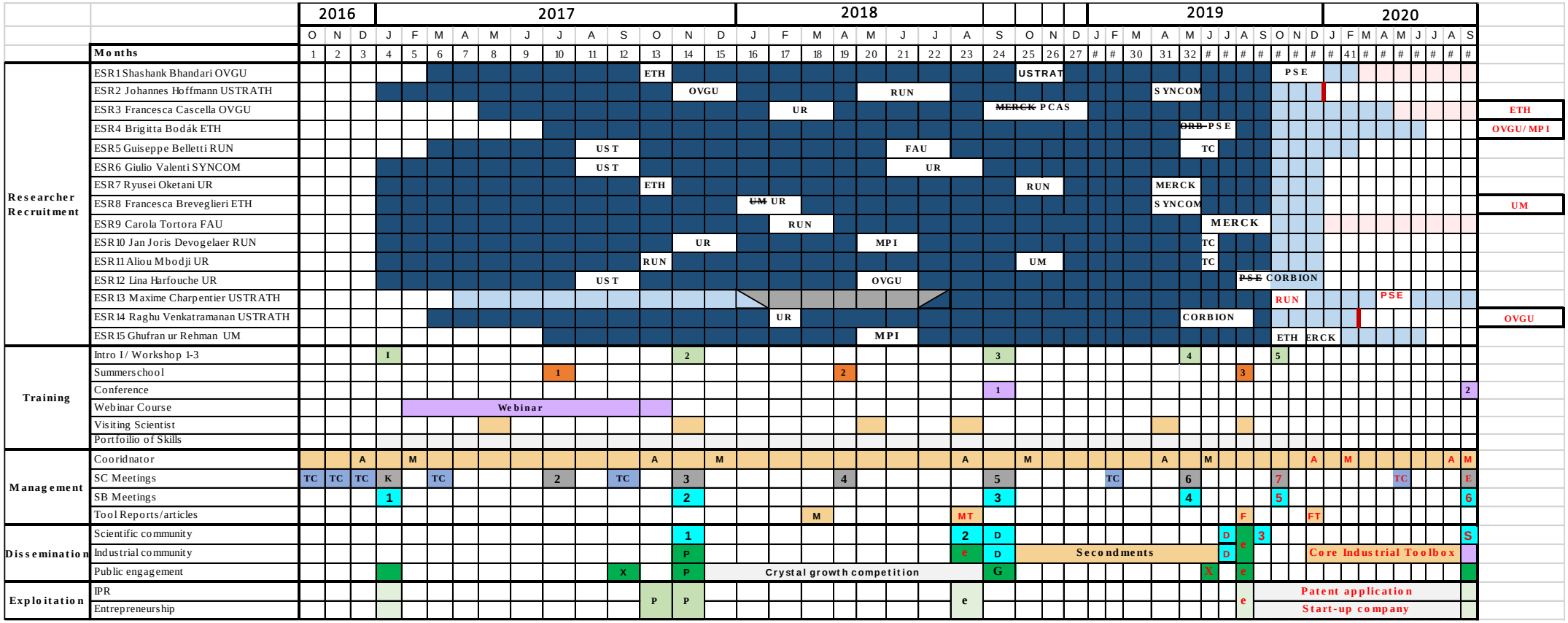
The DKR reactions have been applied to the enantioselective synthesis of various biologically active compounds where the asymmetric transformation of Scheme 1 has been used as a key step. Recently we have developed hybrid catalysts for the DKR of amines (Fig. 1). These hybrid catalyst mimic metalloenzymes and were used for dynamic kinetic resolution of primary amines in high yield and excellent enantioselectivity.

Appendix 1 – Workshop Participants

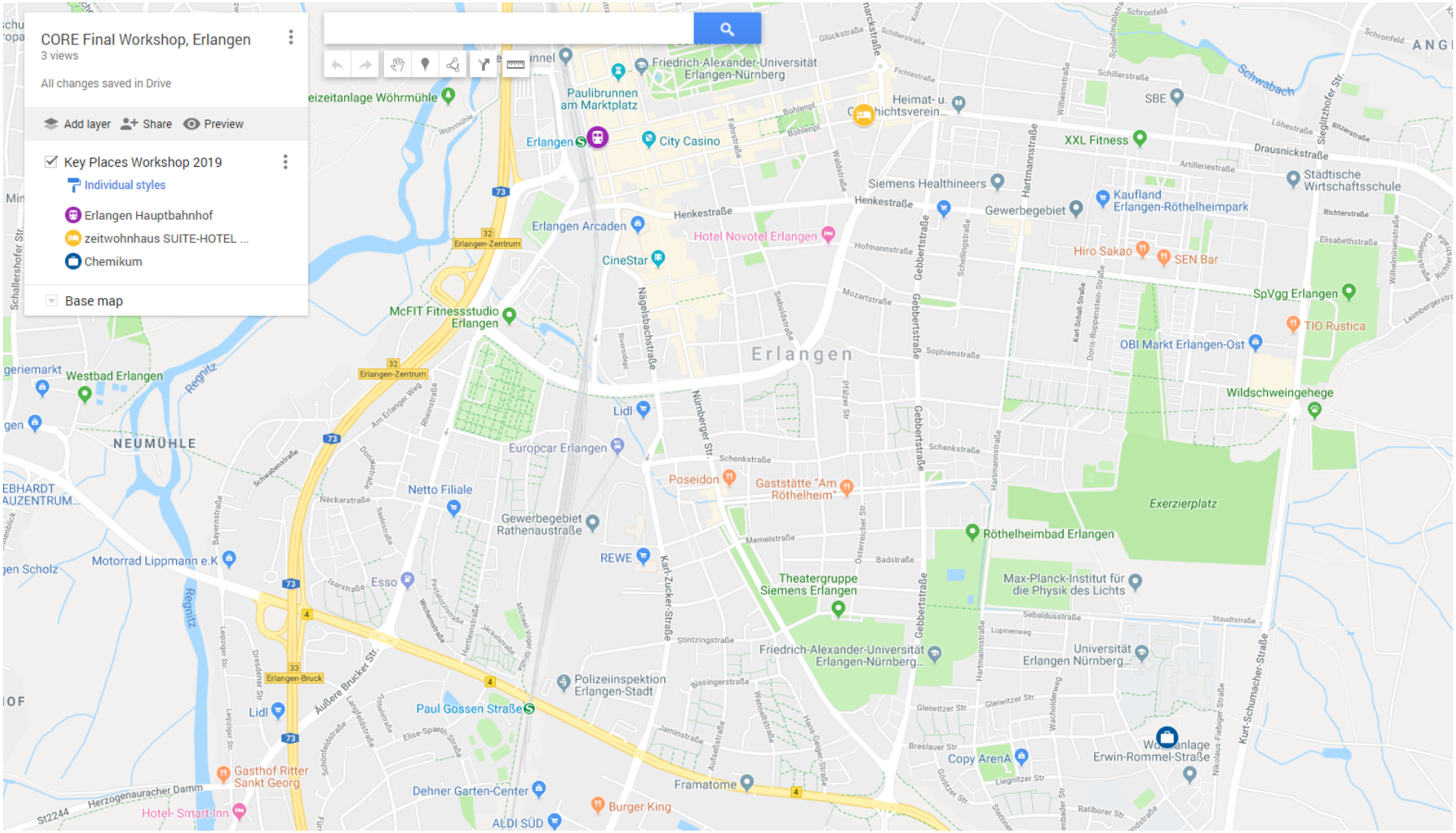
Category:	First Name:	Family Name:	Organisation:
SPKR	Jan-Erling	Bäckvall	Stockholm University
ESR	Giuseppe	Belletti	Radboud University Nijmegen
ESR	Shashank	Bhandari	Otto von Guericke University Magdeburg
ESR	Brigitta	Bodák	ETH Zurich
ESR	Francesca	Breveglieri	ETH Zurich
ESR	Francesca	Cascella	Otto von Guericke University Magdeburg
ESR	Maxime	Charpentier	University of Strathclyde
FP	Gerard	Coquerel	University of Rouen
ESR	Jan-Joris	Devogelaer	Radboud University Nijmegen
FP	Valérie	Dupray	University of Rouen
AP	Gérard	Guillamot	Seqens
ESR	Lina	Harfouche	University of Rouen
ESR	Johannes	Hoffmann	University of Strathclyde
SPKR	Malte	Kaspereit	FAU Erlangen
EXT	Tom	Leyssens	Louvain-la-Neuve (UCL)
AP	Heike	Lorenz	Max Planck Institute for Dynamics of Complex Technical Systems
AP	David	Maillard	Merck KGaA
FP	Marco	Mazzotti	ETH Zurich
ESR	Aliou	Mbodji	University of Rouen
ESR	Ryusei	Oketani	University of Rouen
ESR	Ghufran ur	Rehman	University of Manchester
EXT	Celine	Rougeot	UCB Pharma
FP	David	Rush	University of Strathclyde
FP	Claire	Scott	University of Strathclyde
FP	Andreas	Seidel-Morgenstern	Otto-von-Guericke University Magdeburg
FP	Joop	ter Horst	University of Strathclyde
ESR	Carola	Tortora	FAU Erlangen
FP	Svetlana	Tsogoeva	FAU Erlangen
ESR	Giulio	Valenti	Syncom
FP	Thomas	Vetter	University of Manchester
FP	Elias	Vlieg	Radboud University

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

Appendix 2 – Gantt Chart



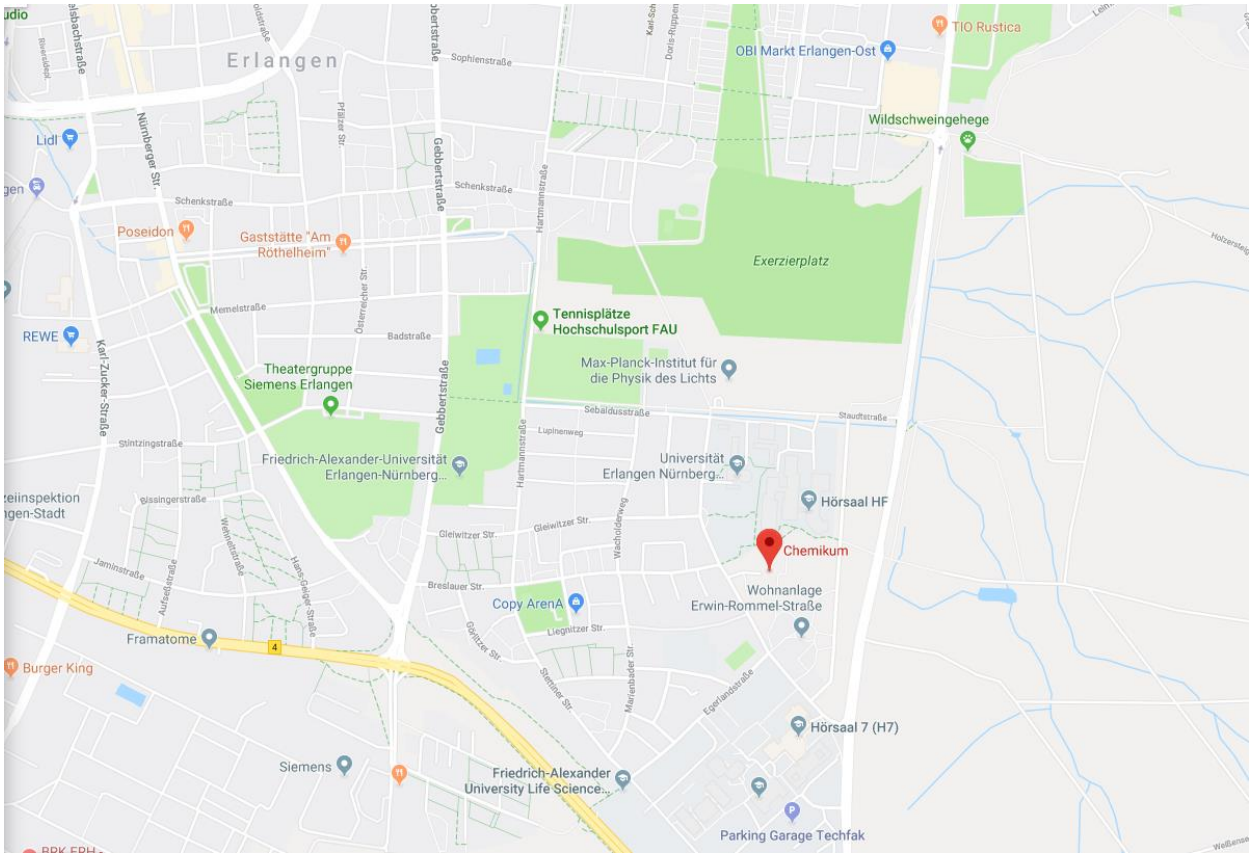
Appendix 3 – Practical Information



[view Google map]

Venue

The entire CORE workshop, Tuesday 8 - Friday 11 October 2019, will take place at Friedrich–Alexander University Erlangen–Nürnberg, which has campuses in both Erlangen and Nuremberg. The Workshop will take place on the Erlangen campus, within Lecture Hall C3 at "Chemikum", Niklolaus-Fiebiger-Straße 10, 91058 Erlangen.



Using the wireless network as a visitor to FAU

As well as EduRoam for partner from educational establishments, WLAN will be available for all participants. You will receive the access code during the registration.

Transport

Arrival Transport - Getting to Erlangen

By train from Munich Airport

The easiest way to travel to Erlangen from Munich Airport is to take the train and the quickest route is via Munich. The train station, Munich Airport Terminal station, is located in a tunnel directly beneath the central area between both passenger terminals. The airport is connected to the city by Munich suburban railway (S-Bahn) lines S 1 and S 8. The ride takes approximately 35-40 minutes to the Munich Hauptbahnhof in the city centre. You can buy train tickets at the ticket machines in the airport. You can also buy tickets online or through the DB Navigator app.

There is a direct train service from the Munich Hauptbahnhof to Erlangen every two hours. Check the timetable boards which are visible throughout the station. Additional connections, which arrive semi-frequently, involve just one change of trains at Nuremberg. Check online or consult the DB app for live updates regarding platform numbers.

Travelling direct, the journey from Munich to Erlangen takes around 1 hour 20 minutes. Travel time for journeys involving changes varies. Information on trains 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.bahn.com/en/view/index.shtml

By train from Munich

A direct train runs from Munich Hauptbahnhof every 2 hours. There is also the option to take a train with one change, which requires passengers to transfer at Nuremberg. If transferring at Nuremberg, check online or consult the DB app for live updates regarding platform numbers.

By car

The A9 motorway connects Erlangen to Leipzig (North), the A73 motorway connects Erlangen to Nuremberg (South) and the A3 motorway connects Erlangen to Frankfurt (West).

Getting around Erlangen

Everyone should have access to Google Maps via their mobile phone. The centre of Erlangen is given in detail on the map. Walking distance from the Erlangen Hauptbahnhof to the Zeitwohnhaus Hotel is around 12 minutes.

City transportation in Erlangen proper and the wider Erlangen area consists of railway and bus services. Local public transport consists primarily of buses, and to a lesser extent the S-Bahn (which has only four stops in the city area). Erlangen is part of the VGN (Verkehrsverbund Großraum Nürnberg), a public transport association for the Nuremberg metropolitan area, and several buses operate within the city centre and surrounding areas.

Erlangen's main railway station has regular services to, or towards, a number of major cities in Germany, including Leipzig, Berlin and Hamburg. The city's bus station, or Busbahnhof, has frequent services to surrounding German cities, as well as international services for those who wish to travel to surrounding countries such as Austria and Switzerland.

As in many German cities, cycling in Erlangen is very popular, and consequently a large proportion of locals cycle to work. Bicycles can be rented from any local bicycle shop or at the Erlangen Hauptbahnhof. A large part of Erlangen was built with the Huguenot refugees from France in mind, well before the advent of the car. Therefore, a number of Erlangen streets are too narrow for two cars to pass side by side. Almost all of these one-way streets can be entered by bike both ways. As a result, cycling usually makes for the shortest trip length by distance.

Getting to Chemikum from Erlangen:

To get to Chemikum from Erlangen, it is advisable to take the bus.

The number 20 runs from Henkestraße, which is a 5-minute walk from the Zeitwohnhaus Hotel. The departure bus stop is Erlangen Stubenlohstraße, and you should get off at Erlangen Nikolaus-Fiebiger-Straße. The journey to Chemikum takes around 18 minutes.

You can purchase tickets from ticket vending machines or on the bus.

Social Programme

There will be a trip to Nuremberg on Thursday 10 October at 13:00, a guided tour of Nuremberg at 15:00 and network dinner in Erlangen at 18:30.

13.00 Meet at bus stop Nikolaus-Fiebiger-Straße (in front of Chemikum)

13.07-13.20 Bus from Erlangen Chemikum – Erlangen Arcaden (200 m walk to Hauptbahnhof)

13.42-14.09 Train from Erlangen Hauptbahnhof (S1, platform 3) – Nuremberg Hauptbahnhof

15.00-17.00 Guided tour of Nuremberg (two groups, each one with a Tourist guide) – meeting point at Tourist Information at Hauptmarkt in Nuremberg

17.40-17:54 Train from Nuremberg Hauptbahnhof (RE 4994, platform 4) – Erlangen Hauptbahnhof

18:30 Dinner at Alter Simpl, Bohlenplatz 2, 91054 Erlangen (www.alter-simpl.com)

Erlangen

Erlangen is a Middle Franconian city in Bavaria, Germany. It is the smallest of the eight major cities in Bavaria and has approximately 114,000 inhabitants. Together with Nuremberg, Fürth and Schwabach, Erlangen forms one of the three metropolises in Bavaria. With the surrounding area, these cities make up the European Metropolitan Region of Nuremberg, one of 11 metropolitan areas in Germany. The cities of Nuremberg, Fürth and Erlangen also form a triangle on a map, which represents the heartland of the Nuremberg conurbation.

Erlangen is first mentioned by name in a document from 1002. The exact location of the Erlangen mentioned, as well as the origin of its name remain unclear, but the document suggests the building of a settlement around this time. The new settlement was built in a triangle, today bordered by the streets Hauptstraße, Schulstraße and Lazarettstraße, on a flooding-free sand dune. Fifteen years later, in 1017, Henry II confirmed an exchange agreement, through which Erlangen and other territories were given to the newly founded Bishopric of Bamberg, where it remained until 1361. In December 1361, Emperor Charles IV bought "the village Erlangen including all rights, benefits and belongings."

After years of suffering the effects of wars in the wider area, as well as the great fire of 1706, Erlangen prospered. In 1792, Erlangen and the Principality of Bayreuth became part of the Kingdom of Prussia. Following Prussia's defeat by Napoleon at the Battle of Jena-Auerstedt, the two principalities were brought under French rule as a province. In 1810, the principality of Bayreuth was sold to the allied kingdom of Bavaria for 15 million francs. In 1812, the old town and the new town were united to form one town, which received the name "Erlangen".

In the period that followed, the city and its infrastructure were rapidly expanded, and since the Second World War, which saw 4.8% of Erlangen destroyed by Allied bombing, the city has emerged as a key location, particularly because of its university, Friedrich–Alexander University Erlangen–Nürnberg. As of 2019, the university has almost 39,000 registered students, almost 26,000 of whom study at the Erlangen campus. Students therefore make up almost 25% of the population of Erlangen and make a major contribution to the local economy, while the university employs several thousand people. The other major employer in the city is the Siemens technology group. It is estimated that roughly one third of the city population are involved with the university in some capacity, while another third work for Siemens.

Every year, the city attracts a large number of tourists due to the Bergkirchweih, an annual beer festival, similar to Oktoberfest in Munich but on a smaller scale. It takes place during the twelve days before and after Pentecost (i.e. 49 days after Easter). This period is called the "fifth season" by the locals. Beer is served at wooden tables in one-litre stoneware jugs under the trees of the "Berg", a small, craggy, and wooded hill with old caves (beer cellars) owned by local breweries. The cellars extend for 21 km (14 miles) throughout the "Berg" and maintain a constant cool underground temperature. Until Carl von Linde invented the electric refrigerator in 1871, this was considered to be the largest refrigerator in Southern Germany. The beer festival draws more than one million visitors annually. It features carnival rides, food stalls featuring most Franconian dishes, including bratwurst, suckling pig, roasted almonds, and giant pretzels.

Climate and weather

In autumn/winter, temperatures vary between 4 and 14°C, and the weather generally alternates between rain and sunshine. You can check the forecast here:
https://www.accuweather.com/en/de/erlangen/91054/weather-forecast/167553

Electricity

Germany's 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 emergency number for fire services and medical assistance in Germany. The emergency number for the police is 110. The average time to answer a 112 call is 9 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 Germany: http://ec.europa.eu/social/main.jsp?catId=559

Telephone

The international access code for Germany is +49.

Time Zone

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

Tipping

In restaurants in Germany, 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 you are 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 Germany.

Although a service charge is also included in hotel, taxi, bar, and café bills, Germans 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

Goethestraße 21a
91054 Erlangen, Germany
E-mail: tourist@etm-er.de
Tel: +49 9131 8951-0
https://www.erlangen.info

Opening Hours

Monday to Friday 09:00 to 12:30 and 13:00 to 16:00
Closed at weekends

Appendix 4 – Erlangen Map

You can download this version of the map: https://www.vgn.de/media/stadtplan-erlangen.pdf

Appendix 5 - Contact Details

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CORE Social Platforms

We wish you a pleasant stay in Erlangen!

www.coreitn.eu