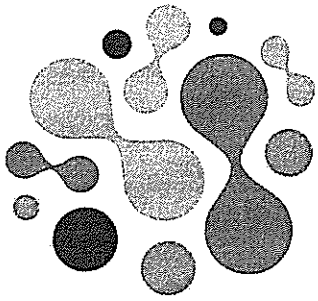

ICVS/3B's

Associate Laboratory

University of Minho

III ICVS/3B's – Associate Laboratory Meeting

Braga, June 28th, 2013

Morning Period:

09H00 – 09H15 Opening Session: António Cunha (Reitor da UMinho)

09H15 – 09H45 Scientific Outputs of the ICVS/3B's LA: Rui L. Reis/Jorge Pedrosa

09H45 – 11:00 Round table: A view of the Past, Present and Future of the ICVS/3B's – *a Perspective from the ICVS*

Nuno Sousa: "Challenges and Frontiers for Biomedical Research"

11H00 – 12H30 Poster Session 1 (**P01-P31**): Ongoing Research – a *Perspective from the 3B's*

(Coffee Break will be served at the beginning of the Poster Session)

12H30 – 14H00 *Lunch*

Afternoon Period:

14H00 – 15H00 Presentations on previous "out of the box" ideas – revisited (**OB01-OB04**)

- Rui Costa
- Iva Pashkuleva
- Alexandre Barros
- João Vilaça

15H00 – 15H45 Presentations of new "out of the box" ideas (**OB05-OB08**)

- Hélder Pereira
- Mariana Oliveira
- Jorge Correia Pinto
- Luísa Pinto

15H45 – 16H30 Poster Session 2 (**P32-P39**): Ongoing Collaborative Work at the ICVS/3Bs

(Coffee Break will be served at the beginning of the Poster Session)

16H30 Closing Remarks

P01

PIEZOELECTRIC PHBV B

Alessandra Zonari[1,2,3*], Márc
Alexandra P. Mar

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Minho, Headquarters of the Eurc
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[4] Department of Nephrology, Fec

Being piezoelectric, the natural
hydroxyvalerate (PHBV) has the
to mechanical strain. Therefore,
an innovative skin tissue engine
Bilayered PHBV scaffolds were
drying methodologies, to produc
structure recreating the epiderm
the two structures allowed attain
withstand the stresses that o
diminishing wound contraction.
weeks in the presence of lipas
human keratinocytes (hKc) and
in the respective layer of the bila
of the cells along the time of cul
the respective support structure
after achieving confluence, hKc
epidermis expressing involucrin,
layer. A bilayered skin substit
epidermal analogs was successf
piezoelectricity character of the P
wound healing.

P10

PEPTIDE LIGANDS IDENTIFIED BY PHAGE DISPLAY TECHNOLOGY TO DEVELOP A TARGETED NANODELIVERY SYSTEM FOR CARTILAGE THERAPIES

Ivone M. Martins[1,2], Rui C. Pereira[1,2], Leon. D. Kluskens[3], Joana Azeredo[3], Rui L. Reis[1,2], Helena S. Azevedo[1,2]

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3- IBB-Institute for Biotechnology and Bioengineering, Centre of Biological Engineering, University of Minho, Braga, Portugal

Osteoarthritis (OA) is the most common joint disorder in western populations. Its incidence increases with age, being a major problem in ageing populations. This disease is characterized by a progressive degradation of articular cartilage, leading to loss of joint mobility and function accompanied by chronic pain. There is a great interest on the development of a strategy for targeted OA therapy. The identification of molecules expressed exclusively, or at elevated levels, by OA cartilage cells (chondrocytes) can provide a strategy for targeted OA therapy by enhancing drug specificity. Towards this goal, we report the identification of peptide ligands, that bind selectively and with affinity to OA chondrocytes, using phage display technology in which a library of phage particles expressing a wide diversity of peptides is screened to identify those that bind the desired target [1]. Healthy and OA chondrocytes for the panning experiments were isolated from cartilage samples obtained in local hospitals under pre-established agreement and from patients after informed consent. Isolation and expansion of chondrocytes was performed according to published procedures [2,3] and their phenotype was characterized by FACS (CD44, CD26, CD10 and CD95) and RT-PCR (aggrecan, collagen I, II and X and sox9). The identified peptide sequence is currently being integrated into nanocarrier systems formed by self-assembling approaches and the potential of these targeted delivery systems will be tested *in vitro*. This approach, if successful, will yield important insights into the regenerative mechanisms of cartilage and could be applied for developing more efficient and less invasive therapies for treating OA.

[1] R.J. Giordano, M. Cardó-Vila, J. Lahdenranta, R. Pasqualini, W. Arap, *Nature Medicine* **7**, 1249 (2001).
[2] R. C. Pereira, C. Gentili, R. Cancedda, H.S. Azevedo, R.L. Reis, *Methods in Molecular Biology* **695**, 167 (2011).
[3] M. Malpeli, N. Randazzo, R. Cancedda, B. Dozin, *Tissue Engineering* **10**, 145 (2004).

P11

PREPARATION OF

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Several materials are being st
collagen, being the most abu
polymers to be considered. Th
skin but those sources are fac
being hindered by religious
pursued and besides the mo
organisms are being considere
collagen, and being a fish-
environmental benefits [1,2].
(Scyliorhinus canicula) skin b
soluble collagen (ASC). The c
biomedical applications, with fo
acid solutions following a solv
hexamethylene diisocyanate (
medium. The crosslinking ef
ninhydrine assay. Moreover,
(tensile tests), wettability and
evaluated. Collagen membrane
by changing the processing co
and the time of crosslinking
delivery device, wound dressing

[1] Silva TH, Alves A, Ferreira B
SS, Mano JF, and Reis RL, "
ceramics of biomedical interest"
[2] Silva T. H., Duarte A. R.
"Biomaterials from Marine-C
Biomaterials Development, pp. 3