

Activity Report 01.01.2016 – 31.12.2016

During the year 2016, the ResOrtho Foundation dedicated itself to supporting the commissioning of the *Balgrist Campus* and its *Muscle Biology Professorship*.

Changes in the Foundation Board

In 2016, we were pleased to welcome Prof. Klaus Wellershoff as a Member of the Foundation Board. With his expertise in questions of finance and economics, Prof. Wellershoff has significantly influenced and promoted the activities of the Foundation since the start of his service. He replaces Mr Hans Hofmann, the former cantonal councillor and parliamentary representative, who resigned from the board after many years of extremely successful service.

1. Activities of the Foundation

I. Musculoskeletal Research and Development Centre, *Balgrist Campus*

Together with the Balgrist Association, the ResOrtho Foundation is co-owner of Balgrist Campus AG. The Research and Development Centre, *Balgrist Campus*, was handed over to the users at the beginning of 2016. Two of the three ResOrtho Foundation Board members served on the Balgrist Campus AG Board during the first operational year of the Campus and, with the acceptance of the final accounts for the building work, can state that the building is not only of very high quality but was also completed on time and within budget.

Operation has commenced smoothly, and been greeted enthusiastically by research workers, doctors and patients alike. The remarkable structure of the building is proving most successful: the Balgrist Campus concept has aroused enormous interest in both its architecture and function. The magnitude of this interest is reflected in the evening events and guided tours that are being held almost every week for a wide variety of interested parties, including the Canton of Zurich Business and Economic Division and the International Foundation for Research in Paraplegia, as well as various service clubs and architecture associations.

Thanks to higher than expected capacity utilisation and lower than expected operating costs, the first year of operation has avoided a deficit and the annual financial report even shows a very slight profit.

On the request of the principal users, Professors Gerber, Curt and Pfirrmann, the Campus was evaluated in depth by the Swiss National Science Foundation and the Swiss Science and Innovation Council for a possible designation as a research platform of national importance. In December 2016, the Federal Department of Economic Affairs, Education and Research declared the *Balgrist Campus* to be a **research facility of national importance** for musculoskeletal imaging, musculoskeletal biobanking and movement analysis. The *Balgrist Campus* was initially endowed with generous research grants for four years. First of all, this outstanding distinction and positive confirmation of expectations is certainly the result of the exceptional research being carried out but it is also a clear recognition of the importance of musculoskeletal research, which is significantly underfinanced given its socioeconomic relevance.

It does, however, present a huge challenge to the ResOrtho Foundation and the Balgrist Campus AG: an **infrastructure in the order of CHF 12 million** has to be provided, once again financed through third parties, in order to be able to accommodate and use the new research infrastructure.

II. **Project: Visiting sabbaticals on *Balgrist Campus***

The ResOrtho Foundation has developed the concept of “Group sabbaticals” to promote international networking and to reinforce the research location Balgrist – University - Zurich. The Scientific Advisory Board will identify world leaders active in fields relevant to the research being carried out at *Balgrist Campus*. These experts will be invited to carry out research on the Campus for periods of six months to a year, to exchange information with the resident research teams and expand their own knowledge. Invitations will be extended not only to individual research workers but to whole teams consisting of a principal investigator, at least one advanced scientist and, whenever possible, a technician, so that the research groups will be cooperating at every level

and the visiting expert can continue to work with some familiar team members.



In an extremely successful and inspirational 2016 pilot scheme, Prof. Samuel Ward, lead in Orthopaedics and Bioengineering research at the University of California and head of the Muscle Biology Laboratory in San Diego, became the first visiting professor on the *Balgrist Campus*, confirming previous conviction that this would be a great pioneering development in the Campus activities.

ResOrtho aims to generate sufficient funding to offer a visiting sabbatical each year and is grateful for all your support.

III. Muscle Biology Professorship (Foundation Chair)

Staff: Prof. Martin Flück, Head of Department

Dr. sc. nat. Marco Toigo, senior assistant (70%)
Dr. Paola Valdivieso, postdoctoral research worker (70%)
Céline Ferrié, MSc, scientific/lab assistant (100%)
Dr. Stephanie Kasper, biology lab/administrative assistant
Else-Marie Pedersen, biology lab assistant (80%)
Dr. sc. ETH Sandro Müller (scientific associate) external

Supervised PhD students: 2
Supervised Master's students: 11

The Muscle Plasticity Laboratory under the aegis of Prof. M. Flück is taking a system approach with the goal of understanding how muscles adapt to changes in demands due to injury, training, or immobilisation and looking at all these aspects from whole active muscle to individual molecule. Using a variety of techniques to characterise molecular, cellular and biomechanical changes in muscle tissues in animal and human studies, the team is also looking at genetic factors and pharmacogenomic information for pharmacological interventions. They have already come closer to demonstrating the mechanism of anabolic resistance with chronic tendon ruptures in sheep, and to identify genetic differences between healing and non-healing patients with poor results after tendon repair. Particular attention is being paid to the quantitative analysis of the mechano-regulation and perfusion-dependent metabolic regulation of muscle plasticity. Reports of the success of the first larger-

scale studies that have been carried out or are still ongoing must wait until next time. Key publications from the muscle plasticity group in 2016 were:

1. Agten CA, Buck FM, Dyer L, Flück M, Pfirrmann CW, Roskopf AB. Delayed-Onset Muscle Soreness: Temporal Assessment With Quantitative MRI and Shear-Wave Ultrasound Elastography. (American Journal of Roentgenology)
2. Aguayo D, Mueller SM, Boutellier U, Auer M, Jung HH, Flück M, Toigo M. One bout of vibration exercise with vascular occlusion activates satellite cells. (Experimental Physiology)
3. Flück M, Ruoss S, Möhl CB, Valdivieso P, Benn MC, von Rechenberg B, Laczko E, Hu J, Wieser K, Meyer DC, Gerber C. Genomic and lipidomic actions of nandrolone on detached rotator cuff muscle in sheep. (The Journal of Steroid Biochemistry and Molecular Biology)
4. Roskopf AB, Ehrmann C, Buck FM, Gerber C, Flück M, Pfirrmann CW. Quantitative Shear-Wave US Elastography of the Supraspinatus Muscle: Reliability of the Method and Relation to Tendon Integrity and Muscle Quality. (Radiology)
5. van Ginkel S, Ruoss S, Valdivieso P, Degens H, Waldron S, de Haan A, Flück M. ACE inhibition modifies exercise-induced pro-angiogenic and mitochondrial gene transcript expression. (Scandinavian Journal of Medicine & Science in Sports)
6. Vaughan D, Brogioli M, Maier T, White A, Waldron S, Rittweger J, Toigo M, Wettstein J, Laczko E, Flück M. The Angiotensin Converting Enzyme Insertion/Deletion Polymorphism Modifies Exercise-Induced Muscle Metabolism. (PLOS One)
7. Frese S, Valdivieso P, Jaecker VC, Harms SA, Konou TM, Tappe KA, Schiffer T, Frese L, Bloch W, Flück M. Expression of Metabolic and Myogenic Factors during two Competitive Seasons in Elite Junior Cyclists. (Deutsche Zeitschrift für Sportmedizin)

IV. Individual academic sponsorship for young researchers

Due to the major investments in the *Balgrist Campus*, no individual grants were awarded in 2016. An overview of donations received and how they were used can be seen in section 2. "Overview of the financial situation".

2. Overview of the financial situation

In accordance with their contract, the ResOrtho Foundation transferred CHF 600,000 to the University of Zurich for the Muscle Biology Professorship (Foundation Chair) of Prof. M. Flück.

In 2016, the Foundation recorded some CHF 51,000 in donations.

As in the previous year, the costs of accounting and auditing, as well as banking fees and custodian charges were kept at a low level. Management costs also remained similar to those of the previous year.

Following detailed evaluation, the Foundation's assets were entrusted to Albin Kistler AG for asset management (cf. Annual Report 2015). At the same time, Mr Rudolf Blättler, the auditor of ResOrtho since it was founded, stepped down. The Foundation Board has appointed the Swiss Audit Corporation to provide his successor.

3. Acknowledgements and outlook

All the members of the Foundation Board have offered their services on a pro bono basis. Many other people have also sustained and further strengthened the Foundation in its activities.

In particular, we would like to thank the following individuals, companies and foundations who have supported us with generous donations and thereby contributed to achieving the Foundation's goals:

- Hansjoerg Wyss Foundation and Fidelity Charitable Gift Fund
- Schindler Holding AG
- Novartis Foundation
- OAK Foundation
- Thomke Invest AG
- Borer Chemie AG
- Canton Zurich lottery fund
- Karl Storz Endoskope
- Medacta International
- Swiss Asset Partners Holding AG
- Werner H. Spross-Stiftung
- Werner M. Wolf AG
- Prokurations-Anstalt Vaduz
- Wellershoff Partners Ltd.
- Frau M. Bodmer
- Prof. Christian Gerber
- Robert Zingg
- F. Fahrni
- D. & D. Goeudevert

The ResOrtho Foundation is still dependent on donations to maintain its future responsibilities (the project for visiting professorships on *Balgrist Campus* and a research infrastructure of national importance).

Thank you very much for your interest and support. We do hope that you will continue to want to play a part in our projects and goals.

Prof. C. Gerber, President of the Foundation Board