UNIVERSITY of GLASGOW

ADVance Adenoviruses as clinical treatments
Marie Curie Initial Training Network Contract n° FP7-290082

http://www.gla.ac.uk/researchinstitutes/icams/postgraduateresearchopportunities/mariecurieitnadvance/

ADVance Newsletter n° 1

Summary of this issue:

Welcome of the Coordinator

Dear All,

A warm welcome to the first newsletter from ADVance. To all ER and ESRs, I also welcome you to the project and wish you are very happy and rewarding training experience. We are very excited about the opportunities this project will give to you, as well as new opportunities for the scientific groups to work together on both basic and translational projects relating to adenoviruses.
This newsletter brings you important information relating to the forthcoming first training event in Zurich, organized by Urs Greber and colleagues. I look forward to this event as it is the first opportunity for all PIs and trainees to come together. Our visiting researcher, Glen Nemerow, will also be attending and will provide an excellent overview of his research and help with the wider training offered in this event. Further, this newsletter also describes the history and role of EASCO, our associate partner responsible for generic skills training in ADVance. Mauro Mezzina is leading this. Please read the details within.

I look forward to meeting you for important interactions and discussions in Zurich in March.

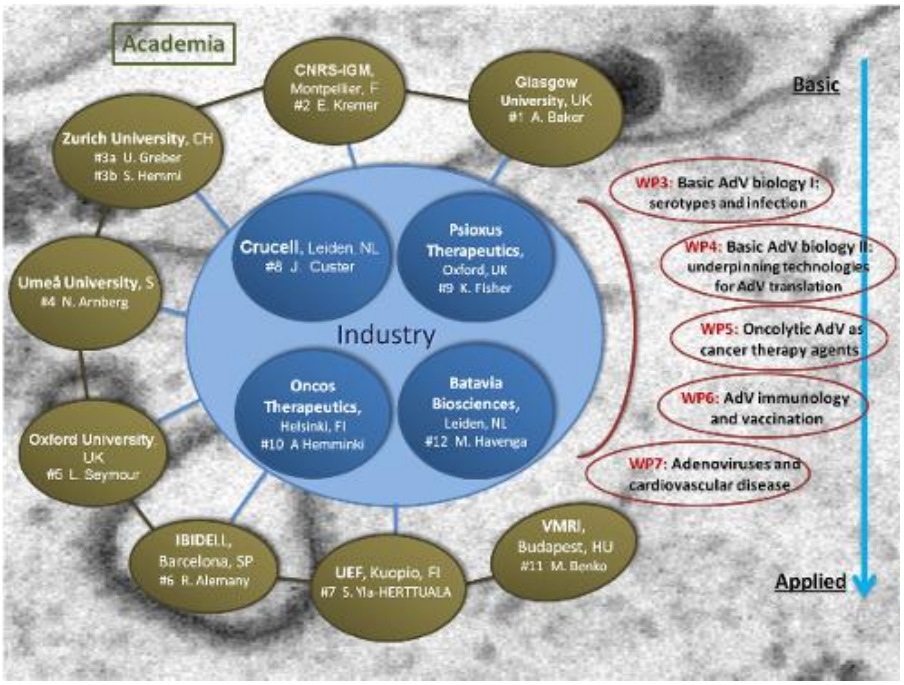
With warm regards,

Andy

The recruited researchers

The ADVance project has recruited **12 Early Stage Researchers** (ESR, i.e. PhD students) and **3 Experienced Researchers** (ER, i.e. researchers holding a doctorate or having obtained the degree entitling them to embark on a doctorate at least 4 years before the date of recruitment) for tenures varying from 12 to 36 months. One more ER is under recruitment at the CRUCELL Holland CV in Leiden (NL).

These recruited researchers will develop **16 research projects** axed around the five research work packages of the ADVance research program, as drawn below:



Scheme of the ADVance research program. Five main approaches will be developed, organized in work-packages (WP) as indicated in the figure. Each approach involves 3-4 individual research projects where the ESRs and the ERs are involved. *More information on the work description is available in the page the ADVance website describing the seven topics and the partners who are involved in each of them at* *http://www.gla.ac.uk/researchinstitutes/icams/postgraduateresearchopportunities/mariecurieitnadvance/advanceresearch/*

The ESRs and ERs have been recruited according to the criterions mainly of the scientific quality of their application and their motivation to embark on or to develop further their career in the research of adenoviruses (AdV) and their application in different domains of interest for health and other commercial exploitations.

	NETWORK PARTNER	ESR	ESR No.	START DATE	E-MAIL ADDRESS	ER	ER No.	START DATE	E-MAIL ADDRESS
1	UGLA (UK)	Estrella Lopez Gordo	1	01.10.12	l.estrella.1@research.gla.ac.uk	Raquel Garcia	1	01.10.12	raquel.garcia@glasgow.ac.uk
2	CNRS (F)	Karsten Eichholzz	2	15.09.12	karsten.eichholz@igmm.cnrs.fr				
3	UZH (CH)	Nicole Stichling	3	01.08.12	nicole.stichling@uzh.ch				
		Rodinde Hendrickx	4	01.09.12	rodindehendrickx@hotmail.com				
4	UMEA (S)	Anandi Rajan	5	23.08.12	Anandi.rajan@climi.umu.se				
		Naresh Chandra	6	13.08.12	Naresh.chandra@climi.umu.se				
5	UOXO (UK)	Jorien Koelen	7	01.05.12	jorien.koelen@keble.ox.ac.uk				
6	IDIBELL (SP)	Carlos Alberto Fajardo	8	21.11.12	cfajardo@idibell.cat				
7	UEF (FI)	Nicholas Downes	9	01.08.12	nicholas.downes@uef.fi.				
8	CRUCELL (NL)					Dragomira Majhen	2		dmajhen@irb.hr
							3		To be recruited
9	PSIOXUS (UK)	Hugo Calderón	10	07.01.13	hugo.calderon@psioxus.com				
10	ONCOS (FI)	Lukasz Kuryk	11	15.11.12	lukaszkuryk@gmail.com				
11	VMRI (HU)	Iva Podgorski	12	1.10.12	ivapodgorski@gmail.com				
12	BATAVIA (NL)					Agnieszka Lipiec	4	01.01.13	a.lipiec@bataviabioservices.com

In the two sections below, the profiles of the 15 recruited researchers are presented for the ESRs (12 fellows) and ERs (3 fellows), respectively, according to the table above. A 16th fellow is still under recruitment in CRUCELL partner in Leiden.

Early Stage Researchers

1. Estrella LOPEZ GORDO

Partner: **UGLA**, Glasgow email: ***l.estrella.1@research.gla.ac.uk***

age: 23 nationality: Spain start date: 01/10/2012

During the academic years in Universitat Autònoma de Barcelona, I completed my Bachelor's degree in Biotechnology, I did internships in hospitals and institutions related with Biomedicine. In order to gain more academic experience, I got a collaboration scholarship to take part in a gene therapy project based on the generation of a whole family of different lengths helper-dependent adenoviruses for therapeutic applications, in Centro de Biotecnología Animal y de Terapia Génica (CBATEG) belonging UAB Campus. It was so rewarding that I decided to start the master in Biomedical Research in Universitat Pompeu Fabra (Barcelona) and keep on this research field. My work was focused in developing a production protocol for the chimeric helper-dependent Ad5/40s in suspension cultures in order to obtain concentrated and defined preparations for future clinical applications. I am currently performing my PhD in Medicine and Therapeutics in the Institute of Cardiovascular and Medical Sciences (Glasgow) designing strategies in order to generate new tropism-modified adenoviral vectors. During the PhD I expect to be able to improve my knowledge in adenoviral vectors and all the techniques involved in their engineering and manipulation. Therefore, I am very enthusiastic in performing this research in the Glasgow Cardiovascular Research Centre.

Description of project In order to increase the available tissue-specific adenoviral gene transfer vectors, I am currently engineering the Ad5 by introducing heterologous peptides that home to the *in vivo* target tissues, in the HI loop of the fiber knob domain. Moreover, we are performing our studies on an Ad5 carrying mutations that allow its de-targeting from the liver, the native target tissue for Ad5. Thus, we aim to generate a range of tropism-modified adenoviral vectors that can be applied for gene therapy purposes.

Career perspectives The projects I have worked on have been specifically focused in viral vectors as vehicles for gene therapy and they have given me experience in the biomedical field, where I would like to focus my future research. Once I complete my PhD, I would like to carry out future research in a pos-doc position in order to extend my experience and to contribute with new knowledge to the biomedical field, focusing particularly in adenoviral vectors for gene therapy applications.

2. Karsten EICHHOLZZ

Partner: **CNRS**, Montpellier email: ***karsten.eichholz@igmm.cnrs.fr***

age: 28 nationality: Germany start date: 15/09/2012

Education During my studies at the University of Bremen I obtained a Bachelor's degree in biology and chemistry followed by a Master's in biochemistry and molecular biology. I did research internships (each lasting 3 months) in different fields such as glyco- and protein biochemistry, neurobiochemistry and molecular ecology. I worked as a student research assistant in different laboratories (>3 years).
For my master thesis, I had the opportunity to work at the Alfred Wegener Institute for Polar and Marine research in 2011 and stayed a few more month to finish my first publication on the molecular evolution of polyketide synthases in marine dinoflagellates (doi:10.1371/journal.pone.0048624).

Always curious, I accepted a PhD position in a different research field at the Institut de Génétique Moléculaire de Montpellier and ADVance. In the group of Dr. Eric Kremer I work on immune complex induced maturation of dendritic cells and the downstream interaction of these cells with other parts of the immune system.
In addition to my studies, I have always been interested in making music. I won a prize as a band member, in which we participated in a European exchange program for young musicians in 2010.

Description of project Ad5 has a high seroprevalence and is often used as a vector for vaccination and gene therapy. Recent findings of the Kremer lab have shown that replication-defective Ad5 opsonized with immunglobulins triggers several innate immune sensors in dendritic cells and induce their maturation, whereas the virus alone does not.
Understanding the initial activation of dendritic cells and the downstream interaction of these cells with other parts of the immune system e.g. B Lymphocytes will be a major part of my project. We will address these questions mainly in human primary cells to as clinically relevant as possible.
My work may improve the development of adenoviral vaccine strategies shaping the immune respsonse towards a cellular or humoral adaptive response as desired. In addition, understanding the human immune response of adenoviral vectors could also help to overcome problems in gene therapeutical approaches.

Career perspectives My PhD project started two month ago and at this point I have not decided yet what I would do in the future. I imagine a career in academic research, but also management in the pharmaceutical industry or even to start a formation as a patent attorney. Therefore, I highly appreciate both the opportunity to work in a cutting-edge research in a dynamic field like immunology and to benefit from the career development training in the context of ADVance.

3. Nicole STICHLING

Partner: **UZH,** Zurich email: ***nicole.stichling@uzh.ch***
age: 25 nationality: Germany start date: 01/08/2012

I started my studies in 2005 at the Technical University in Dresden, Germany, where I graduated with a Bachelor of Science in Molecular Biotechnology. For my studies I received a scholarship from the Friedrich-Ebert-Stiftung which demanded not only good academic accomplishments, but extracurricular activities and interest in politics. In my lecture free periods I undertook diverse practical trainings for instance in chemical ecology, cell biology and virology. Also I had the opportunity to participate in the Novartis Biocamp 2009 with an introduction to the industrial sector and a business plan contest.

Foreign nations and other languages had always interested me. Thus I chose to continue my studies at the trinational Ecole Supérieure de Biotechnologie in Strasbourg. There I could develop my knowledge of English and French and was also able to obtain Master degree in Pharmacy in addition to my degree as Diploma-engineer. My diploma thesis work was on autophagy in a fed-batch context. The work was accomplished at the Michael Smith Laboratories in the bioprocess engineering lab of James Piret at the University of British Columbia, Vancouver.

Afterwards, I decided to join the lab of Urs Greber as a PhD student within the Life Sciences Zurich Graduate School where I am working on innate immune sensing mechanisms during Adenovirus entry.

The aim of this thesis is to characterize the entry mechanisms for human adenovirus into macrophages, and determine viral triggers and cellular sensors leading to type I IFN production in these immune cells. For this, we will employ high-throughput-fluorescence microscopy, electron microscopy, siRNA-induced knockdown of host factors and conventional and superresolution confocal fluorescence microscopy. Using recently published methods to quantify virus binding to cells and uncoating, we will focus on the question how virus trafficking is linked to innate immunity-triggered IFN responses.

I feel very thrilled doing research in a broad, vibrant Adenovirus network at the borders of immunology and cell biology. Within this very fascinating hub of ESRs and ERs from an academic and industrial setting I expect to get manifold insights on Adenovirus-based research. I am looking forward to interacting with people from a multicultural background and also gain complementary skills that will prove useful for later steps in my scientific career.

4. Rodinde HENDRICKX

Partner: **UZH,** Zurich | email: ***rodindehendrickx@hotmail.com***

age: 23 | nationality: Netherlands | start date: 01/09/2012

In 2007 I started the study Life Science and Technology at both the Technical University of Delft and Leiden University (The Netherlands) and I obtained my master degree with a specialization in Research and Development in May 2012. In September 2012 I joined the group of Dr. Silvio Hemmi at the University of Zürich to start my doctoral studies on Mouse Adenovirus (MAdV).

The aim of the project is to characterize the biology of MAdV and to generate oncolytic viruses for genetherapy purposes.

Despite their initial isolation in 1960s Mouse Adenovirus (MAdV1 and MAdV2) biology is only poorly understood, as is also the case for the recently isolated third strain of Mouse Adenovirus (MAdV3). Identification of the receptor(s) involved in their entry-pathway and characterization of the receptor tropism will be my primary focus.

For the study of immune response and pathogenesis of human adenovirus (HAdV) infection various animal models have been used (a.o. cotton rat, hamster and primates). All these models have their shortcomings as the replication of HAdV is impaired in all animal models. MAdV is suggested to be a better model for AdV infection studies as it can be studied in its natural host. Development of oncolytic vectors will allow testing of armed vectors in syngeneic tumor models.Additionally, the mouse models can be used for drug-targeting studies.

The combined information from both studies will contribute to a better understanding of Mouse Adenovirus in general.

During my studies I discovered how exciting science is and I knew I wanted to continue solving the questions about how cellular life is organized and functions. Although there are a lot of hurdles yet to overcome during my PhD, obtaining scientific knowledge and finding the answers to the questions, or generating more questions from the experimental results is something that makes the scientific environment so thrilling. I hope that in my future career I can work on topics that will help the scientific community to understand life a little bit better.

5. Anandi RAJAN

Partner: **UMEA,** Umeå | email: ***anandi.rajan@climi.umu.se***

age: 24 | nationality: India | start date: 23/08/2012

My key skills are:

- **Tissue culture techniques:** Maintenance of **HEK-293T, MDCK, BHK-21**, **Vero** and **HCT-116** cell lines, propagation of viruses in cell cultures, estimation of virus yields by TCID50, live cell experiments (FRAP and acceptor photo-bleaching FRET)
- **Molecular Biology techniques:** Growth & preparation of competent cells, molecular cloning, agarose gel electrophoresis, RNA-PAGE, RNA and DNA extraction, PCR (RT-PCR, multiplex PCR, real time PCR), Sequencing for mutant analysis.

- **Biochemical techniques:** SDS-PAGE, Western Blot and detection by chemiluminescence, immunoprecipitation, GST-pulldown assay
- **Immunological techniques:** Lymphocyte separation, mitogen stimulation, immune-electrophoresis, flow-cytometry (FACS), ELISA, ELISPOT, complement fixation test, plaque reduction neutralization test, immune-fluorescence assay, sensitized emission FRET, haemagglutination and haemagglutination inhibition tests

Title of my project- Identifying binding partners (eg.: integrins or other cellular receptors/co-receptors) for human adenovirus (Ad) 40 and 41 penton base proteins, and characterizing their roles in the Ad40/41 life cycle.

Background - Human adenoviruses cause respiratory illnesses, epidemic conjunctivitis and infantile gastroenteritis. Out of the 57 known types of Ad40, Ad41 and Ad52 are known to be associated with gastroenteritis. These viruses cause enteric infections in infants worldwide and are third only to infections caused by rotaviruses and caliciviruses.

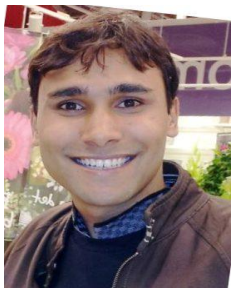
Adenoviruses use various receptors for attachment onto the different host cells. CAR, sialic acid, coagulation factors IX and X, lactoferrin, CD46 and heparan sulphate are some of the receptors which the fiber knob or hexon proteins (components of the capsid) bind for direct or indirect cellular attachment. The penton base protein (another component of the capsid) is said to be responsible for the internalization of the virus into the host cell. An Arg-Gly-Asp (RGD) motif on the penton base is responsible for interaction with integrins and this interaction mediates internalization.

A unique feature of the enteric adenoviruses 40 and 41 is that they do not have this RGD motif on their penton base. Thus, the aim of this project would be to identify the interacting partners of the penton base of Ad40 and Ad41. Once binding partners are known, we could also check if adenoviruses from other species have a common receptor/mechanism for entry.

6. Naresh CHANDRA

Partner: **UMEA,** Umeå email: ***Naresh.chandra@climi.umu.se***

age: 25 nationality: India start date: 13/08/2012



I have completed my master's in Biotechnology at the Department of Biotechnology, Indian Institute of Technology (IIT) Roorkee, India. Since my childhood I have always had keen interest in science particularly biological sciences. Furthermore, my higher education prompted me to make my career in the field of Virology. My penchant towards this field grew up logistically during my master's summer internship and dissertation. I have completed my master's summer intern-ship at the Department of Microbiology and Cell Biology, Indian Institute of Science (IISc.) Bangalore. My work there included "Cloning and expression of frame-shifted NS1′ (Non Structural 1 Prime) gene of Japanese Encephalitis Virus (JEV)". There, I have also exposed myself with the handling of animal cell culture which includes isolation of Bone-Marrow-Derived Murine Dendritic Cells (MDC) from mice bone marrow. During my master's dissertation I was involved in the research examining as a major project, "Cloning, expression, purification and crystallization of nsP2 protease domain of Alpha viruses development of luciferase and β-galactosidase mediated protease specific assay" and a minor project, "Structural and functional analysis of NS5 protein (RNA dependent RNA polymerase (RdRP)) from Japanese encephalitis virus (JEV)".

After completing my master's I have joined Niklas Arnberg's group here at Division of virology, Umeå University, as a doctoral student. As a doctoral student I have been assigned with a project entitled "Identification and characterization of soluble components that regulate adenovirus tropism". Human adenoviruses (Ads) are relatively promiscuous in their ability to infect a wide range of cells and tissues. Sixty human Ad types have been identified and classified into seven species (A-G) on

the basis of serology and DNA homology. Different serotypes from different Ad species cause diverse cellular infections or tropism. Members from group C and D specifically, cause respiratory and/or ocular infections respectively. Since there are no vaccines or antiviral drugs available, identification of targets for antiviral treatment is highly desirable.

Recent development in the identification of cellular Ad receptors shows that these viruses use receptors such as the coxsackie and adenovirus receptor (CAR), and sialic acid monosacharides, which are usually expressed by a broad range of host cells. This makes us question, which factors are responsible for Ad tropism. In this study, we would like to explore the role of soluble components from different body fluid in Ad tropism. In order to identify soluble components, collection of body fluid followed by glycan array/ mucin array and proteomics approaches will be performed. Validation of the in vitro function of the identified molecules will be carried out by binding, infection and knob binding experiments. Further, characterization and study of molecular interactions will be examined by X-ray crystallography and surface plasmon resonance. It has been shown that terminal sialic acid-containing glycans, corresponding to the glycans present in the GD1a ganglioside, serve as a cellular receptor for adenoviruses causing epidemic keratoconjunctivitis (EKC), including adenovirus type 37 (Ad37). Further, it would be fascinating to analyze the Ad37 fiber knob and it's glycan binding specificity with other terminal sialic acid containing glycans. This study will explore if there are additional glycans that may function as receptors for Ad37.

These studies would be helpful to explain the tropism of Ads and further can be implicated to design sialic acid-containing antiviral drugs. Moreover, Ads are commonly used as viral vectors for cancer and gene therapy, so identification of such soluble components that interact with Ads, and characterization of corresponding interactions will be useful to design efficient Ad based vectors and would also be useful to explore new evolving mechanism of host pathogen interactions.

To satisfy my desire of understanding the host-viral interaction and its regulation, I have tried to work and understand each of these aspects during my master's. Now, I have an opportunity to fulfill my ambition as a doctoral student. After the doctoral study, I would like to continue my research with the potential post doc position, which will give me a lot of opportunities again to understand the mystery of viruses and to interact with researcher working in this field and will surely pave a path to me to become a world expert in the field of Virology. I have also decided to convey my knowledge and experiences to coming generation by being an innovative researcher and a motivated teacher which will actuate enthusiastic young generation to develop effective drugs or vaccines against life threatening diseases.

7. Jorien KOELEN

Partner: **UOXFO,** Oxford email: ***jorien.koelen@keble.ox.ac.uk***

age: 25 nationality: Netherlands start date: 01/05/2012

After finishing secondary school (VWO), I choose to study pharmacy at Utrecht University, the Netherlands. Upon finishing my Bachelor's, I decided to do a Master's in Drug Innovation at Utrecht University as I was most interested in experimental research. As part of this Master's degree I did two one year internships. During the first research project, I worked on the molecular mechanisms underlying epileptogenesis at the Rudolf Magnus Instititue for Neuroscience, at Utrecht Universtity. Subsequently, I did an internship on glioblastoma at Harvard Medical School/Massachusetts General Hospital. I worked on several different projects during my year in the USA, including drug screening and a suicide gene therapy project.

I really enjoyed working on gene therapy for glioblastoma and therefore I applied to the Len Seymour laboratory at the University of Oxford, United Kingdom. My current PhD project is aimed at

overcoming immunosuppression in the tumour microenvironment. By expressing pro-inflammatory within the tumour, I hope to induce an immune response against the tumour.

After my PhD I would like to continue cancer research at a university or research institute.

8. Carlos Alberto FAJARDO

Partner: **IBIDELL,** Barcelosa email: ***cfajardo@idibell.cat***

age: 26 nationality: Colombia start date: 21/11/2012

Education and Research experience

- M.Sc. in Molecular Biosciences with a Major in Cancer Biology
University of Heidelberg and German Cancer Research Center (DKFZ), Germany
- B.Sc. in Biology and Microbiology (double major) ,Universidad de los Andes, Bogotá, Colombia.
- Master thesis (Advisor: Dr. Dirk Nettelbeck)

Research area: transductional targeting of Adenoviruses

Group Oncolytic Adenoviruses, German Cancer Research Center (DKFZ), Heidelberg, Germany

- Bachelor thesis.

Research area: *Helicobacter pylori*-induced carcinogenesis

Cancer Biology Research Group, Instituto Nacional de Cancerología, Bogotá, Colombia

Research interests and career perspectives My research interests focus on the development of oncolytic adenoviruses as novel anticancer therapies. The ADVance program represents a unique opportunity for me to deepen my knowledge in adenoviruses and to gain skills that will support the development of my project at the IDIBELL. Furthermore, I see the ADVance program as the perfect starting point in my attempt to continue my career in translational research, linking the academia and industry to contribute in the development of novel cancer therapeutics.

Project description Replication-competent adenoviruses have gained considerable attention as anticancer drugs, as they can be easily modified to generate oncolytic viruses which selectively replicate in tumor cells. Despite the potential of oncolytic adenoviruses for cancer therapy, clinical trials with adenoviruses have suggested that further improvements on cytotoxicity and on the modulation of the antiviral and antitumor immune responses will be crucial for their success in the clinics. With this in mind, my project within the framework of the ADVance program will involve the generation of oncolytic adenoviruses engineered to express: (i) cytotoxic molecules to induce a bystander killing of cancer cells and (ii) immunomodulatory molecules to favor the antitumor rather than the antiviral immune responses.

9. Nicholas DOWNES

Partner: **UEF,** Kuopio email: ***nicholas.downes@uef.fi***

age: 24 nationality: United Kingdom start date: 01/08/2012

I started my PhD in January 2012 after graduating from the University of Surrey during the summer of 2011.

My work consists of performing research focused on epigenetic regulation of target vascular genes by gene transfer using vectors based on non-coding RNAs in models of cardiovascular diseases. Vectors will first be tested in vitro and then analyzed for efficacy and safety in various biochemical, molecular biology and imaging methods in relevant animal models."

For me, the ADvance project creates a unique opportunity to maximise the utility of AdV as a vector and to establish new lines of collaboration for future research and vector optimisation

10. Hugo CALDERON

Partner: **PIOXUS,** Oxford

email: ***hugo.calderon@psioxus.com***

age: 24

nationality: France

start date: 07/01/2013

In 2006 I started my BSc at Autonomous University of Barcelona (Spain) and I obtained my master degree with a specialization in Immunology in September 2012 from the University of Barcelona (Spain). During my BSc project I had my first introduction to adenoviruses thanks to VCN Bioscience (Spain). After that, I decided to stay in the field of adenovirus research. For this reason I did my master degree project at Catalan Institute of Oncology (Spain) at Cancer Virotherapy team, led by Dr. Ramon Alemany.

My project was investigating the interaction of Adenovirus with Human erythrocytes through the CR1 receptor and how that interaction influences *in vivo* bio-distribution (mainly for the hepatic and tumor transduction). Simultaneously, I was doing another project trying to fuse a pro-toxin, activated by the tumor stroma, to a capsid protein in order to increase the oncolytic potency.

The aim of the project is to characterize the binding, uptake and biology of group B adenovirus in the context of cancer.

Much less is known about the group B adenovirus serotype when compared to Ad5. Mechanisms of cell binding and entry remain to be fully elucidated and better knowledge of this will help to develop better approaches for cancer virotherapy.

The project will also look at improving the delivery of adenoviruses in the blood stream. Interactions with blood components have been described as important for the final delivery of virus to tumours. Studies will aim to obtain a better understanding of how group B viruses interact with host proteins and blood components. This work will also focus on evaluating the impact of virus polymer coating on viral distribution, delivery and host immune responses.

Thanks to the opportunities I have had to be involved in applied adenovirus projects I have found how amazing it can be to make discoveries about the complex problems you are trying to solve. Furthermore, when a project or idea has biomedical application it makes you feel that you are doing something important for the society. Cancer has a huge emotional and financial impact for humans, but I personally think cancer virotherapy may have something to say soon about this matter. I would like to be part of the projects and collaborations that work to help cure this illness.

11. Lukasz KURYK

Partner: **ONCOS,** Helsinki

email: ***lukaszkuryk@gmail.com***

age: 26

nationality: Poland

start date: 15/11/2012

I graduated from two majors: Biotechnology and Environmental Protection at the University of Silesia in Poland.

During my studies, I went on exchange in the framework of LLP / Erasmus to Spain where I worked on a research project. During this time, I mastered new research techniques and got acquainted with teamwork in the laboratory.

I also completed an internship at the Institute of Biomedical Sciences (Instituto de Investigaciones Biomédicas "Alberto Sols") in Madrid, where I worked on a

research project for 3 months (cell cultures, plasmid constructs, transfection, western blot, flow cytometry).

In addition, I completed an intersnhip at the Military Institute of Hygiene and Epidemiology in the Department of Microbiology in Warsaw (FISH, PCR, fluorescence microscopy, cultures of bacteria).

I worked at National Institute of Public Health in Department of Virology in Poland (cell cultures, multiplication of viruses, PCR, molecular biology).

I also conducted research project at Robert Koch Institute in Berlin at WHO/EURO Regional Reference Laboratory for Poliomyelitis. Research is focused on sequencing of enteroviruses and phylogenetic analysis (RT-PCR, Real Time PCR, sequencing, molecular typing, serotyping, phylogenetic analysis, cell cultures).

I am experienced in working in research laboratories and I am acquainted with the research instruments and laboratory equipment. I have a good knowledge of English and computer skills.

I am disposable, open, communicative, conscientious and full of optimism. I like to learn and gain new experiences. I can quickly assimilate knowledge and I have no problems with adapting to a new surrounding.

At Oncos under Maria Curie Program I am going to perform research on AdV production and it's optimization.

According career perspectives I belive that in the future thanks to this program I will get professional skills and knowledge thus I will braoden my education level and get satisfactory work.

12. Iva PODGORSKI

Partner: **VMRI,** Budapest

email: ***ivapodgorski@gmail.com***

age: 24

nationality: Croatia

start date: 01/10/2012

In 2007, I finished High School and entered University Undergraduate Programme (molecular biology) at Faculty of Science in Zagreb. In 2010, I obtained the academic title Bachelor of molecular biology, and entered Graduate University Study Programme (molecular biology). During the study programme, I participated in scientific event known as "Night of Biology", and attended Congress of Croatian Genetics with international participation. In 2012, I obtained the academic title Master of Science (M.Sc.) in Molecular Biology and entered Marie Curie Initial Training Network (Adenoviruses as novel clinical treatments, ADVance) for early stage researchers at the Institute for Veterinary Medical Research in Budapest, Hungary. The estimated time spent on the project is three years.

Description of project: finding novel simian and prosimian adenoviruses (AdVs), gaining partial genome sequences from those; genome study of isolated simian AdVs with emphasise on non-essential E3 and E4 region genes, sequencing the whole genome of selected simian AdVs; finding novel rodent AdVs, study of the role of unique E3 and E4 proteins of rodent AdVs; trials to express individual genes of MAdV-2 (and possibly of other rodent AdVs) and to study their possible functions; comparative bioinformatics approaches to reveal differences and to try to understand the functions of E3 and E4 genes; trials to find (or even isolate) MAdV-2 genome variant strains in the environment, estimating their possible diversity; identifying important and applicable genes in fish, reptilian, bird, and mammalian AdVs; finding and sequencing novel animal AdV genomes from hosts belonging to different vertebrate classes and analysing animal AdV genomes for genes with possible application in recombinants HAdVs, identifying the role and applicability of the different fibers in those AdVs; finding novel fiber genes in animal AdVs genes and predicting their possible application in recombinant HAdVs (compared to earlier recombinants based on similar approach); trials to understand the functional differences in the double fibers of animal AdVs.

I started my research work in Budapest on 1st of October 2012. During the first two and half months of my work, I have been learning different molecular techniques used for the isolation, screening and identification of various adenoviruses, and also some bioinformatics approaches.

During or after Marie Curie Initial Training, I would like to apply for a PhD program. I am looking forward to improving my scientific and technical skills as much as I can in these three years of the programme and to get more experience in interpretation of scientific results. In future, I would like to work with university students or other young scientists, helping them in realisation of their goals.

Experienced Researchers

1. Raquel GARCIA

Partner: **UGLA,** Glasgow | email: ***raquel.garcia@glasgow.ac.uk***

age: 32 | nationality: Spain | start date: 01/10/2012

After seven years working on mollecular biology research, I am seeking to develop and gain professional competence in the field of gene therapy in cardiovascular diseases. During the last two years (2010-2012) I was working as Postdoctoral researcher at the university of Cantabria, being involved in a collaborative study with the units of Cardiology and Cardiovascular Surgery at the University Hospital Marqués de Valdecilla, Santander, Spain. The objective was to analyze, with a translational research perspective, the molecular mechanisms underlying myocardial remodeling under pressure overload. I received hands-on training in the following areas:

• Studies on myocardial gene expression and plasmatic biomarkers in patients with aortic stenosis subjected to aortic valve replacement
• Mouse experimental models of myocardial hypertrophy induced by pressure overload
• Gene over-expression and silencing studies in cultured cells (cell lines and primary cultures).

This current position as ER at Marie Curie Initial Training Network : *Adenovirus as clinical treatments* will allow me the opportunity to utilize my background in molecular cardiac pathologies to gain professional competence in the fiel of gene therapy in cardiovascular diseases. Moreover, I will also increase and develop my understanding of adenovirus biology in order to adress different techniques that will drive translational research on adenovirus.

Description of the project. I am enrolled in a multidisciplinary project which will give me the opportunity to develop my understanding of adenovirus biology and trafficking. We are assaying different chemical compounds that increase the transduction of Adv through coagulation factor X. Moreover, we are developing and refining the utility of AdVs using microRNAs in vein graft failure in order to obtain new strategies for the Adv translation into the cardiovascular setting.

Professional objectives. To gain professional competence in the field of gene therapy in cardiovascular diseases utilizing my knowledge and experience of molecular mechanisms involved in cardiac remodelling.

To increase and develop my understanding of adenovirus biology in order to address different techniques that will drive translational research on AdVs

Achieve continuous professional development within treatments in cardiovascular diseases focusing on the needs for the next era for AdV translation into the cardiovascular setting.

To advance in the knowledge of research management and project designing as well as improving my communication and negotiation skills

2. Dragomira MAJHEN Partner: **CRUCELL,** Leiden email: ***dmajhen@irb.hr***

age: 36 nationality: Croatia start date: 15/02/2013

I studied molecular biology at Faculty of Science, University of Zagreb, Croatia from which in November 2008 I obtained my PhD in Natural Sciences, branch of molecular biology and biochemistry. I did my PhD thesis under supervision of dr Andreja Ambriović Ristov, at the Institute Ruđer Bošković, Zagreb, Croatia, working on the subject of retargeted adenoviruses aimed to be used as vectors for cancer gene therapy including studies of basic biology of retargeted adenovirus and interaction between adenovirus transduction efficacy and resistance to cytostatics. In the period from 2010-12 I did postdoctoral stay in the group of dr Karim Benihoud, in CNRS, UMR 8203, Vectorologie et thérapeutiques anti-cancéreuses, Institut de Cancérologie Gustave Roussy, Villejuif, France where I studied cell entry pathway of NGR-retargeted adenovirus. For this research I was awarded two young researchers grants: Gaining Experience Grant, Unity Through Knowledge Fund and Croatian Science Foundation Postdoctoral grant. During my research I stayed several times in UMR 1161Virologie INRA-AFSSA- ENVA, Ecole Nationale Veterinaire Maisons Alfort, France where I worked with dr Jeniffer Richardson and prof Marc Eloit.

In 2012 I entered ADVance program (Adenoviruses as novel clinical treatments) in the frame of Marie Curie Initial Training Network for experienced researchers, in the group of dr Jerome Custers at the Crucell, Holland BV, The Netherlands. Main scope of the project I will be involved in is development of novel Ad serotype vectors and application in vaccination comprising: i) development of human novel serotype gene transfer vectors, ii) in vitro characterization of novel serotype vectors and evaluation of manufacturability, iii) in vivo evaluation of novel serotype vectors and utility for vaccination purposes.

Joining this program and team of dr Custers will be a great opportunity for me to experience another aspect of scientific research, that of pharmaceutically oriented applied research. I am keen to learn new state-of-the-art methodologies and ready to get knowledge of new approaches. I am highly enthusiastic about training components that will be covered in this program, mainly complementary skills, network research and interdisciplinary training. I am looking forward meeting new and exciting people, sharing with them new ideas and establishing contacts that will hopefully lead to successful collaborations in the future.

3. *To be appointed* Partner: **CRUCELL,** Leiden email:

age: nationality: start date:

4. Agnieszka LIPIEC Partner: **BATAVIA,** Leiden email: ***a.lipiec@bataviabioservices.com***

age: 32 nationality: Poland start date: 01/01/2013

In 2005-2006 I conducted a full-time research for my Masters thesis. The main purpose of research was to investigate the humoral and cellular immune responses of rats to oral vaccination with recombinant cysteine protease *Fasciola hepatica* expressed in bacteria (*E.coli*) or plant (*Lactuca sativa)*. During my master study I was selected to participate in the Socrates Erasmus Programme which enabled me to study at Wageningen University and Research Centre in the Netherlands for six

months. The period of my scientific career that I have spent in Wageningen gave me interpersonal context. I have learned how to work effectively with the people of different background and cultures. After graduation I had opportunity to work at Ingenium Pharmaceuticals Company in Munich Germany – in frame of Leonardo da Vinci Programme and to be involved in the project entitled "Practical aspects of biotechnology and biomedicine". Within these several months I have been acquainted with the way science is carried out in industrial environment. Beside the practical application and implementation. I also look at the science from the business perspective. My postgraduate study on drugs registration covered preclinical and clinical aspects of gene therapy medicinal product and enabled me to broaden the valuable knowledge how to transfer the science into business activity. While working as a junior scientist in the Gene Therapy Techniques Group Cell Biology Department in Warsaw Cancer Center I have carried out my PhD project concerning angiogenic AAV viral vectors for cardiomiocytes *in vivo* and *in vitro* and I have taken it through to clinical trials. Personally, I consider the gene therapy as fascinating field of science. I think that participating in such interesting project concerning adenoviruses in clinical treatment will provide me with the specific skills and allow me to work with people who are in the same scientific area and assist me in achieving my long-term career goals.

ADVance training

- **Workshop in Zurich (March 11-22, 2013)**

Course coordinator: Urs Greber

The course will give a complete overview of the scientific and technical aspects dissecting the adenovirus infection in identifying the human host factors involved. The theoretical part will include lectures of the ADVance PIs and external speakers. It will be combined with a course on management of research and tutorials on scientific writing (articles and grant applications), in order to impart to the ESRs/ERs basic transversal complementary skills in addition to the scientific and technical skills. The practical laboratory course will impart basic and advanced technologies by using siRNA reverse transfections and quantification of metabolic/infection state of cells with high throughput approaches, data analyses and data interpretation.

Learning objectives:

1) The student learns to formulate and test a scientific hypothesis based on existing literature.
2) The student receives instructions in 'scientific writing'. He/she learns the salient features of grant writing.
3) The student learns how to carry out an infection experiment at small scale in high throughput mode, and thereby tests the hypothesis.
4) He/she learns aspects of liquid handling and fluorescence imaging.
5) The instructors place particular emphasis on essential experimental controls, positive, negative and background controls.

Specific tasks of the practical laboratory course:

1) Specifically, the student carries out small RNA and small chemical compound interference experiments with cultured cells, infects the cells with human adenovirus serotype 5, and scores the infection efficiency by immunostaining or direct GFP readout.
2) He/she carries out automated fluorescence microscopy, determines the fraction of infected cells in relation to the fraction of viable cells and thereby obtains an estimate of the therapeutic index of the interfering agents.
3) He/she performs infection analyses, generates a raw hit list, and carries out bioinformatics analyses, for example, by taking advantage of pathway clustering and linkage software, such as STRING (http://string.embl.de/).
4) He/she correlates and interprets results from siRNA interference and small chemical interference.
5) The student summarizes hypothesis and results with a brief discussion in a report in the style of a small research paper, also considering relevant literature.

6) He/she practices 'scientific writing' by carrying out specific tasks with selected papers from the literature.

Course program:

2013	***Adenovirus infection biology***	**Greber_Lab_UZH**
Day	***Event***	***Who***
So	Arrival & check into hotel	ER & ESR: 15
March 10	**Individual dinner**	
Mo	**9-9:15: Introduction (UG)**	
March 11	**9:15-15:30 Management course (MM)**	ER & ESR
	12-13: Lunch	
	16-17: Experiments	ER & ESR, instructors
	Arrival of PIs	
	17-19: Tutorial 'Scientific Writing_1' (HS, MS)	ER & ESR
	17-19: Business meeting PIs	PIs, associate partners
	19h: Dinner	ER, ESR, PIs, associate partners
Di	**9-12: Plenary lectures**	**External speakers**
March 12	**12:15-13:30 lunch**	
	13-18: Regular talks	PIs_Advance
	19: Dinner	speakers
Mi	**9-15:45: Experiments**	ER & ESR, instructors
March 13	**16-17: ER/ESR short talks 1 (8+2 min) (UG)**	ER & ESR, instructors
	17:15-19: ER/ESR short talks 2 (8+2 min) (UG)	ER & ESR, instructors
Do	**9-ff: Experiments**	ER & ESR, instructors
March 14	**13-14: Tutorial 'Grant Writing_1' (GN)**	ER & ESR
	Experiments continued	ER & ESR instructors
Fr	**9-ff: Experiments**	
March 15	**Data analyses**	
	13-15: Tutorial image analyses in RNAi screens (ME, PR)	ER & ESR, instructors
Sa	**Data analyses & homework**	
So	**Trip to mountains**	ER & ESR, instructors, ...
Mo	**9-ff: Experiments**	ER & ESR, instructors
March 18	**13-14: Tutorial 'Grant Writing_2' (GN)**	ER & ESR
Di	**9-ff: Experiments**	ER & ESR, instructors
March 19	**Data analyses**	
	17-18: Tutorial 'Scientific Writing_2' (HS, MS)	ER & ESR
Mi	**9-ff: Experiments**	ER & ESR, instructors
March 20	**Data analyses**	
Do	**9-ff: Data analyses & interpretation**	ER & ESR, instructors
March 21		
Fr	**9-ff: Data collection & handing in of report**	ER & ESR, instructors
March 22	**12-14: Wrap up & future steps (UG)**	ER & ESR, instructors
	Departure	ER & ESR

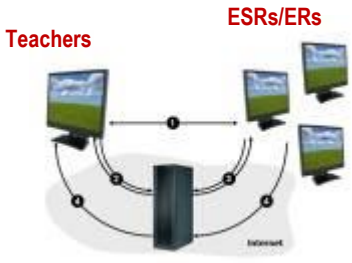
• E-training platform on complementary skills

The ADVance offers, through the associated partner EASCO, a training platform that is **permanently available** for the ESRs and ERs. The platform aims to allow the fellows to translate into concrete career achievements the skills they have acquired during the tutorial courses, such as the management course and the scientific writing sessions, which are scheduled in the event in Zurich, for instance (see the program above).

Therefore, the fellows will benefit of webcasted courses and **individual coaching sessions,** which will allow them to implement/valorize their management skills and career motivation, develop interpersonal resources and communication skills and optimize thus their performances. Such a pedagogic approach will be developed by EASCO teachers who will work in synergy with the PIs and the ADVance coordinator.

Pedagogic approach: an e-platform of individual training, orientation and career follow-up

Method: web-remote training / communication



Content:

- *webcasted courses*
- *interacting with web community*
- *achieving career needs: career plans, writing & oral deliverables*
- *evaluation of the skills: interviews, questionnaires, tests of competences*
- *database: recorded courses, research data, publications*

Tools:

webcasting

chat sessions

All ESRs and ERs are adviced to contact EASCO help desk (contact@easco.org) or Mauro Mezzina (mezzina@easco.org) to start this training. They will not only benefit of training on complementary skills in addition to that delivered in the future events, but they will achieve also some important items for their career, such as scientific writings (abstracts, reports, articles…) and other items indispensable for the future career (CV, motivation letters, grant applications, exercises for job interviews…).

• Information on EASCO associated partner

EASCO is a non-profit association having the mission to update the scientific culture in the field of gene therapy, stem cells and other biotechnologies with new multidisciplinary competences and technological approaches. The EASCO founders, who are researchers with a long experience in this field, have contributed significantly to structuring the research-training ground in Europe during the last decade by organizing several events since 2001 (see http://easco.org/home/?q=node/6). Hence, transfer of knowledge could have made to more than one thousand of researchers from worldwide. Among them, ~150 PhD students and post-docs, who acquired hands-on experience in attending the practical courses since 2002 (on vector engineering, production and

purification, animal cell technologies, *in vitro*/*in vivo* experimentation, vector characterization and quality control…), started their career in this field and asked further training on basic science, technologies and help in managing their projects. Therefore, EASCO founders seized the necessity to enrich the scientific culture of researchers with additional transversal complementary skills that forge the entrepreneurship allowing thus researchers to convert basic knowledge into applications for health, food, environment and other domains of great socio-economical interest.

Hence, new responsibilities emerge for the researchers to become knowledge's entrepreneurs, and new training approaches are necessary thus to perform research as source of economic growth. However, a training approach that combines both scientific with transversal skills has not been developed in the EU universities, which remain still anchored to traditional educational concepts. The difficulty to develop innovative educational programs more adequate for translational research in Europe is associated to two main issues: first, to the absence or poorness of dialogue between academic bodies and industries, which keeps basic and applied science separated from each other. Second, the reduction of public expenses, especially during the last years of economic crysis, discourages foreseeing new educational strategies.

This is the context where EASCO has created in 2007, in order to overcome the above issues by offering a multidisciplinary training program that address thus the needs of Life Science researchers.

Therefore, EASCO develops three kinds of activities:

1: organize **symposiums and workshops** on gene therapy vectors and stem cells to spread scientific and technical skills to researchers. EASCO has organized three international symposiums and practical courses on non-viral and viral vectors in Paris, Evry, (France) and Kuopio (Finland). As described above, the participants in these events benefit from the knowledge and technology transfer on vectorology and related disciplines and start or further develop their career in this domain.

Paris, 14-22 Sep 2007


Evry, 29/06-3/07/2008

Kuopio, 24/08-03/09/2010

2: Develop an educational program on **management skills**, i.e. research management, communication, management and exploitation of the intellectual property, namely. This program involves courses on the above topics coupled with individual coaching on **career development**. We started these courses in 2008 and, so far, we follow over hundred early stage and experienced researchers in any needs of their career (CV, motivation letters, research papers, grant applications, exercises for job interviews…) in a long-life scheme, i.e. during their overall career.

3: EASCO serves individual researchers and institutions in **setting up proposals** to fund research projects and mobility tenures of researchers in the context of the European Commission programs and Marie Curie in particular. So far, EASCO is involved the *ADVance* and *BrainVectors* networks, both involving about twenty laboratories in seven EU countries. EASCO takes care of the preparation of the proposal, the negotiation of the contract, management tasks and of the overall plan of training and dissemination activities. Furthermore, EASCO helps students and post-docs for their mobility projects in preparing Marie Curie fellowship applications. In addition to these activities, some EASCO members work for the Commission as evaluators for Marie Curie, Cooperation and Idea programs, while other members help the EC officers in setting up/optimizing the instruments of the ongoing and future framework programs.

Marie Curie ITN
contract n° 290002

Marie Curie IAPP
contract n° 286071

More information on EASCO (activities, members, statutes, partners) is available at the web site www.easco.org.

Examples of publications on AdVs

The publications (selected from 2010 to 2012) are on general topics on adenoviruses and AdV vectors, or about their use for different gene transfer or vaccination, or technical approaches relevant for the ADVance research projects. The authors belonging to ADVance (PIs, staff members or visiting scientist) are displayed with yellow background.

Year 2010

Crystal structure of human adenovirus at 3.5 A resolution. Reddy VS, Natchiar SK, Stewart PL, Nemerow GR. ***Science*** 2010; 329(5995):1071-5

Adenovirus. (Review). Smith JG, Wiethoff CM, Stewart PL, Nemerow GR. ***Curr Top Microbiol Immunol.*** 2010; 343:195-224.

Tropism-modification strategies for targeted gene delivery using adenoviral vectors. Coughlan L, Alba R, Parker AL, Bradshaw AC, McNeish IA, Nicklin SA, Baker AH. ***Viruses.*** 2010; 2: 2290-355.

A hitchhiker's guide to the nervous system: the complex journey of viruses and toxins Salinas S, Schiavo G, EJ Kremer. ***Nature Reviews Microbiology*** 2010; 8: 645-55.

Year 2011

Oncolytic virotherapy: combining first-rate science with anunmet clinical need. Seymour LW. ***Hum Gene Ther***. 2011. 22(4): 387-8.

Coagulation factor IX mediates serotype-specific binding of species A adenoviruses to host cells.
Lenman A, Müller S, Nygren MI, Frängsmyr L, Stehle T, Arnberg N. ***J Virol.*** 2011; 85, 13420-31.

Adenovirus: teaching an old dog new tricks. Seymour LW, Fisher KD. ***Hum Gene Ther***. 2011; 22: 1041-2.

Adventitial gene transfer of VEGFR-2 specific VEGF-E chimera induces MCP-1 expression in vascular smooth muscle cells and enhances neointimal formation. Bhardwaj S, Roy H, Babu M, Shibuya M, Yla-Herttuala S ***Atherosclerosis.*** 2011; 219: 84-91.

An adenovirus traffic update: from receptor engagement to the nuclear pore. Henaff D, Salinas S, Kremer EJ. ***Future Microbiol.*** 201; 6:179-92. Review.

Novel adenoviruses and herpesviruses detected in bats. Jánoska M, Vidovszky M, Molnár V, Liptovszky M, Harrach B, Benko M. ***Vet J.*** 2011; 189: 118-21

Year 2012

The liberation of CD44 intracellular domain modulates adenoviral vector transgene expression.
Ildefonso CJ, Bond WS, Al-Tawashi AR, Hurwitz MY, Hurwitz RL. ***J Biol Chem.*** 2012 287: 32697-707

Circumventing antivector immunity by using adenovirus-infected blood cells for repeated application of adenovirus-vectored vaccines: proof of concept in rhesus macaques. Sun C, Feng L, Zhang Y, Xiao L, Pan W, Li C, Zhang L, Chen L. ***J Virol.*** 2 012; 86: 11031-42.

Oncolytic virotherapy Russell SJ, Peng KW, Bell JC. ***Nature Biotechnol***. 2012, 30: 658-70 - Review

Chromatography purification of canine adenoviral vectors. Segura MM, Puig M, Monfar M, Chillon M. ***Hum Gene Ther Methods***. 2012 Jun 29. (contact miguel.chillon@uab.cat for reprints)

Avidity binding of human adenovirus serotypes 3 and 7 to the membrane cofactor CD46 triggers infection. Trinh HV, Lesage G, Chennamparampil V, Vollenweider B, Burckhardt CJ, Schauer S, Havenga M, Greber UF, Hemmi S. ***J Virol.*** 2012 Feb;86(3):1623-37.

Malaria vaccines: focus on adenovirus based vectors. Schuldt NJ, Amalfitano A. ***Vaccine***. 2012, 30: 5191-8. Review

Adenovirus receptors: implications for targeting of viral vectors. Arnberg N. ***Trends Pharmacol Sci***. 2012, 33: 442-8. Review

Process optimization and scale-up for production of rabies vaccine live adenovirus vector (AdRG1.3).
Shen CF, Lanthier S, Jacob D, Montes J, Beath A, Beresford A, Kamen A. ***Vaccine***. 2012; 30: 300-6.

Verapamil results in increased blood levels of oncolytic adenovirus in treatment of patients with advanced cancer. Koski A, Raki M, Nokisalmi P, Liikanen I, Kangasniemi L, Joensuu T, Kanerva A, Pesonen S, Alemany R, Hemminki A. ***Mol Ther***. 2012; 20: 221-9.

Construction of capsid-modified adenoviruses by recombination in yeast and purification by iodixanol-gradient. Giménez-Alejandre M, Gros A, Alemany R. ***Methods Mol Biol.*** 2012; 797: 21-34

10-year safety follow-up in patients with local VEGF gene transfer to ischemic lower limb.
Muona K, Mäkinen K, Hedman M, Manninen H, Ylä-Herttuala S. ***Gene Ther***. 2012; 19: 392-5.

Genome analysis of bat adenovirus 2: indications of interspecies transmission. Kohl C, Vidovszky MZ, Mühldorfer K, Dabrowski PW, Radonić A, Nitsche A, Wibbelt G, Kurth A, Harrach B. ***J Virol***. 2012; 86: 1888-92

Meetings, conferences, seminars on AdVs

The most relevant meetings scheduled up to June 30th, 2013 are listed in this section. The name of the ADVance participants (PIs, staff members and visiting scientist) are reported as well as the title of their presentation.

- January. 20-25, 2013 Gordon Conference: *Physical Virology* Ventura (CA, USA)

  Glen Nemerow *et al* ***Using Atomic Force Microscopy to Analyze Adenovirus-Host Interactions***

- February 5-6th, 2013: Swiss Workshop in Fundamental Virology, Thun, Switzerland

  Urs Greber: ***Entry of non-enveloped viruses***

  Marco Amsler (Silvio Hemmi lab), poster: ***Two host miRNAs with strong anti-adenovirus activity are down-regulated in infection***

- February 14th 2013: EU FP7_ITN ***'Project Virus entry'***, Greifensee, Switzerland

  Urs Greber: ***Host requirements for entry and uncoating of non-enveloped viruses***

- February 20th 2013: 4th Adenovirus workshop Hannover, Germany

  Urs Greber: ***Adenovirus entry***

- March 22nd-23rd, 2013, Annual Congress of the SFTCG (Société Francophone de Thérapie Cellulaire et Génique, Paris, France

  Andrew Baker: ***Adenovirus targeting and detargeting***

  Urs Greber: ***Adenovirus entry***

- 17-19 April 2013 Annual conference of the British Society for Gene Therapy (BSGT) Royal Holloway, University of London, London, UK

  Andrew Baker: ***Manipulation of the vasculature using gene- and miRNA-based therapeutics***

- April 18th, 2013: 4th HKU Pasteur Cell BiologyCourse, Hong Kong, HK/China

  Urs Greber: ***Fluorescence microscopy reveals new cues in virus trafficking & uncoating***

- May 15-18, 2013 ASGCT 16th Annual Meeting and Training Course, Salt Lake City, Utah (USA)

  Andrew Baker: (title to be communicated)

- June 9-12, 2013 Spanish National Virology Congress. Burgos, Spain,

  Ramon Alemany: ***Oncolytic adenoviruses***