

3R Research Foundation Switzerland

Annual Report | **2010**

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The 3R Research Foundation in 2010

In 2010 the Foundation provided a total of CHF 728,600 for 17 research projects. The Confederation and Interpharma each made a contribution of CHF 365,000. The Administrative Board approved 7 new projects, while 3 projects were successfully completed; 18 applications were rejected. The 3R-Info-Bulletins 42 - 44, which were circulated to around 1,000 readers, included the results of three of the completed projects. The final report on the results of the EU Start-up project (Scientific and technological issues in 3R alternatives research in the process of drug development and union politics), to which the Foundation contributed in 2008 through a meeting of experts in Basle chaired by the Scientific Adviser, is now available. The Administrative Board made efforts to network with other institutions and organisations in order to achieve greater awareness of the 3R principles. It is not yet possible to identify concrete results of these efforts.

3R-Principles

The 3Rs are Replace, Reduce and Refine animal experimentation. The 3Rs must be the guiding principles behind animal experimentation; if a study can be carried out without using any laboratory animals then such a procedure must be used. If it is essential to use laboratory animals under the terms of animal protection legislation the number used must be kept to a strict minimum. The third "R" requires that animals used for laboratory experiments be made to suffer an absolute minimum of pain and/or stress. The 3R Research Foundation funds research projects whose aim is to improve present-day experimental methods from the point of view of the 3Rs.

The Administrative Board

The Administrative Board of the Foundation is made up of nine members, three representing the Parliament (2 seats vacant), two representing animal protection, two from Interpharma and two from the Federal Veterinary Office. Current members are:

Christine Egerszegi-Obrist

member of the Council of States, Mellingen
Chairwoman

Dr. Peter Bossard

Animalfree Research Foundation, Zurich
Vice-Chairman

Chantal Galladé

National Councillor, Winterthur
(until 31.12.2010)

Dr. Franz P. Gruber

Doerenkamp-Zbinden Foundation,
Küsnacht

Prof. Paul Herrling

Head of Research, Novartis International,
Basle (until 31.12.2010)

Dr. Ingrid Kohler

Federal Veterinary Office, Berne-Liebefeld
(as from 1.6.2010)

Dr. Markus Schmutz

Novartis Pharma AG, Basle (as from 30.3.2011)

Silvia Matile-Steiner

lawyer, F. Hoffmann-La Roche Ltd., Basle

Ursula Moser, B.Sc.,

Federal Veterinary Office, Berne-Liebefeld
(until 1.6.2010)

Prof. Hans Wyss

Director of the Federal Veterinary Office,
Berne-Liebefeld

The Evaluation Committee

Prof. Peter Maier

University of Zurich
Chairman

Dr. Franziska Boess

F. Hoffmann-La Roche Ltd, Basle

Prof. Kurt Bürki

Institute of Laboratory Animal Science,
University of Zurich (until 31.12.2010)

Prof. Clemens A. Dahinden

Institute of Immunology and Allergology,
University Hospital, Berne

Prof. Marianne Geiser Kamber

Institute of Anatomy, University of Berne

Prof. Andrew Hemphill

Institute of Parasitology, University of Berne

Dr. Ingrid Kohler

Federal Veterinary Office, Berne-Liebefeld
(as from 1.6.2010)

Dr. Kurt Lingenhöhl

Novartis Pharma Ltd, Basle

Prof. Thomas Lutz

Institute of Veterinary Physiology,
University of Zurich

Ursula Moser, B.Sc.

Federal Veterinary Office, Berne-Liebefeld
(until 1.6.2010)

Dr. Martin Reist

Veterinary Public Health Institute,
University of Berne (as from 9.12.2009)

Dr. Stefanie Schindler

Animalfree Research, Zurich

Scientific Adviser

Prof. Peter Maier, University of Zurich

Administrator

Ernst P. Diener, lawyer, Münsingen

Auditors

Waber Treuhand GmbH, Einigen

Supervisory body

Federal Department of Home Affairs

Articles and statutes of the Foundation

- Deed of foundation dated 13. 2. 1987
- Regulations dated 15. 5. 1987/30. 3. 2011
- Guidelines for awarding research grants dated 15. 5. 1987 (latest modification 30. 3. 2011)

Summary of the Year's Activities

The Foundation's website

Detailed information about all the Foundation's activities can be found on its website at www.forschung3r.ch. A new addition to the website is a section entitled "3R-Methods", aimed at raising awareness regarding selected 3R methods intended to resolve specific problems in the field of life sciences

17 projects subsidised

A total amount of CHF 728,615.96 was paid out for 14 ongoing projects and 3 that were completed during 2010.

Seven new projects

Seven new projects were approved in 2010 for which a total of CHF 660,330 was earmarked. These new projects are described in detail in the list of funded projects on the Foundation's website (www.forschung3r.ch/en/projects/index.html).

Engineering of an in vitro hepatocyte tissue system for malaria liver infection research (118/10) Dr. Dalu Mancama, CSIR, Biosciences Division, Pretoria, South Africa. Resistance to currently available drugs has led to a need to develop new products or vaccines. During the development of the disease, the interaction between parasites (Plasmodia) and host in the liver plays an important role. Plasmodium falciparum, which is responsible for malaria in humans, cannot be investigated using animal models. For this reason, surrogate animal models are used because of the lack of human liver cell models in which the interaction between parasites and host can be studied. A novel tissue culture system (3D cultures) has been developed to increase the infectiousness of Plasmodium f. in human liver cells. If this is successful it will be possible to develop new treatments in liver cell cultures without the need to use laboratory animals.

Non-invasive electrical monitoring of the population spiking activity in the central nervous system (119/10) Dr. Sara Gonzalez Andino, Department of Clinical Neuroscience, University of Geneva, Switzerland. Various non-invasive methods (fMRI, optical imaging) are currently used for neuro/electrophysiological studies of the brain. None of these methods enables researchers to determine electrical activity in single cells or cell populations in the CNS, however. To date it has been necessary to implant electrodes in order to obtain more precise measurements. On the basis of the latest data from studies of epileptic patients and primates it is expected that a correlation will be found between scalp EEG and spiking activity (changes in the action potential) in cell populations. By comparing existing data series using appropriate software it should be possible to increase the spatial resolution of EEGs and to carry out many studies directly on humans. This should lead to a reduction in the number of primates required for invasive neurological investigations.

Development of non-invasive strategies to study spinal cord disease, injury and repair (120/10) Prof. Denis Jabaudon, Department of Basic Neurosciences, University of Geneva, Switzerland. Worldwide, spinal cord injury and neurodegenerative diseases (e.g. amyotrophic lateral sclerosis) are the focus of intense and increasing research using laboratory animals with the aim of determining the processes involved and devising possible therapies. Such experiments using rats and mice often necessitate spinal cord intervention. These surgical procedures are time-consuming and cause a good deal of suffering for the animals; in addition, mortality is high (up to 30%). Many such surgical procedures could be replaced by the percutaneous introduction of a micropipette, using high-resolution ultrasound guidance, to inject dyes, genetic material or cells or for therapeutic intervention or placing electrodes. This procedure takes only 2-3 minutes and does not involve exposing the spinal cord. Consequently there is far less stress for the animal and the reduced mortality rate would mean that fewer animals would be needed.

A new in vitro model to study therapeutic approaches to improve spinal cord regeneration and repair after injury (121/10) Prof. Dr. Roman Chrast, Department of Medical Genetics, University of Lausanne, and Prof. Dr. Josef Kapfhammer, Institute of Anatomy, University of Basle, Switzerland. Spinal cord injuries (SCI) affect millions of people throughout the world every year, resulting in paraplegia and chronic pain. Until now animal models have been used to study therapeutic approaches to regeneration and repair. Such studies cause a high level of distress for the animals and the complexity of the in vivo processes reduces the reproducibility of the results. Using organotypic cultures of spinal cord slices that have been developed recently, it is possible to create lesions similar to SCI. The aim of this project is to characterise the function of the cells in the slice and to test the regenerative ability of two substances already used in clinical treatment, namely Nogo A and Cethrin. If the researchers succeed in achieving comparable results to those obtained in in vivo studies it will be possible to do away with a large number of experiments using laboratory animals.

Improved perioperative analgesia and reduced stress during recovery for the experimental animal: ultrasound-guided sciatic and femoral nerve block in sheep and quantitative assessment of block quality (122/10) Dr. Helene Rohrbach, Department of Clinical Veterinary Medicine, University of Berne, Switzerland. Sheep are widely used for orthopaedic studies. In many cases the practicability (dose, duration of effect, method of administration) of the usual post-operative analgesic protocols is questionable, since sheep show hardly any outward signs of pain. In order to be sure of blocking pain more successfully, anaesthetics are administered regionally using a perineural catheter. The placing of the catheter near the sciatic and femoral nerves is monitored via ultra-sound, similar to the procedure used in humans. The efficacy of the analgesic is quantified. This should lead to the successful blockade of pain using lower doses and with fewer side-effects.

Use of "moribund" stage in the fish acute toxicity test according to OECD guideline 203 and its effect on LC50 values (123/10) Dr. Hans Rufli, ecotoxsolutions, Basle, Switzerland. In the fish acute toxicity test according to OECD guideline 203, LC50 is assessed in terms of the concentration of a test substance at which 50% of the fish die within an exposure period of 96 hours. In this project, sub-lethal effects on fish during the first 48 hours taken from reports on past testing are analysed and compared retrospectively to findings after 96 hours. The aim here is to be able to define the "moribund" stage whereby fish can be removed from the test at an earlier point without affecting the results. This would mean that the fish would suffer from the effects of the test substance concentrations for a shorter time.

Comparative in vitro and in vivo testing on biofilm formation on the surface of bone grafts (124/10) Dr. Martin Clauss, Orthopaedic Department, Cantonal Hospital Liestal, Switzerland. Infections associated with orthopaedic implants are difficult to treat because the resistant microorganisms spread around the implant in a biofilm. For this reason it is important to develop materials that prevent the formation of this biofilm. These characteristics are being tested in guinea pigs. The research team has already developed an in vitro system and its practicability will now be examined in a comparative study of the guinea pig test and the in vitro test.

Three projects successfully completed

Development of a novel multicellular 3-dimensional blood brain barrier in vitro model (93/04) Dr. Omolara Ogunshola, Institute of Veterinary Physiology, Vetsuisse Faculty, University of Zurich. In this project a 3-dimensional model of the blood-brain barrier was simulated using endothelial cells, astrocytes and pericytes. In a collagen matrix the cells form a unit with a synergistic effect. The physiological reaction of this unit to various noxious substances was comparable to that seen in experiments involving live animals. This method therefore enables researchers to carry out mechanistic experiments on the function of the blood-brain barrier without using laboratory

animals. The results obtained are summarised in 3R-Info-Bulletin no. 42.

Development of a three-dimensional enteric cell culture model for in vitro studies of the intestinal eukaryotic parasites Cryptosporidium spp. (97/05) Prof. Alexander Mathis, Institute of Parasitology, University of Zurich. Until now pathogenic intestinal parasites have been isolated in host animals (new-born calves) for subsequent experiments. In order to replace the need for live animals, a rotating system was used to culture epithelial enteric cells as a substrate for producing *Cryptosporidium parvum* parasites. The cell cultures were successfully established and can be considered as an in vitro model of the intestinal epithelium. The rate of production of the parasites in the cell cultures was extremely low, however, and limited to two days.

Establishment of an in vitro system for the prediction of the degree of virulence of classical swine fever virus isolates (105/06) Dr. Nicolas Ruggli, Institute of Virology and Immunoprophylaxis (IVI), Mittelhäusern, Switzerland. The degree of virulence of the swine fever virus after an outbreak is normally tested on pigs. This project involves developing a procedure for determining the virulence of the swine fever virus in cell cultures. Dr. Nicolas Ruggli and his research team succeeded in finding a cell-line in which the 17 selected, well documented virus isolates reproduced using a standard culture method without causing changes to the cell-line. The characteristics of the viruses in three different cell tests (cell-line, swine macrophages and plasmocytic dendritic cells) reliably showed whether the viruses had a high, medium, low or negligible level of virulence. Thanks to this in vitro diagnostic method, it will no longer be necessary to test for virulence in live animals. The results of this project were summarised in 3R-Info-Bulletin no. 44.

3R-Info-Bulletins

3R-Info-Bulletins are published on the Foundation's website (www.forschung3r.ch/en/publications/index.html).

The blood-brain barrier in a dish: a new multicellular in vitro model (No. 42, February 2010) The research team led by Dr. Lara Ogunshola, Institute of Veterinary Physiology, University of Zurich, succeeded in creating an in vitro 3-D model of the blood-brain barrier comprising three main cell types: epithelial cells, astrocytes and pericytes. The blood-brain barrier protects the brain but its function is affected by various diseases such as stroke, Alzheimer's and neuro-AIDS. The physiological reaction to hypoxic conditions corresponded to the in vivo situation. The team was able to investigate complex processes such as the synergistic interactions between various cell types. This method will make it possible to answer numerous questions concerning the function of the blood-brain barrier without resorting to the use of laboratory animals.

Fish acute toxicity test: The number of animals can be reduced (No. 43, June 2010) In testing fish for acute toxicity (OECD Protocol no. 203), the dosage of the substance tested is often too high or too low. Together with Swiss and foreign specialists, Dr. Hans Ruffli of Ecotoxolutions in Basle analysed historical data on hundreds of chemicals used in agriculture and industry. Using retrospective computer simulations of testing procedures the team were able to demonstrate that the number of fish involved could be reduced by 15%. If the preliminary tests are carried out on fish embryos, a further considerable reduction in the number of fish required can be achieved without compromising the validity of the results with regard to the toxicity of potential environmental pollutants. The necessary steps have already been taken to have these results taken into account in the OECD guidelines.

From pigs to cells: Virulence of classical swine fever virus is predictable in cell cultures (No. 44, October 2010) Dr. Nicolas Ruggli and his research team at the Institute for Viral Diseases and Immunoprophylaxis, Mittelhäusern, Switzerland, have succeeded in developing a cell culture test for assessing the virulence of the virus in classical swine fever. The degree of virulence is important for monitoring and preventing the disease. Until now it could be assessed only by examining infected animals. The tests involve a cell culture for reproducing the virus and three tests to determine viral foci on a cell overlay, the macrophage infection rate and the production of IFN-alpha. A comparison with the virulence of 17 known viruses showed that, taken together, the three parameters provide a prediction of virulence that is equally as good as that obtained using live animals.

Origin of the Foundation

The Foundation is a cooperative institution set up by the Parliamentary Group for Animal Experimentation Questions (public organ), Interpharma (association of pharmaceutical companies that carry out research, comprising at present Actelion Ltd, Merck Serono Ltd, Novartis Pharma Ltd, F. Hoffmann-La Roche Ltd, and the associated members Bayer (Switzerland) Ltd, Cilag Ltd and Vifor Ltd) and the Animalfree Research Foundation (animal protection). The Foundation was entered in the commercial register on 18 August, 1987.

The funds for subsidising research are provided principally by the Federal Veterinary Office and Interpharma.

Purpose of the Foundation

The purpose of the 3R Research Foundation Switzerland is to promote alternative research methods through grants for research projects. The organisation supports first and foremost projects aimed at developing new methods or refining accepted methods (validation) which offer practical improvements vis-à-vis standard animal experimentation in line with the 3R motto, Replace, Reduce, Refine.

A broad range of projects is funded on the condition that they are likely to replace animal experimentation or to reduce the number of animals used or the stress and/or pain suffered. Accordingly, projects based on the Foundation's three principles and covering any of a broad selection of bio-medical disciplines will be taken into consideration.

Activities during 2010

In its twenty-fourth year of existence the Administrative Board met twice, namely in June and December, for a half-day meeting. Apart from the statutory business concerning the end of the business year 2009, the Board addressed the following issues.

Research funds for 2010 were allotted to 14 projects already underway. In addition, 7 new projects were approved, while 18 applications were rejected. The Board also took note of the final assessment by the Evaluation Committee of 3 projects which had been completed in the previous year. An internal working group was set up to review the scope of the Foundation's activities. In this connection, the Administrative Board is trying to network with other institutions and organisations in the future, in order to achieve greater awareness of the 3R principles. Initial discussions were held with the Swiss National Science Foundation (SNF), the Swiss Academy of Medical Sciences (SAMW) and the Swiss Academy of Natural Sciences (SCNAT), although no concrete agreements have yet been reached.

At its meeting in June, the Board focused on the financial statements for 2009 and the approval of new projects, as well as on those projects that had been completed. Furthermore, it was decided to contact institutions with which the Foundation is keen to network.

At the December Board meeting, the focus was on approving new projects as well as discussing financial issues. Owing to the fact that the necessary funds are not forthcoming, it was not possible to approve all the applications recommended by the Evaluation Committee. A further topic of discussion was the modification of the deed of foundation and the revision of the regulations with the aim of adapting both texts to current circumstances and requirements, as well as making the appeal procedure more practical. The revised texts are to be voted on at the next meeting of the Administrative Board. The Board then went on to discuss the Foundation's activities in 2010 and efforts to network the Foundation with members of the Evaluation Committee. The meeting was rounded off with a dinner.

The Secretary, now renamed the Administrator, is responsible for the day-to-day running of the Foundation; he deals with all matters that cannot be passed on to anyone else. In particular, he prepares all the necessary information for the Administrative Board to take their decisions, as well as dealing with correspondence with appli-

cants and project managers. He also deals with payments, book-keeping, closing the books at the end of the financial year and the budget. In addition, he prepares the text of the Annual Report as well as texts for the Foundation's website.

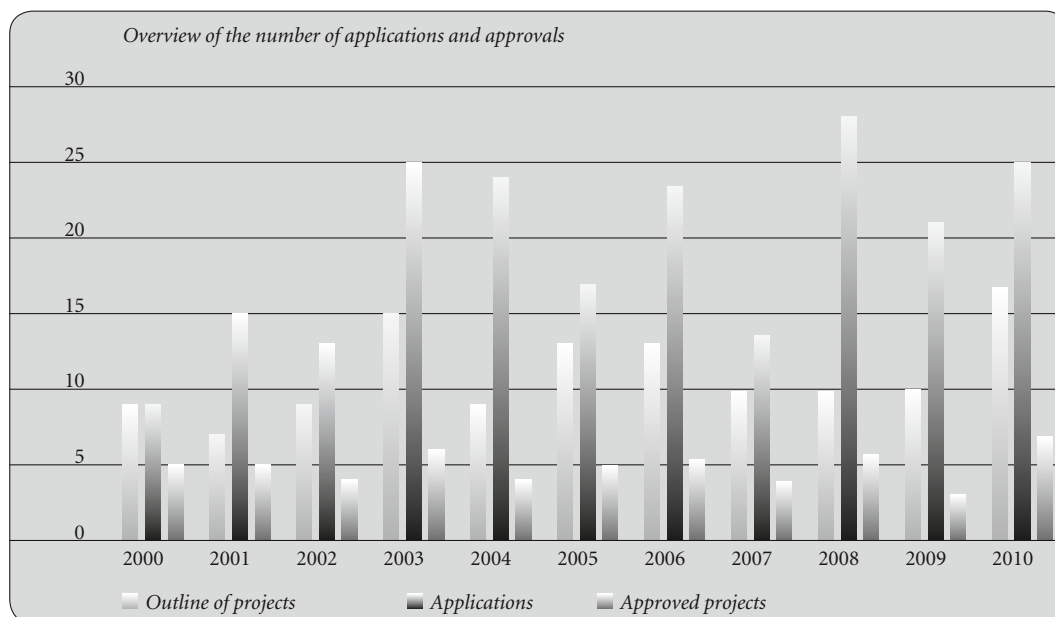
Under the chairmanship of the Scientific Adviser, the Evaluation Committee held two meetings during the year, where in particular they examined 25 new applications for funding and evaluated the 3 completed projects. The voluntary work of the members of the Evaluation Committee in this connection is much appreciated.

The Scientific Adviser's tasks included publishing the 3R-Info-Bulletins (in the form of brochures and on the Foundation's website at www.forschung3r.ch), writing the brief scientific reports in English which present the projects receiving funding on the Foundation's website and regularly updating these reports. He was also kept busy – as always – advising applicants and project managers, obtaining intermediate reports, evaluating project outlines, dealing with enquiries and explaining why projects had been rejected. As a co-organiser of the EU START-UP project he helped to prepare the final report. Finally, he represented the Foundation at several scientific meetings in Switzerland and abroad, namely at the Annual General Meeting of the European Consensus Platform for 3R Alternatives to Animal Experimentation in Milan and as a member of the Mirror Group of the EPAA Initiative in Brussels (for further information visit <http://www.ecopa.eu> and http://ec.europa.eu/enterprise/epaa/index_en.htm).

Overview of the number of applications and approvals

During the year 3 projects were completed (93/04, 97/05, 105/06). Together with those projects completed earlier, this brings the total of finished projects to 100 out of 124.

The bar-chart shows that more than 10 outline of projects are submitted each year and over 20 applications are submitted. The proportion of projects approved has varied little over the past



few years, with funding being granted for around 5 projects each year. The long-term approval rate for applications is around 30%. Basically, this figure reflects the careful consideration given to each application from the point of view of its relevance to the 3R principles. Consequently, it often happens that projects that are well structured and of considerable scientific interest are not approved for funding because their relevance to the 3R principles is not sufficiently great. In 2010 more projects were recommended for approval by the Evaluation Committee than could in practice be funded. The number of projects approved was therefore limited by the level of available funding.

Personnel

Ursula Moser, who has represented the Federal Veterinary Office on the Administrative Board and the Evaluation Committee, resigned for professional reasons. Her hard work for both bodies has been much appreciated. Her seats on the Board and the Committee has been taken by Dr. Ingrid Kohler, who also works at the Federal Veterinary Office, for the remaining period of office of 2007/2010. National Councillor Chantal Galladé, Winterthur, and Prof. Paul Herrling, Novartis Pharma AG, Basle, left the Administrative Board, and Prof. Kurt Bürki, Institute of Laboratory Animal Science, University of Zurich,

left the Evaluation Committee having completed their periods of office (2007-2010).

Financial business

A total of some CHF 730,615 was paid out for research in 2010 (CHF 728,615.96 for grants to research projects and CHF 2,000 for participation in conferences). Expenditure on current projects was some CHF 49,000 over budget (CHF 679,768.52). On the one hand, CHF 82,000 budgeted was not spent, but on the other an amount of CHF 131,000 was already used for newly approved projects. Only CHF 2,000 out of a budgeted amount of CHF 6,000 was spent on attendance at conferences.

Operational expenditure for 2010 amounted to CHF 204,641.05 (project monitoring and information CHF 102,825.70, administrative costs including office infrastructure CHF 101,815.35). Total expenditure was therefore around CHF 14,500 below the budget of CHF 219,200. This was principally due to a drop in the remuneration of the Administrator and the Scientific Adviser, which is dependent on the amount of work done (- CHF 8,000) as well as the contribution for method publications (- CHF 6,000). Administrative costs were some CHF 9,000 below budget (CHF 111,200). Total expenditure therefore amounted to CHF 935,257.01.

Financial statements

<i>Profit and loss account 2010</i>	<i>Expenditure</i>	<i>Income</i>
<i>Income</i>		
Federal contribution		365,000.00
Contribution from Interpharma		365,000.00
Total contributions		730,000.00
Interest on bank account		877.75
Other income		96.13
Total income		730,973.88
<i>Expenditure</i>		
Research grants	730,615.96	
Project supervision and information	102,825.70	
Administrative expenses	101,815.35	
Total expenditure	935,257.01	
Excess expenditure over income	-204,283.13	
	730,973.88	
<i>Balance as per 31st December 2010</i>	<i>Assets</i>	<i>Liabilities</i>
<i>Liquid Assets</i>		
Bank	422,513.41	
Accounts payable	307.20	
Accounting apportionment assets	2,639.10	
<i>Liabilities</i>		
Accounting apportionment liabilities		156,623.05
Unused research funds		
– Carried forward 1. 1. 2010	472,119.79	
– Excess expenditure over income	-204,283.13	267,836.66
Capital of the Foundation		1,000.00
	425,459.71	425,459.71

Contingent liabilities

Approved research grants not yet paid out CHF 1,026,552.65.

Münsingen, 24 February 2011

3R RESEARCH FOUNDATION

Chairwoman

signed C. Egerszegi

Secretary

signed E. Diener

On the income side, the equal financial commitment of the federal authorities and Interpharma represented the basic funding for the Foundation's activities. In 2010 the federal authorities and Interpharma each granted the Foundation CHF 365,000. As a result of low interest rates, interest on capital was only CHF 877.75.

Total income was therefore around CHF 730,973 while total expenditure amounted to CHF 935,257, giving an excess of expenditure over income of around CHF 204,283. The unused contributions item fell from approximately CHF 472,120 at the end of 2009 to CHF 267,836 at the end of 2010.

At the end of 2010 the total earmarked for projects approved by the Board but not yet paid out amounted to CHF 1,026,552.65. This future liability is covered by Interpharma's promise of funding (V). The Foundation's credit with this institution amounted to CHF 1,562,000 at the end of 2010.

The budget for 2011 includes around CHF 648,554 for current projects and a maximum amount of CHF 500,000 for new projects.

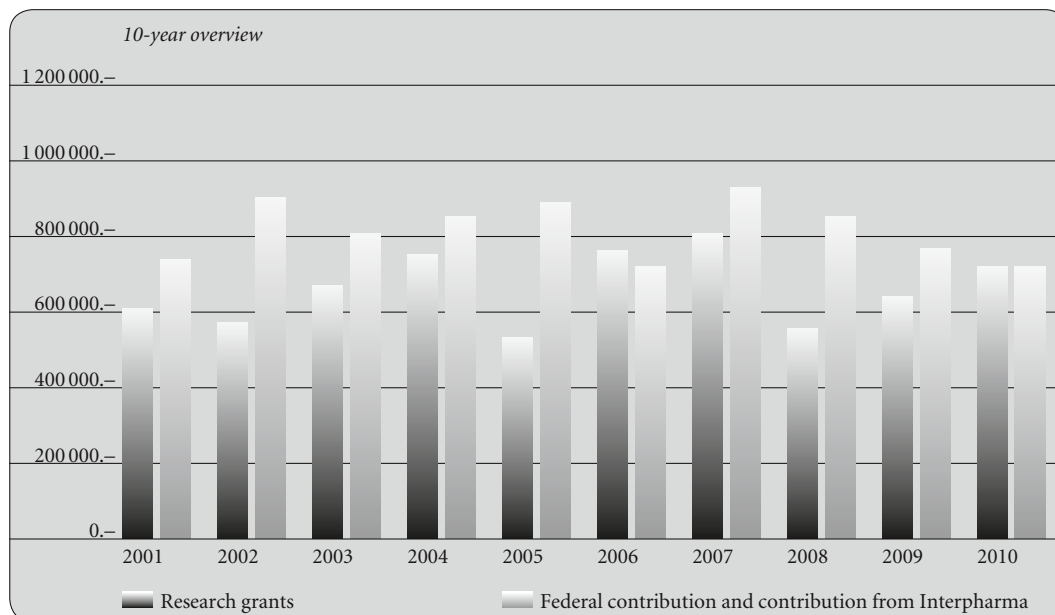
Auditors' report to the Administrative Board

Waber Treuhand GmbH in Einigen audited the financial statements for the year according to standards of limited auditing and did not find any indication that the accounts and statements do not correspond to current legislation or the principles and regulations of the Foundation.

Overview of grants awarded between 1987 and 2010

At the end of 2010 a total of CHF 17,157,960.25 had been granted for projects and other subsidies, of which CHF 16,131,407.60 had been paid out so far. Together the federal authorities and Interpharma have contributed CHF 19,176,000 to the Foundation since 1987.

Should the trend seen over the last three years persist, namely a rise in the amount paid out in subsidies and the number of applications worthy of support vis-à-vis a drop in the contributions received from the Confederation and Interpharma, as can be seen from the chart of developments since 2001, it is to be feared that in the future it will not be possible to fund a greater number of 3R-relevant projects.



3R-Info-Bulletin

In 2010 three more new 3R-Info-Bulletins (ISSN 1421-6590) were published in English and distributed to some 1,000 interested parties. The information bulletins are also published on the Foundation's website (www.forschung3r.ch/en/publications/index.html), as well as in pdf format.

The latest 3R-INFO-BULLETINS are:

N° 44, October 2010

From pigs to cells: Virulence of classical swine fever virus is predictable in cell cultures

N° 43, June 2010

Fish, Acute Toxicity Test: The number of animals can be reduced

N° 42, February 2010

The blood-brain barrier in a dish: a new multicellular in vitro model

List of the other 3R-INFO-BULLETINS

N° 1, June 1994

Foundation Research 3R

N° 2, September 1994

mAbs without mice?

N° 3, December 1994

Prof. Gerhard Zbinden and 3R

N° 4, April 1995

Predicting human drug metabolism

N° 5, August 1995

Human recombinant antibodies

N° 6, September 1995

Call for 3R research proposals

N° 7, March 1996

The three 'R's of Russell and Burch, 1959

N° 8, August 1996

Regulation of digestion in cell culture

N° 9, October 1996

Permanent fish cell cultures as novel tools in environmental toxicology

N° 10, August 1997

10 years 3R Research Foundation

N° 11, March 1999

Immunization of laboratory animals

N° 12, September 1999

Leishmaniasis: development of an in vitro assay for drug screening

N° 13, January 2000

Identification of neurotoxic chemicals in cell cultures

N° 14, May 2000

Transgenic protozoa as an alternative to transgenic animals

N° 15, September 2000

Aggregating brain cell cultures: Investigation of stroke related brain damage

N° 16, January 2001

Housing and husbandry conditions affect stereotypic behaviour in laboratory gerbils

N° 17, May 2001

Fever in the test tube – towards a human(e) pyrogen test

N° 18, September 2001

Prevention of adverse effects in pigs after vaccination

N° 19, January 2002

Phenotype characterisation and welfare assessment of transgenic mice

N° 20, May 2002

Animal-free screening of biological materials for contamination by rodent viruses

N° 21, September 2002

Identification of new human skin irritation markers for tests with human skin reconstructs

N° 22, January 2003

Environmental enrichment does not affect the variability of animal experimentation data in the Light/Dark test

N° 23, May 2003

Simulation of stroke related damage in cultured human nerve cells

N° 24, September 2003

Generation of parasite cysts in cultured cells instead of living animals

N° 25, January 2004

Formation of new blood vessels in the heart can be studied in cell cultures

N° 26, May 2004

Immune cells in the liver: The generation and use of a mouse Kupffer cell line

N° 27, September 2005

The tick blood meal: From a living animal or from a silicone membrane?

N^o 28, January 2005

Bone metabolism and bone-biomaterial interactions can be studied ex vivo

N^o 29, May 2005

Computer-based quantification of (adverse) effects triggered by drugs and chemicals

N^o 30, September 2005

Environmental enrichment does not disrupt standardization

N^o 31, January 2006

Improvement of Pain Therapy in Laboratory Mice

N^o 32, May 06

Non-Invasive Methods: Investigation of Airways Diseases by MRI in Rats

N^o 33, September 06

Predicting drug hypersensitivity by in vitro tests

N^o 34, January 07

Exploring natural anticoagulation by endothelial cells: A novel in vitro model

N^o 35, May 07

From blood to brain and vice versa: Transport Processes in Choroid Plexus can be studied in vitro

N^o 36, January 08

Host pathogen interactions can be studied in amoebae instead of laboratory animals

N^o 37, June 08

The bioconcentration of chemical substances in fish can be determined in vitro

N^o 38, October 08

Development of an in-vitro system using lung cells to determine the harmful effects of particles and gaseous substances

N^o 39, February 2009

Detection of Pain in Laboratory Animals via Gene Expression?

N^o 40, June 2009

Refined ex-vivo rodent heart model reduces in vivo experimentation

N^o 41, October 2009

A novel in-vitro cell model of the human airway epithelium

List of Projects

A complete list of projects with summaries of each can be found on the Foundation's website (www.forschung3r.ch/en/projects/index.html).

The brief scientific project reports in English, which are updated once a year, indicate that almost all projects have progressed well. These reports published on the internet are much appreciated by those involved in the research projects as a platform for presenting their work. From the opposite point of view, this system also enables other researchers all over the world to discover new 3R methods without delay.

List of new projects approved in 2010

124/10 Dr. Martin Clauss

Orthopaedics Department,
Cantonal Hospital Liestal
Comparative in vitro and in vivo testing on biofilm formation on the surface of bone grafts

123/10 Dr. Hans Ruffli

ecotoxsolutions, Basle
Use of "moribund" stage in the fish acute toxicity test according to OECD guideline 203 and its effect on LC50 values

122/10 Dr. Helene Rohrbach

Department of Clinical Veterinary
Medicine, University of Berne
Improved perioperative analgesia and reduced stress during recovery for the experimental animal: ultrasound-guided sciatic and femoral nerve block in sheep and quantitative assessment of block quality

121/10 Prof. Roman Chrast and Prof. Josef Kapfhammer

Department of Medical Genetics, University of Lausanne, and Anatomical Institute, University of Basle
A new in vitro model to study therapeutic approaches to improve spinal cord regeneration and repair after injury

- 120/10 Prof. Denis Jabaudon
Department of Basic Neurosciences,
University of Geneva
Development of non-invasive strategies to study spinal cord disease, injury and repair
- 119/10 Dr. Sara Gonzalez Andino
Department of Clinical Neurosciences,
University of Geneva
Non-invasive electrical monitoring of the population spiking activity in the central nervous system
- 118/10 Dr. Dalu Mancama
CSIR, Biosciences Division, Pretoria,
South Africa
Engineering of an in vitro hepatocyte tissue system for malaria liver infection research
- List of current projects and those completed in 2009 and 2010**
- 82/02 Dr. Nicolau Beckmann
Novartis Institute of Biomedical Research,
Basle
Magnetic resonance imaging (MRI) for the non-invasive assessment of lung inflammation and pulmonary function in the rat
- 84/02 Dr. Urs Wirthmüller / Prof. Clemens A Dahinden
Institute of Immunology, Berne University Hospital
Direct cloning of human monoclonal antibodies from purified specific B-cells
- 92/04 Prof. Elisabetta Padovan
Gulbenkian Institute of Science, Oeiras,
Portugal
Adjuvanticity of microbial-derived particles and synthetic analogs in vitro
Completed in 2009
- 93/04 Dr. Omolara Ogunshola
Institute of Veterinary Physiology,
University of Zurich
Development of a novel multicellular 3-dimensional blood brain barrier in vitro model
Completed in 2010
- 96/05 Dr. Paolo Cinelli
Institute for Laboratory Animal Science
Assessment of pain and stress in mice by monitoring gene expression changes
Completed in 2009
- 97/05 Prof. Alexander Mathis
Institute of Parasitology, University of Zurich
Development of a three-dimensional enteric cell culture model for in vitro studies of the intestinal eukaryotic parasites Cryptosporidium spp.
Completed in 2010
- 98/05 Prof. Christoph Müller
Institute of Pathology, University of Berne
Establishment of a murine syngeneic co-culture system of intestinal epithelial cells with intraepithelial T-lymphocyte subsets
Completed in 2009
- 99/05 Prof. Pierre Cosson
Medical Faculty, University Medical Centre, Geneva
Non-mammalian Experimental Models for the study of bacterial infections (NEMO network)
- 101/06 Prof. Norbert Goebels
Dept. of Neurology and Neuroimmunology, University Hospital Zurich
Organotypic CNS slice cultures as an in vitro model for immune mediated tissue damage and repair in multiple sclerosis
- 102/06 Dr. Anna Bogdanova
Institute of Veterinary Physiology,
University of Zurich
Isolated, autologous blood-perfused heart: Replacement of heterotopic heart transplantation
Completed in 2009
- 103/06 Prof. Stephen Leib
Institute of Infectious Diseases,
University of Berne
An in vitro Model of Central Nervous System Infection and Regeneration: Neuronal Stem Cells as Targets of Brain Damage and Regenerative Therapies in Bacterial Meningitis

- 104/06 Prof. Regina Hofmann-Lehmann
Clinical Laboratory, Vetsuisse Faculty,
University of Zurich
Development of in vitro strategies to propagate and characterize hemotrophic mycoplasmas
Completed in 2009
- 105/06 Dr. Nicolas Ruggli
Institute of Virology and Immunoprophylaxis (IVI), Mittelhäusern
Establishment of an in vitro system for the prediction of the degree of virulence of classical swine fever virus isolates
Completed in 2010
- 106/07 Dr. Song Huang
Epithelix Sàrl, Plan-les-Ouates
Standardization and Pre-validation of MucilAir: A novel in vitro cell model of the human airway epithelium for testing acute and chronic effects of chemical compounds
Completed in 2009
- 107/07 Dr. Sushila D'Souza
Pasteur Institute of Brussels
Evaluation of an in vitro model to identify host parameters associated with virulence of Toxoplasma gondii strains
- 108/07 Prof. Helmut Segner
Center for Fish and Wildlife Health,
University of Berne
In vitro fish hepatocytes as source of metabolic clearance data in alternative approaches for the reduction or replacement of in vivo bioaccumulation testing with fish
- 109/08 Prof. Paul Honegger and Dr. Marie-Gabriele Zurich
University of Lausanne
Evaluation of lipid fractions for the substitution of serum in cell culture media
- 110/08 Prof. Jennifer Keiser
Swiss Tropical and Public Health Institute,
Medicine, University of Basle
Development of an in vitro assay for the screening of antischistosomal drugs
- 111/08 Prof. Patrick Hunziker
University Hospital, Basle
Establishment of an organ ex-vivo tissue slice model for cardiovascular research in particular for therapeutic atherosclerosis targeting
- 112/08 Dr. Zhijie Luo and
Prof. Jennifer Kirkham
Leeds Dental Institute, University of Leeds,
UK
A novel in vitro model for holistic assessment and optimisation of engineered tissue for functional cartilage repair
- 113/08 Dr. Artur Summerfield/Dr. Kenneth McCullough
Institute of Virology and Immunoprophylaxis (IVI), Mittelhäusern
Generic in vitro evaluation assay for immunological correlates of protection to replace animal challenge infections
- 114/08 Dr. Hans Rufli
ecotoxsolutions, Basle
Reduction in the number of fish used in the fish acute toxicity test
- 115/09 Dr. Olivier Preynat-Seaube
Department of Pathology and Immunology, University of Geneva
Engineering of a human brain tumor model to replace animal experimentation
- 116/09 Dr. Anna Oevermann
Neurocenter, DCR-VPH,
Vetsuisse Faculty, University of Berne
Organotypic slice cultures derived from brains obtained from slaughterhouses as an in vitro alternative for the investigation of neuroinfectious diseases in ruminants
- 117/09 Prof. Maria Wartenberg
AG Molekulare Kardiologie, Friedrich-Schiller-University, Jena
Development of an in vitro model from embryonic stem cells for identifying tissue inflammation as a reaction to implanted material (INFPLANT)



Office | Dorfplatz 5 | P.O. BOX 1372
CH-3110 Münsingen | Switzerland

Phone 031 722 08 30 | Fax 031 722 08 34 | secretary.3r@bluewin.ch | www.forschung3r.ch