



ACHILLES[®]

ADVANCING TENDON REGENERATIVE THERAPIES

NEWSLETTER
FEBRUARY
2020

ABOUT

Achilles: Overcoming specific weaknesses in tendon biology to design advanced regenerative therapies

The European Horizon2020 Twinning project Achilles reflects the weaknesses in specific areas of expertise that UMinho envisions to overcome through the twinning process in order to advance the field of Tissue Engineering to develop regenerative medicine therapies for tendon regeneration.

Achilles Partners

Achilles is coordinated by the 3B's Research Group of the University of Minho (UMINHO, Portugal), with the participation of The Regenerative, Modular & Developmental Engineering Laboratory, National University of Ireland Galway (NUIG, Ireland) and the Department of Trauma Surgery, University Regensburg Medical Centre (UHREG, Germany).



2.2 OUR EVENTS

PREVIOUS



Achilles Kick-off Meeting

3 December 2018

3B's Research Group, UMinho

The kick-off meeting consisted in a full day presenting the project objectives and specific tasks, and the management structure and procedures were organised. It counted with representatives from UMINHO, UHREG, NUIG and MAYO.



First Achilles Conference:

Molecular and biological mechanisms of tendon homeostasis and repair

8-10 July 2019

Fundação Cupertino de Miranda, Porto, Portugal



The First Achilles Conference focused on Molecular and biological mechanisms of tendon homeostasis and repair covering topics such as tendon development mechanisms, signaling pathways in tendon development, health and disease, biomarkers of tendon disease and regeneration, in vivo models to study tendon regeneration and the use of growth factors to stimulate tendon regeneration were covered. The program consisted in master classes/keynote lectures from worldwide recognized experts in the field, sessions with oral and poster presentations by young researchers, and social/cultural activities.

Second Achilles Conference

Tendon biophysical environment

4-5 November 2019

Hotel Vila Galé, Braga, Portugal

The Second Achilles Conference focused on Tendon biophysical environment and covered several scientific topics related with tendon ageing and mechanotransduction pathways, strategies to recreate the tendon microenvironment in health and disease, and use of tissue engineering concepts in tendon regeneration were covered.

The conference gathered a set of world experts/leaders in the field as keynote speakers, oral and rapid-fire presentations by young researchers, and a poster session.



2.1 OUR EVENTS

UPCOMING



First Achilles Summer School

High-throughput screening techniques



July 2020

Theoretical and training activities in which researchers of Department of Trauma Surgery, University Regensburg Medical Centre, Germany will participate together with researchers of the hosting University, along with networking visits to R&DI organizations in Regensburg.

Third Achilles Conference

Gene/cell therapy and clinical applications

8-9 October 2020

Fundação Cupertino de Miranda, Porto, Portugal

The program of the Third Achilles Conference will include keynote lectures, oral and poster presentations by young and experienced researchers and a social program.

In addition, a scientific communication activity will be prepared for the young researchers.



3.1

CONFERENCES AND NETWORKING ATTENDED



RESTORE 1st Advanced Therapies Science Meeting

25-26 November 2019
Berlin, Germany

Prof. Manuela Gomes was an invited speaker in the first RESTORE meeting. RESTORE is an H2020 project with the unifying goal of developing and implementing newly Advanced Therapies in clinical routine to improve patients' outcome.



TERM-STEM Annual Conference

6-8 November 2019
Braga, Portugal

Achilles team participated in the TERM-STEM 2019, which was chaired by Prof. Rui L. Reis and Prof. Manuela E. Gomes. TERM-STEM comprises a series of conferences organized by the 3B's Research Group since 2012 that intends to make a stand in the worldwide range of conferences in the field of Tissue Engineering, Regenerative Medicine and Stem Cells.

Society For Biomaterials Annual Meeting & Exposition

3-6 April 2019
Seattle, USA

Prof. Rui Reis and Dr. Rui Domingues represented the Achilles team at the SFB 2019 in Seattle. Dr. Domingues presented the work "Tendon mimetic magnetic responsive fibrous scaffolds and magneto-mechanical stimulation synergistically promotes the tenogenic commitment of human adipose derived stem cells".



In addition, Achilles team members participated in the following conferences:

- *ICORS/CORS/COA Meeting, 19-22 June 2019, Montreal, Canada*
- *Frontiers in Biomedical Polymers - 13th International Symposium, 19-23 May 2019, Tenerife, Spain*
- *33rd European Immunogenetics and Histocompatibility Conference EFI, 8-11 May 2019, Lisbon, Portugal*
- *MATERIAIS 2019, XIX Congresso da Sociedade Portuguesa de Materiais e X International Symposium on Materials, 14-17 April 2019, Lisbon, Portugal*

Achilles team members visited the following R&D organisations:

- *Prof. R. Stange's Laboratory, University Clinic Muenster, 01-10 March 2019, Muenster, Germany*
- *Prof. H. Clausen-Schaumann's Laboratory, University of Applied Sciences, 19-20 February 2019, Munich, Germany.*
- *Harvard Cutaneous Biology Research Center, Massachusetts General Hospital, Harvard University, 17th June 2019, Boston, USA*

3.2.

CONFERENCES AND NETWORKING ORGANIZATION OF SYMPOSIA

TERMIS European Chapter Meeting

27-31 May 2019
Rhodes, Greece

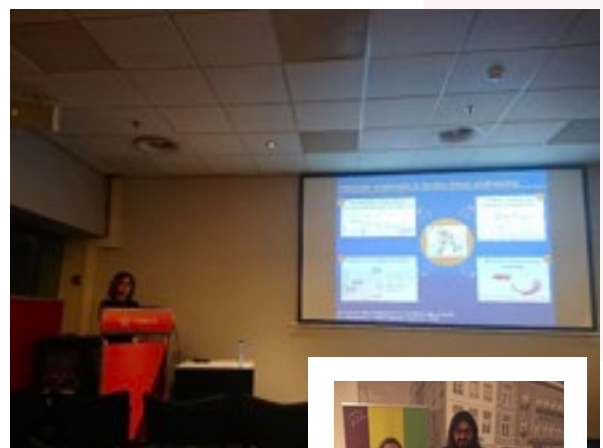
The Tissue Engineering and Regenerative Medicine International Society (TERMIS)-EU chapter 2019 was held in Greece with high representation of the Achilles team and all of its partners. In this conference, a Symposium was dedicated to the **“Achilles Twinning H2020 Project – Overcoming specific weaknesses in tendon biology to design advanced regenerative therapies”**. In addition, Prof. Manuela Gomes was one of the three Keynote lecturers of the Conference with a talk titled **“Magnetically assisted tissue engineering technologies for tendon regeneration”**.



European Orthopedic Research Society Annual Meeting

2-4 October 2019
Maastricht, The Netherlands

A symposium titled “Tendon Pathophysiology – Recent advanced in controlling cell phenotype, function and secretome in vitro and in vivo” was chaired by Prof. Dimitrios Zeugolis (NUIG) and Prof. Manuela E. Gomes (UMINHO) during the European Orthopaedic Research Society Annual Meeting 2019. EORS promotes research and development in orthopaedic surgery and related sciences in Europe. In addition, Achilles partner Prof. Denitsa Docheva (UHREG) was also present at the EORS 2019.



3.3 CONFERENCES AND NETWORKING UPCOMING



José Carreras Center Centrum

July 2020
Regensburg, Germany



FIFA Medical Centre of Excellence

July 2020
Regensburg, Germany



World Biomaterials Congress

19-24 May 2020
Glasgow, UK

3.4.

CONFERENCES AND NETWORKING ORGANIZATION OF SYMPOSIA

TERMIS European Chapter Meeting

26-29 May 2020
Manchester, UK

Symposium titled "Tackling tendon disease: updates on tendon fatigue, degeneration and healing" organized by Prof. Denitsa Docheva (UHREG) and Prof. Manuela E. Gomes (UMINHO).



European Orthopaedic Research Society Annual Meeting

16-19 September 2020
Izmir, Turkey

Symposium "Achilles Twinning H2020 Project – Overcoming specific weaknesses in tendon biology to design advanced regenerative therapies" organized by Prof. Dimitrios Zeugolis (NUIG) and Prof. Manuela E. Gomes (UMINHO).



4.1

DISSEMINATION AND COMMUNICATION PUBLICATIONS

- Encyclopedia of Tissue Engineering and Regenerative Medicine, Reis RL & Gomes ME (Editors), ISBN: 9780128136997, Elsevier, 2019.

<https://www.elsevier.com/books/encyclopedia-of-tissue-engineering-and-regenerative-medicine/reis/978-0-12-813699-7>

- Yin H, Strunz F, Yan Z, Lu J, Brochhausen C, Kiderlen S, Clausen-Schaumann H, Wang X, Gomes ME, Alt V, Docheva D. Three-dimensional self-assembling nanofiber matrix rejuvenates aged/degenerative human tendon stem/progenitor cells. *Biomaterials* (2020), 236, 119802.

<https://www.sciencedirect.com/science/article/pii/S014296122030048X>

- Matos AM, Gonçalves AI, El Haj AJ, Gomes ME. Magnetic biomaterials and nano-instructive tools as mediators of tendon mechanotransduction. *Nanoscale Advances* (2019), DOI: 10.1039/C9NA00615J

<https://3bs.uminho.pt/publication/magnetic-biomaterials-and-nano-instructive-tools-mediators-tendon-mechanotransduction>

- Tsiapalis D, Ribeiro S, De Pieri A, Sallent I, Guillaumin S, Gaspar D, Korntner S, Bayon Y, Gomes ME, Reis RL, Zeugolis DI. Designing microenvironments for optimal outcomes in tissue engineering and regenerative medicine: From biopolymers to culturing conditions. In: *Encyclopedia of Tissue Engineering and Regenerative Medicine*, Reis RL, Gomes ME (editors). Academic Press (2019), 119-130.

<https://3bs.uminho.pt/publication/encyclopedia-tissue-engineering-and-regenerative-medicine>

- Gonçalves AI, Berdecka D, Rodrigues MT, Eren AD, de Boer J, Reis RL, Gomes ME. Evaluation of tenogenic differentiation potential of selected subpopulations of human adipose derived stem cells. *Journal of Tissue Engineering and Regenerative Medicine* (2019), 13, 2204-2217.

<https://3bs.uminho.pt/publication/evaluation-tenogenic-differentiation-potential-selected-subpopulations-human-adipose%C3%A2%E2%82%AC%C2%90d>

- Echave MC, Domingues RMA, Gomez-Florit M, Pedraz JL, Reis RL, Orive G, Gomes ME. Biphasic Hydrogels Integrating Mineralized and Anisotropic Features for Interfacial Tissue Engineering. *ACS Applied Materials & Interfaces* (2019), 11, 47771-47784.

<https://3bs.uminho.pt/publication/biphasic-hydrogels-integrating-mineralized-and-anisotropic-features-interfacial-tissue-e>

- Costa-Almeida R, Calejo I, Gomes ME, Mesenchymal Stem Cells Empowering Tendon Regenerative Therapies, *International Journal of Molecular Sciences* (2019), 20, 3002.

<http://repositorium.sdum.uminho.pt/handle/1822/60696>

- Ribeiro S, Novacek V, Fernandes EM, Gomes ME, Reis RL, Bayon Y, Zeugolis DI. Design and characterization of synthetic biodegradable films for musculoskeletal tissue engineering. In *Orthopaedic Proceedings* (2018) 100, Supp 15, 26-26

<https://3bs.uminho.pt/publication/design-and-characterization-synthetic-biodegradable-films-musculoskeletal-tissue-enginee>

- Special issue at *International Journal of Molecular Science* on "Achilles Curse and Remedy: Tendon Diseases from Pathophysiology to Novel Therapeutic Approaches" is edited by the project partner UHREG. This issue will count with papers from the Keynote invited speakers of the Achilles Conferences.

https://www.mdpi.com/journal/ijms/special_issues/tendon_disease

4.2.

DISSEMINATION AND COMMUNICATION MEDIA

- The website of the Achilles Project is fully operational and open to the public
<https://achilles.i3bs.eu/>.

- UHREG website includes general information about Achilles project
<https://www.ukr.de/kliniken-institute/unfallchirurgie/Forschung/Labor-experimentelle-Unfallchirurgie/Drittmittel/index.php>

- Achilles Twitter account (@AchillesH2020). From its creation in January 2019, it has >130 followers, >100 publications, > 20 pictures and >50.000 impressions.

- Article in the Journal OU Orthopädie und Unfallchirurgie (DGOU Journal (Germany Society of Orthopedic and Trauma Surgery), membership of approx. 15000, 3rd big orthopedic society in the world) readership over 10 000 readers). "Experimentelle Unfallchirurgie, EU-Erfolg für die Regensburger" Aus den Verbänden / DGU, OU Orthopädie und Unfallchirurgie April 2019; 09(2): 64
<https://link.springer.com/article/10.1007/s41785-019-0839-7>

- Press release/Newsletter from the UHREG (Universitätsklinikum, Regensburg) on 04.10.2018:
<https://www.ukr.de/service/aktuelles/05602.php>

- Achilles project further released at:

<https://www.wochenblatt.de/gesundheit/regensburg/artikel/260640/gewebe-aus-stammzellen-eu-forschungsprojekte-der-regensburger-universitaetsmedizin-gestartet>

<http://www.newslocker.com/de-de/region/regensburg/neue-gewebe-aus-stammzellen-kommen-aus-regensburg/>

<https://www.klamm.de/news/neues-eu-forschungsprojekt-regensburger-forscher-wollen-k-nstliche-gelenke-besser-vertr-glich-machen-eine-obx-19N724974.html>

<http://www.gesundheitsjournal24.de/2018/10/18/neues-eu-forschungsprojekt-regensburger-forscher-wollen-kuenstliche-gelenke-besser-vertr-10494/>

<https://www.fair-news.de/1797447/neues-eu-forschungsprojekt-regensburger-forscher-wollen-kuenstliche-gelenke-besser-vertraeglich-machen>

- Program "Our Champions" featured on SIC Noticias TV channel (interview to Prof. Manuela Gomes):

https://www.youtube.com/watch?v=1_jX8RT6LWc&feature=youtu.be

- RTP TV channel documentary on the future of Tissue Engineering and Bioprinting

- RTP Interview to Prof. Manuela Gomes
October 2019 | 3B's Research Group, UMINHO

- Session to celebrate International Day of Women and Girls in Science at I3Bs. The celebration of the day aimed to achieve the equal access and participation in science for women and girls all over the world.

- Review on engineering the musculoskeletal interface featured in Trends in Biotechnology twitter to celebrate the 2020 Women in Science day <https://twitter.com/TrendsInBiotech/status/1227610730318487552>



5. AWARDS



Prof. Rui L. Reis was awarded with the "Career Achievements Award" at the TERMIS-EU 2019 meeting.



Prof. Manuela E. Gomes was awarded with the "Litoral Award" from Litoral Magazine.



European Research Council (ERC) Consolidator Grant awarded to Prof. Dimitrios Zeugolis with the project ACHIEVE: Advanced Cellular Hierarchical Tissue- Imitations based on Excluded Volume Effect.



The ACHILLES project has received funding from the European Union's Horizon 2020 Research and Innovation programme, under the Grant Agreement Number 810850.