Training Overview

The training part was at the base of the success of PALLADIUM. The training program was developed in agreement to what is reported in the contract (Annex I). A total of **17** Young Researchers (corresponding to **266.5** person-months) were trained inside the Network. Their training consisted not only in the scientific part, but also in gaining complementary skills, such as in learning the language of their hosting Country, in giving oral presentations, in recognizing when the grasp of obtained results were sufficient to justify a publication, in writing a publication and in managing their research project and their secondments in another Network Team.

Training in specialized techniques:

- Synthesis of air- and moisture-sensitive ligands and organometallic compounds using vacuum lines or glove-box techniques at **all the Teams**;
- Use of spectrometry facilities (IR, NMR, UV/Vis., GC, GC/MS) at **all the Teams**;
- Use of X-ray diffractometer at **Teams UNITS, ULP**;
- Use of special NMR techniques, like high-pressure NMR at **Teams UAMSK, CNR.ICCOM**, and Pulsed-Gradient Spin-Echo (PGSE) diffusion measurements at **Team ETHZ**;
- Catalytic tests using high pressure reactors at **Teams UNITS, TU/e, CNR.ICCOM**, **URV, ULP, ETHZ, TU/e**;
- Kinetic studies using multivessels parallel reactor at **Team TU/e**;
- Use of MALDI-TOF mass spectrometry at **Team UNITS** and at **Team TU/e**;

Complementary skills:

- All the Young Researchers present in the Network gave an oral presentation at the Network Meetings where they participated;
- Use of available chemical databases, such as Beilstein *on line*, Science Citation Index, Cambridge Structural Database, SciFinder.
- All the Young Researchers have been stimulated to manage their own projects, to have contacts with other Network members.

Secondments. The mobility of Young Researchers inside PALLADIUM was ensured by their secondments to another Network Team for short periods of time. The information related to these secondments are reported in Table 7.

Table 7. Secondments of Young Researchers during the overall Network lifetime.

Name	Team	Hosting Team	Length	Training Activity
Eduardo Garcia	CNR.ICCOM	URV	3 weeks October 2004	Ligands synthesis
Jérôme Durand	UNITS	DSM Research Laboratory, Geelen, NL	3 weeks October 2003	Catalysis, training on the use of the 96 batches multireactor
Jérôme Durand	UNITS	TU/e	3 weeks November 2004	Kinetic measurements, use of multivessels parallel reactor
Maria Caporali	TU/e	URV	4 weeks April 2005	Catalysts synthesis and catalysis
Sébastien Parisel	CNR.ICCOM	UNITS	3 weeks March 2005	operando NMR studies
Magno Agostinho	ULP	UAMSK	1 week November 2004	Reaction monitoring through in-situ high pressure NMR
Antonio Bella	URV	UNITS	4 weeks January 2005	Terpolymerization, catalytic experiments and NMR studies

The benefit that the Young Researchers received from being part of the Network derives from the possibility to work in an International contest facing different approaches to the research depending on the chemical school of the different Universities. This International contest was practically developed at the Network Meetings, by mutual visits and, in particular, through the secondments. Three examples of secondments are briefly reported below.

- *Dr. Jérôme Durand (Post doc at **UNITS Team**)* spent three weeks at **TU/e Team**. He worked on a research project jointly developed between **UNITS** and **TU/e Teams**. The **UNITS Team** received some ligands synthesized at **TU/e Team**. Dr. Durand used these ligands for the synthesis of the corresponding palladium complexes. With these complexes he performed some preliminary catalytic experiments, always in the laboratories of **UNITS Team**. The preliminary promising results obtained prompted him to study the system in more detail, in particular by carrying out some kinetic investigations. To perform this analysis he used the multivessel reactor present at **TU/e Team**. He was trained to the use of this instrument by Dr. Christian Müller and by Dr. Maria Caporali (who was one of the Young Researchers of PALLADIUM). The success of the collaboration is demonstrated by the publication N° 2 listed at point **A.2**, in which both Young Researchers are involved as co-authors.
- *Dr. Maria Caporali (Post doc at **TU/e Team**)* spent four weeks at **URV Team**. She worked on a research project jointly developed between **URV** and **TU/e Teams**. Dr. Caporali, working at **TU/e Team**, synthesized some ligands tailored for the methoxycarbonylation of styrene catalyzed by palladium complexes. Then, she moved to the **URV Team** laboratories to carry out the synthesis and characterization of the corresponding palladium complexes and, afterward, to test them as catalysts for the designed reaction. During the period at **URV Team** she was tutored by Dr. Ester Guiu (who was one of the Young Researchers of PALLADIUM). The success of the collaboration is demonstrated by the publication N° 1 listed at point **A.2**, in which both Young Researchers are involved as co-authors.
- *Mr. Magno Agostinho (Pre doc at **ULP Team**)* spent one week at **UAMSK Team**. During his time inside PALLADIUM, Mr. Agostinho has developed new series of P-N ligands and has studied their coordination chemistry to palladium as well as their reactivity toward the monomers of the copolymerization reaction. In order to model as much as possible the copolymerization reaction conditions, in particular the high pressure of carbon monoxide or of ethylene (the two comonomers of the reaction), he spent one week at the laboratories of **UAMSK Team** that are equipped with NMR spectrometers with the facility required for performing *in situ* NMR experiments under high pressure. During his time at **UAMSK Team** he was tutored by Dr. Jan Ernsting, the responsible for the NMR instrumentation. The results of this work are reported in the Ph. D. thesis of Mr Agostinho.

The achievements of the training received by the Young Researchers inside PALLADIUM are summarized in Table 8, together with the indication of the job position covered by the Young Researchers once they completed their appointment inside the Network.

Table 8. Overview of the achievements of the training received by the Young Researchers inside PALLADIUM.

Name	Person-months[a]	Network Team	Meetings[b]	Conferences	Publications[c]	Secondments	Job position[d]
Sheba Bergman	2	UNITS	1		1		Post doc at MIT (Boston, US)
Elisa Stabon	6	URV					Reckittbenckiser (I)
Andrei Banu	5	ULP			1		Industry in Roumania
Eduardo Garcia	10	CNR.ICCOM	4	2	3	1	PhD student (S)
Magno Agostinho	37	ULP	6	4	5	1	[e]
Alexander Schätz	5	UNITS	2		1		PhD student (D)
Jérôme Durand	36	UNITS	8	3	8	2	Post doc at University in Toulouse (F)
Maria Rosa Axet	6	UNITS	1	1	4		Post doc at CNRS in Toulouse (F)
Michael Eberhard	19	UAMSK	4	2	2		European Patent Office (NL)
Michela Fusco	10	UAMSK	2	1	1		Akzo Nobel (NL)
Maria Caporali	26	TU/e	5	5	3	1	Syncon (NL)
Ester Guiu	6.5	TU/e	3	2	1		Post doc at….
Sebastien Parisel	24	CNR.ICCOM	4	1	4	1	Johnson Matthey (UK)
Anna Maria Segarra	12	CNR.ICCOM	1	1	2		Post doc at CNR.ICCOM (I)
Antonio Bella	24	URV	5	2	2	1	Post doc at University of Edinburgh
Cyril Godard	12	URV	2	2	2		Post doc at URV (S)
Doina Sirbu	26	ETHZ	3	1	2		????

[a]Person-months spent inside the Network.
[b]Meetings includes Network meetings as well as COST meetings.
[c]Both published as well as in press/submitted/in preparation publications are included.
[d]Place of working after the appointment inside the Network.
[e]He is at ULP Team to complete his PhD. In January he will be as Post doc in Japan.