

NEWS & RESEARCH

ORAL SURGERY AND DENTAL IMPLANTOLOGY

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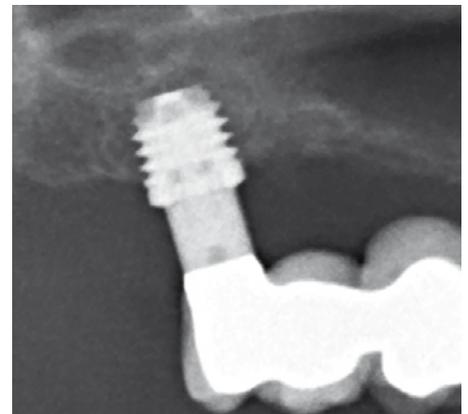
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The crown-implant ratio does not influence the survival of short BTI implants

The *Clinical Implant Dentistry and Related Research* journal, one of the most relevant journals in the field of dentistry, published a BTI study on short and extra-short implants.

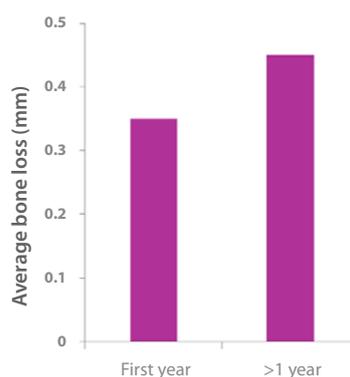
Research laboratory · **Vitoria**

The use of short and extra-short implants creates an unfavourable crown/implant ratio (>1) which may result in poor biomechanical performance, with a potential impact on bone loss and the survival rate of the implants. The aim of this study was to assess the possible influence of the unfavourable crown/implant ratio, as well as other variables, on the clinical results of the short implants.



Short BTI implants The radiographic examination shows the correct function of the short BTI implants and the prostheses when the implant/crown ratio is greater than 1.5.

The average bone loss was 0.35 mm the first year and 0.45 mm after the first year of loading



and 0.45 mm after the first year of loading. Not one implant failed (100% survival rate). The only variable that showed a negative impact on bone loss was the use of cantilevers ($p < 0.05$). The rest of the variables, including the crown/implant ratio or crown height, did not have a direct effect on bone loss.

In view of this information, we can expect satisfactory clinical results with the use of short implants in disproportionate prosthetic rehabilitation. Only in those cases in which cantilevers are used can we expect higher bone loss values, and therefore a higher risk of implant failure.

The study analysed 128 short and extra-short BTI implants placed in 63 patients, whose crown/implant ratio was considered to be "unfavourable" (>1, average ratio 1.82). The average bone loss was 0.35 mm the first year

CLINICAL IMPLANT DENTISTRY and Related Research

REFERENCE: Anitua E, Piñas L, Orive G. Retrospective study of short and extra-short implants placed in posterior regions: influence of crown-to-implant ratio on marginal bone loss. *Clin Implant Dent Relat Res*. 2013 (In Press).

CONSERVATIVE TECHNIQUE

"New technique for the treatment of severe atrophy in the posterior mandible"

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EFFICACY

PRGF-Endoret® in the prevention of bisphosphonate-related osteonecrosis

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NEWS

"PRGF-Endoret® clot proteomic study"

(PAG. 4)



DR. FELIPE PROSPER

"PRGF-Endoret® shows a significant pro-angiogenic effect"

(PAG. 6)

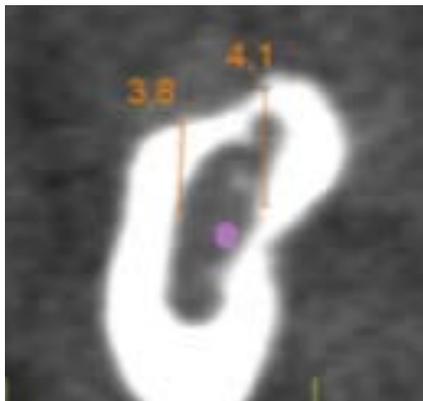
New technique for the treatment of severe atrophy in the posterior mandible

The International Journal of Oral & Maxillofacial Implants recently published an article about a new conservative technique for the restoration of severe atrophic mandible, which avoids the need for major surgical reconstruction.

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The technique includes a biological drilling protocol of the mandibular bone which has been carried out in two stages: conventional drills are used in the first stage; in the second stage a new high-precision front cutting drill is used to prepare the last millimetre of the alveolus, maintaining the cellular viability of the area. The use of PRGF-Endoret® to bind the bone graft particles together and ensure stability around the implant makes supra-alveolar bone formation possible.

The article includes the results of a study in which 114 extra-short implants were placed in 72 patients, with an average follow-up time of 26 months. During this period, the surgi-



This technique encourages vertical bone growth around extra-short implants and improves adhesion and stability

cal morbidity was minimal, without impairing the function of the inferior dental nerve. The survival rate of the implants was 98.4%, with no prosthetic complication.

The study concludes that extra-short implants are an alternative which is minimally invasive and effective in the prosthetic rehabilitation of the severely atrophic maxilla.

EXTRA-SHORT IMPLANTS. A conservative alternative that is simple and effective in the treatment of severe atrophy in the posterior mandible.

JOMI

REFERENCE: Anitua E, Alkhraisat M, Orive G. Novel technique for the treatment of severely atrophied posterior mandible. International Journal of Oral & Maxillofacial Implants. 2013 (In Press).

Efficacy of PRGF-Endoret® in the bone regeneration of post-extraction sockets

Antonello et al. have carried out a bilateral randomised clinical trial to determine the effect of plasma rich in growth factors (PRGF-Endoret®) on the bone regeneration of the third molar post-extraction socket.

News & Research · **Italy**

A total of 25 patients, requiring the removal of all third molars, were recruited for the study. The dental extraction was performed in two sessions 15 days apart. Two third molars (upper and lower) were extracted from one side during the first session, whereas the molars on the opposite side were extracted during the second surgical session. The treatment given (PRGF-Endoret® clot or blood clot) was randomly assigned. Periapical x-rays were taken 1, 3 and 5 months after surgery.

The bone density comparison between the two treatments indicates that PRGF-Endoret® significantly improves post-extraction bone regeneration in both the mandible and maxilla. This difference was greater in the maxilla than in the mandible, probably due to the less compact bone structure and increased blood flow. The authors concluded that PRGF-Endoret® is a safe and effective tool to accelerate alveolar bone regeneration.

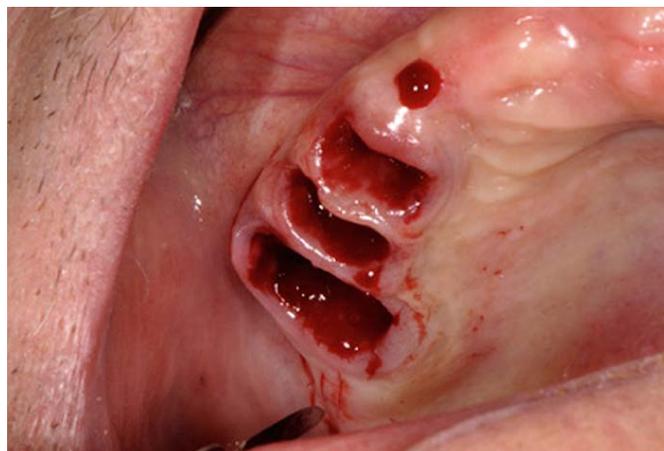


PRGF-Endoret® Clot application in the regeneration of the extraction socket.

Journal of
**Cranio-Maxillo-Facial
Surgery**

REFERENCE: Antonello GD, Torres do Couto R, Giongo CC, Corrêa MB, Chagas Júnior OL, Lemes CH. Evaluation of the effects of the use of platelet-rich plasma (PRP) on alveolar bone repair following extraction of impacted third molars: Prospective study. J Craniomaxillofac Surg. 2013 (In press).

PRGF-Endoret[®], in the prevention of osteonecrosis related to the use of bisphosphonates



CLINICAL CASE Efficacy of PRGF-Endoret[®] in the treatment of extraction sockets in patients treated with bisphosphonates, minimising the risk of developing osteonecrosis of the jaw associated with the use of these medications.

The efficacy of plasma rich in growth factors (PRGF-Endoret[®]) to prevent bisphosphonate-related osteonecrosis is gaining interest in the scientific community.

News & Research · Italy

Scoletta et al. have published a prospective study based on the use of PRGF-Endoret[®] (without raising a mucoperiosteal flap) in the treatment of extraction sockets in patients who take or have taken intravenous bisphosphonates.

Patients included in the study had tartar removed from their teeth and received oral

hygiene instructions and antibiotic treatment. An atraumatic extraction was then performed followed by ultrasonic surgery to clean the extraction socket and some osteoplasty of the alveolar ridge. Lastly, the extraction socket was filled with the PRGF-Endoret[®] clot and covered with a fibrin membrane.

In total, 202 extractions were performed on 63 patients (54.95 % of them in the jaw). The results showed that the oral mucosa healed properly in 62 of the 63 patients and the radiographic analysis performed after 6 months showed normal bone regeneration, concluding that the treatment with PRGF-Endoret[®] is effective in the prevention of osteonecrosis in this type of patients.

The results show that in 62 of the 63 patients the oral mucosa healed properly

European Journal of Oral Implantology

A letter was sent, entitled "Rigorous methodology is the school of coherent conclusions in science"; underlining the importance of methodological rigour in the study of the dynamics of bone formation in the extraction socket.

The letter sent to the EJOI editor pointed out several serious flaws in the study conducted by Farina et al. (Farina Retal. Clin Oral Implant Res 2012 In Press), when they studied the effect of PRGF-Endoret® on early bone formation in extraction sockets.

These flaws included the lack of subject randomisation and the lack of uniformity in the groups, since the number of patients who smoke and teeth extracted due to destructive periodontitis were significantly higher in the group treated with PRGF-Endoret®.

From this letter we can conclude that PRGF-Endoret® mitigates the negative effect that smoking and periodontitis may have on early bone regeneration.



REFERENCE: Anitua E, Alkhraisat MH, Orive G. Rigorous methodology is the school of coherent conclusions in science. Eur J Oral Implantol 2013;6:9-11.

PRGF-Endoret® reduces the complications in sinus elevation

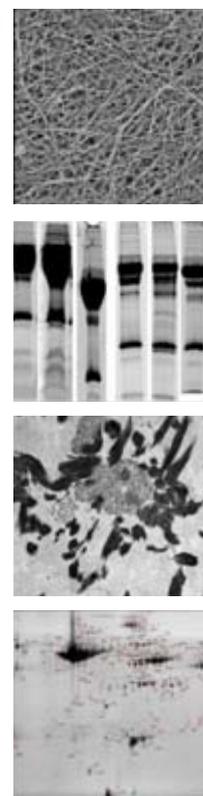
Dr. del Fabbro's team has published a study in the Journal of Oral Implantology which presents an innovative technique using PRGF-Endoret® in the treatment of perforations of Schneider's membrane produced during maxillary sinus elevation.

The study describes 8 sinus elevations; two resulted in perforations of Schneider's membrane, which were resolved applying an PRGF-Endoret® clot before placing the graft. In the 8 cases studied, the quality of life of the patients after the surgical procedure was good, with the exception of one patient who experienced pain after acute sinusitis.

The study confirms that the use of PRGF-Endoret® can reduce complications after sinus elevation surgery.



REFERENCE: Taschieri S, Corbella S, Del Fabbro M. Use of plasma rich in growth factor for schneiderian membrane management during maxillary sinus augmentation procedure. J Oral Implantol. 2012;38:621-627.



PROTEIN CONTENT The PRGF-Endoret® clot is characterised by electron microscopy techniques, including scanning, transmission and high-throughput proteomic methods.

A proteomic study shows the advantages of the PRGF-Endoret® fibrin clot

The Journal of Tissue Engineering and Regenerative Medicine has accepted a study that provides the first proteomic characterisation of the PRGF-Endoret® fibrin clot.

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Through this proteomic study it was possible to confirm that in the fibrin matrix obtained from PRGF-Endoret®, more than a hundred proteins were "trapped" which were not released by the supernatant, instead getting caught in the mesh.

Many of the proteins trapped in the fibrin matrix are specifically involved in tissue regeneration and wound healing. Furthermore, an enrichment has been found in certain lipoproteins which would slow down the degradation of the fibrin network, increasing the release of growth factors in time. There are also proteins

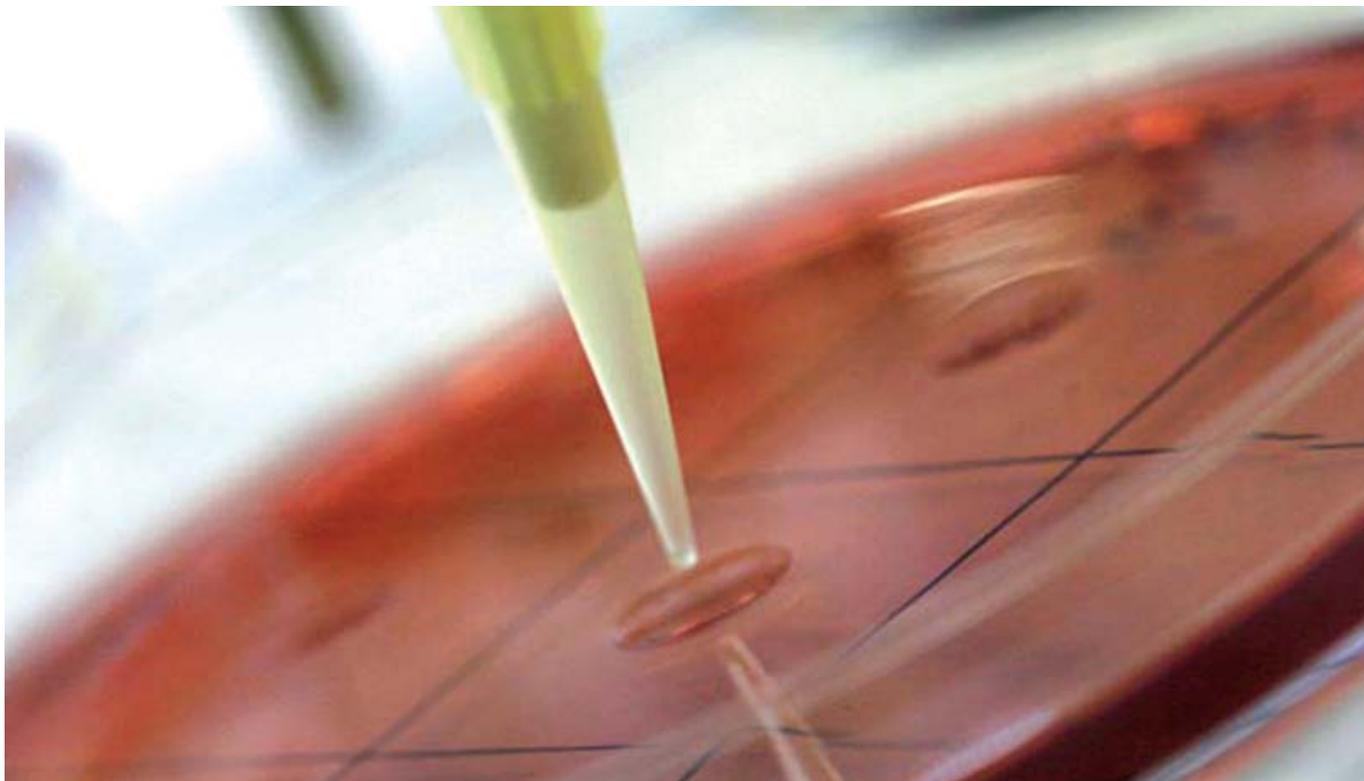
involved in the acute-phase reaction, the first line of defence of the innate immune system.

It has therefore been demonstrated that the PRGF-Endoret® clot, with its high protein content, has great advantages when used in tissue repair processes, opposed to artificial fibrin clots obtained from fibrinogen and thrombin, which do not contain the proteins directly involved in the regeneration process.

The PRGF-Endoret® clot, with its high protein content, has great advantages when used in tissue repair processes



REFERENCE: Anitua E, Prado R, Azkargorta M, Rodriguez-Suárez E, Iloro I, Casado-Vela J, Elortza F, Orive G. A high-throughput approach to plasma rich in growth factors (PRGF-Endoret) fibrin interactome. Journal of Tissue Engineering and Regenerative Medicine 2013 (In Press).



PRGF-ENDORET® presents bacteriostatic and bactericidal effects against different bacterial strains.

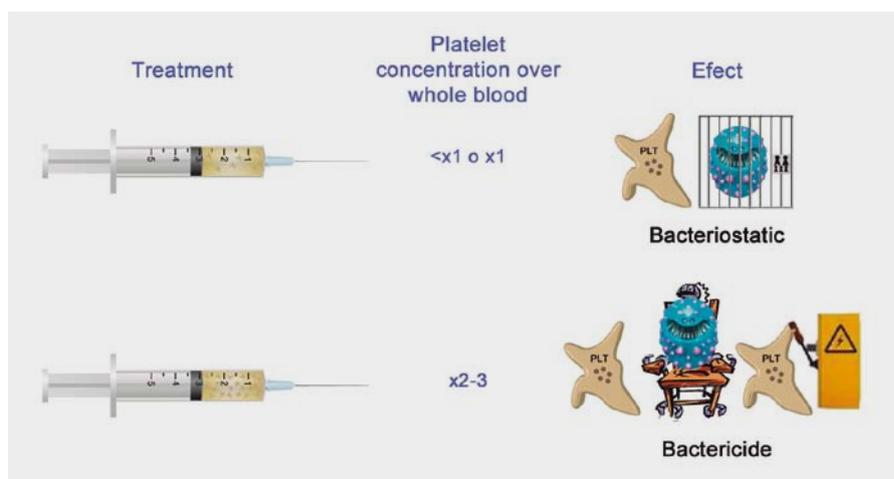
Anti-microbial effect of PRGF- Endoret® in microorganisms isolated from the oral cavity

The BMC Microbiology journal recently published an article that reinforces the use of PRGF-Endoret® technology in oral surgery procedures. The authors of the article assessed the bacteriostatic potential of plasma rich in growth factors to respond to different strains of microorganisms that favour the development of oral infections.

News & Research · Italy

This study analysed the minimum concentration of platelets necessary to obtain a bacteriostatic and bactericidal effect in 4 species of microorganisms (*E. faecalis*, *C. albicans*, *S. agalactiae* and *S. oralis*) isolated from oral and dental infections in a total of 17 patients.

The results showed that it was possible to inhibit the growth of all the strains studied (bacteriostatic effect) to platelet concentrations 3 or 4 times lower than those observed in the PRGF-Endoret® samples. The



most relevant aspect of this study is that, except for *C. albicans*, PRGF-Endoret® technology has a bactericidal effect on the other strains studied in its platelet concentration (2-3 times the platelet concentration compared with blood).

PRGF-Endoret® technology has a bacteriostatic effect



BTI BIOTECHNOLOGY INSTITUTE has created an evaluation committee to promote quality research.

Evaluation committee for scientific projects

News & Research · **Vitoria**

Scientific research is fundamental, not only as a vehicle to promote technological and scientific advances that improve the quality of life of our patients, but also as the foundation to build a prosperous and advanced society. The BTI Biotechnology Institute research team is working to promote quality scientific research.

As of May 2013, an evaluation committee for scientific projects will be set up to analyse all

the research proposals (both basic and clinical) sent to BTI.

The main objective of the evaluation committee will be to thoroughly review and evaluate scientific proposals and to improve response times, promoting projects of the highest scientific quality.

Any proposal that promotes research into BTI developments in any of the areas currently being developed or for later development can be sent to research@bti-implant.es for evaluation.

EACH RESEARCH PROJECT MUST CONTAIN:

- 1) The state of the art
- 2) Objectives
- 3) Necessary materials and methods or clinical protocol
- 4) Timetable
- 5) Estimated budget
- 6) CV and experience of the authors

Editorial NEWS & RESEARCH



Dr. Felipe Prósper

Dr. Felipe Prósper graduated in Medicine and Surgery at the University of Navarra in 1989, specialising in Haematology, and completed his doctorate in 1994. He later held a Fellowship at the University of Minnesota from 1994 to 1997, receiving a degree in Oncology. He is currently the Director of Cell Therapy and Co-Director of the Haematology Department at the University Hospital of Navarra.

PRGF-Endoret® shows a significant pro-angiogenic effect

His work is focused on the diagnosis and treatment of haematological diseases, namely myeloma and leukaemia. His research is focused on two main areas: epigenetic regulation of malignancies (leukaemia and myeloma) and cell therapy with adult stem cells in cardiovascular diseases.

Physiologically, in the wound healing process, clot formation plays a critical role. The platelets are an essential part of this clot and contribute to the activation of the coagulation, but they release different factors that help healing and the angiogenesis and vasculogenesis processes. Not surprisingly, the compounds derived from platelet-rich plasma (PRP), and in particular from PRGF-Endoret®, could have a significant pro-angiogenic effect. Whereas there is considerable experience in the use of PRP to enhance tissue regeneration and healing, there are far fewer studies in which the role of PRP in ischaemic pathologies, such as heart attack or peripheral ischaemic disease, is directly addressed.

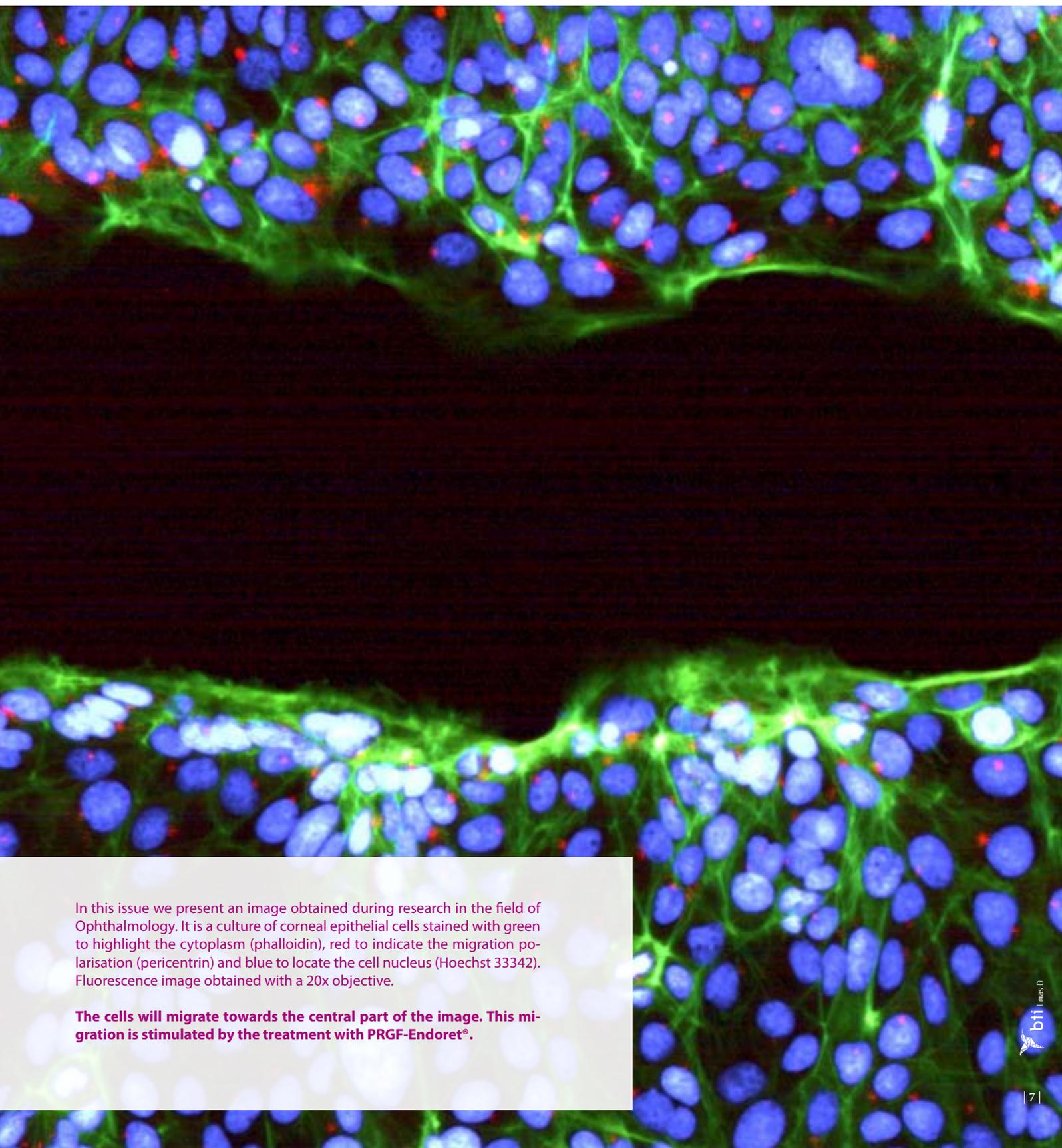
The work recently published by Eduardo Marban's group (J Am Coll Cardiol 2012; 59:256-64) therefore had a particular interest in showing how the application of PRP gel is able to contribute to the repair process after myocardial infarction in a rat model, due to its ability to stimulate the activation of endogenous progenitor cells and promote neovascularisation.

In the same vein, our group obtained results in rat models of peripheral ischaemia which suggest that highly prevalent diseases, such as heart attack or limb ischaemia, are potential new applications for PRP which should be explored in depth.

LABORATORY IN FOCUS



Each copy will provide a representative image of the research carried out by the regenerative medicine laboratory at the BTI Biotechnology Institute. These images can be obtained from the laboratory itself (in vitro preclinical research), from animal testing (in vivo preclinical research), or could be related to a clinical trial.



In this issue we present an image obtained during research in the field of Ophthalmology. It is a culture of corneal epithelial cells stained with green to highlight the cytoplasm (phalloidin), red to indicate the migration polarisation (pericentrin) and blue to locate the cell nucleus (Hoechst 33342). Fluorescence image obtained with a 20x objective.

The cells will migrate towards the central part of the image. This migration is stimulated by the treatment with PRGF-Endoret®.