

extracellular peptides to CD4+ T cells. Although the HLA-DR requirement for the accessory molecules invariant chain (Ii) and HLA-DM is well established, less is known about how allelic variability affects HLA-DR assembly in the endoplasmic reticulum (ER), or whether HLA-DP and HLA-DQ assemble in the same way as HLA-DR. Here, we ask if different DRB chains influence the stability of the DR α complex against the same intracellular background. We also compare the assembly of HLA-DR with HLA-DP and HLA-DQ. Our findings raise the possibility that, under certain circumstances, HLA-DP may present non-classical peptides to the immune system.

Email Address for correspondence: m.j.t.m.van-lith@durham.ac.uk

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DNA content, immunophenotype, proliferation, plasticity and clonogenic potential of human adipose-derived stem cells after short-, medium- or long-term culture

Nance B. Nardi (Universidade Luterana do Brasil), Roberto C. Chem (Santa Casa de Porto Alegre), Luis A. Costa (Santa Casa de Porto Alegre), Carolina Franke (Santa Casa de Porto Alegre), Melissa Camassola (Universidade Luterana do Brasil)

The adipose tissue contains a stromal population composed of microvascular endothelial cells, smooth muscle cells and stem cells, which can be enzymatically isolated. The adherent, mesenchymal-like cells that establish under appropriate culture conditions, termed adipose tissue-derived stem cells (ADSCs), have extensive proliferative potential and may undergo multilineage differentiation. They are currently considered as one of the most promising type of adult stem cell for therapeutic applications. In this study, we characterized human ADSCs submitted to different periods of culture: short-term (1–9 passages), medium-term (10–19 passages) and long-term (>20 passages) ($n=5$ cultures each). Doubling population indices were significantly higher for long-term and particularly for medium-term cultures when compared to short-term cultures. The clonogenic potential of the cultures, analyzed by limiting dilution, was lower in older cultures. Cell plasticity was analyzed by inducing adipogenic, chondrogenic and osteogenic differentiation of cultures. The differentiation potential was similar in short- and medium-term cultures, but showed a decrease in cultures older than 22 passages. The immunophenotype, typical of ADSCs, was the same in the three types of culture. The DNA content was analyzed by flow cytometry, and was also unaltered ($2n$) in all cultures. These results show that human ADSCs can be maintained in culture for prolonged periods of time, but that long-term cultures lose some of the potential for therapeutic applications, as shown by decreased plasticity and clonogenic potential.

Email Address for correspondence: nance.nardi@ulbra.br

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Poster Session – Tuesday 30th June 2009

UV-absorbing compounds extracted from the Persian sturgeon caviar and *Artemia urmiana* cysts and their UV protective effects on human skin fibroblasts

Saber Khodabandeh (Tarbiat Modares University Marine Biology Group), Mehrdad Noruzinia (Tarbiat Modares University Hematology Group)

Ultraviolet radiation (UVA=320–400 nm, UVB=280–320 nm and UVC=200–280 nm) has significant effects on aquatic animal eggs and larval survival, DNA damage, and oxidative stress level. UV radiation can also accelerate human skin aging and increase the incidence of skin cancer. Mycosporine-like amino acids (MAAs) are ultraviolet-absorbing ($\lambda_{max}=309–360$ nm) molecules that are synthesized by cyanobacteria, algae, fungi and bacteria. These compounds also have been extracted from several marine plants and animals. In this study, the UV-absorbing compounds extraction from Persian sturgeon caviar and *Artemia urmiana* cysts and their protective effects on human skin fibroblast against UV light were investigated. We identified three UV-absorbing compounds (mycosporine-glycine, shinorine and palythine) as MAAs in the cysts and caviar. Mycosporine-glycine and palythine were the most common MAAs among in *Artemia* cysts and caviar, respectively. We observed the protective effects of these compounds on human fibroblast from UV-induced death. The mycosporine-glycine was more effective than shinorine and palythine. Our results suggest that accumulation of MAAs in *Artemia* cysts can protect them during long dormancy period and can also protect the sturgeon embryos from UV radiation during developments. We also observed that these MAAs can possess the UV protective effects on human fibroblast in laboratory condition and they can use in cosmetics products as sunscreen.

Email Address for correspondence: surp78@yahoo.com

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Interplays of metalloproteinase and tissue inhibitors of metalloproteinase in the rapid atrial pacing atria

Chih-Sheng Lin (Department of Biological Science and Technology, National Chiao Tung University, Taiwan)

Extracellular matrix remodeling in cardiac atrium has been characterized in atrial fibrillation (AF) and considered to be a major contributor to AF persistence. In the AF disease, our aim is to test whether altered expression of extracellular matrix metabolized enzymes or their interplays is associated with the disease. In the porcine atria with AF induced by rapid atrial pacing for 3–4 weeks, a significantly greater percentage of ECM, increased matrix proteins (including collagen, fibronectin-1 and fibrillin-1), and the changes of the activity of matrix metalloproteinase (MMPs) and tissue inhibitors of MMPs (TIMPs) were identified. The significant increase of MMP-9, but not MMP-2, in its latent form and mRNA level was demonstrated to be responsible for the significantly increased gelatinase activity in the atria with AF. Furthermore, the inhibitory activity of glycosylated TIMP-1 and -3, but not TIMP-2, in the AF tissues was markedly elevated. Of remarkable interest, TIMP-1 was found to be mostly colocalized with gelatinase activity over the AF tissues, implying the coexistence of gelatinase activity and TIMP-1; however, TIMP-3 appeared only partial colocalization, revealing that TIMP-1 and TIMP-3 may play a differential role in inhibiting the gelatinase in vivo. Together with the results found in the fibrillating atria, we concluded that the MMPs/TIMPs interplay may contribute to the atrial ECM remodeling of AF. Upon further study, we have demonstrated that MMPs/TIMPs balancing regulation in heart is highly related to angiotensin converting enzyme (ACE)-angiotensin II axis and angiotensin converting enzyme 2 (ACE2)-angiotensin 1–7 axis pathways.

Email Address for correspondence: lincs@mail.nctu.edu.tw

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