Lcn-2 Over-expressing Bone Marrow-Derived Macrophages promote Renal Regeneration

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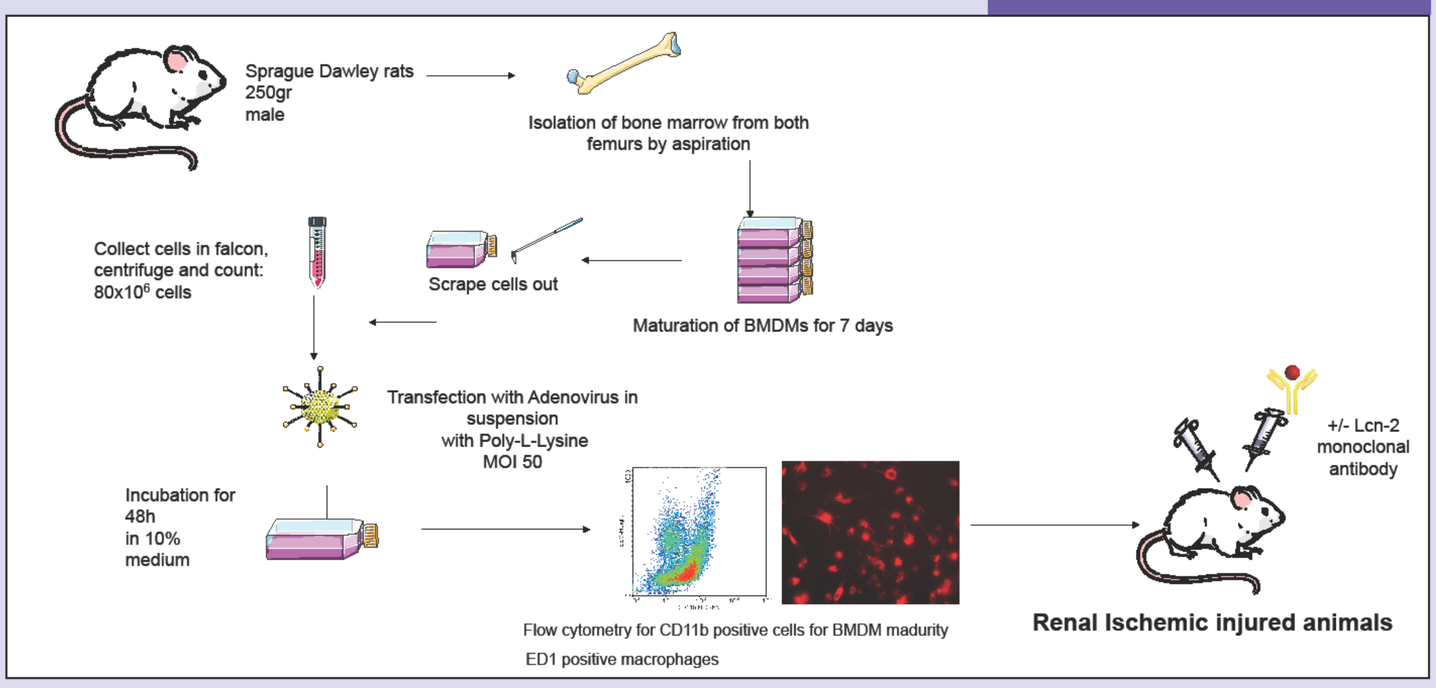
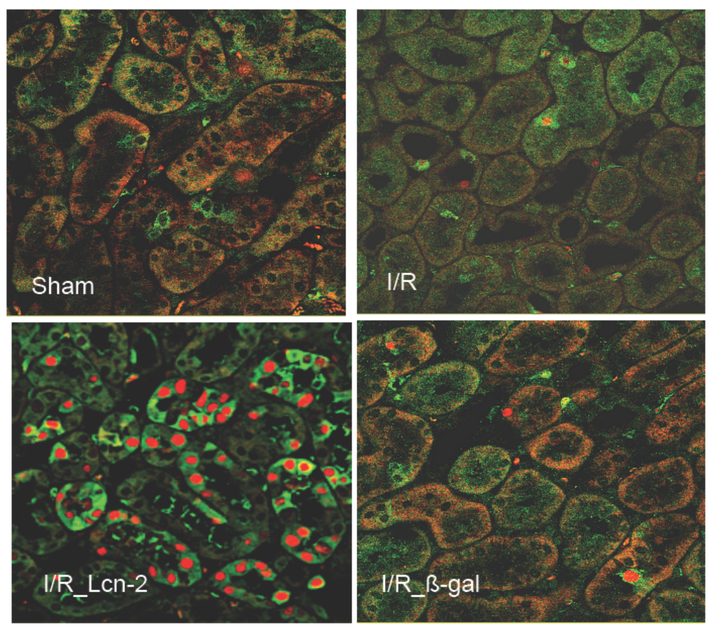
Objectives:

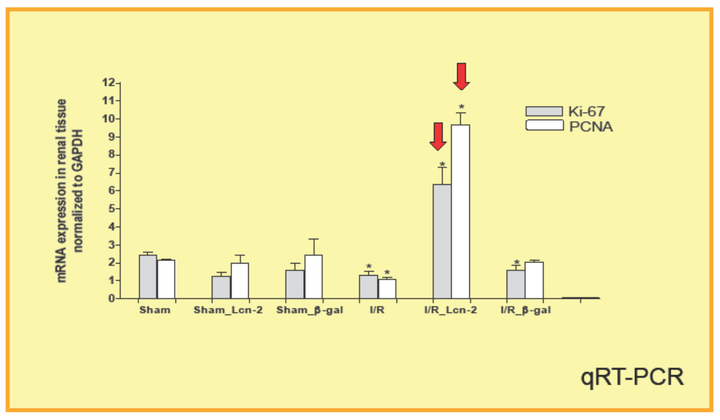
To develop a genetic cellular therapy for *in vivo* applications using M2 macrophages over-expressing Lcn-2

Methods:

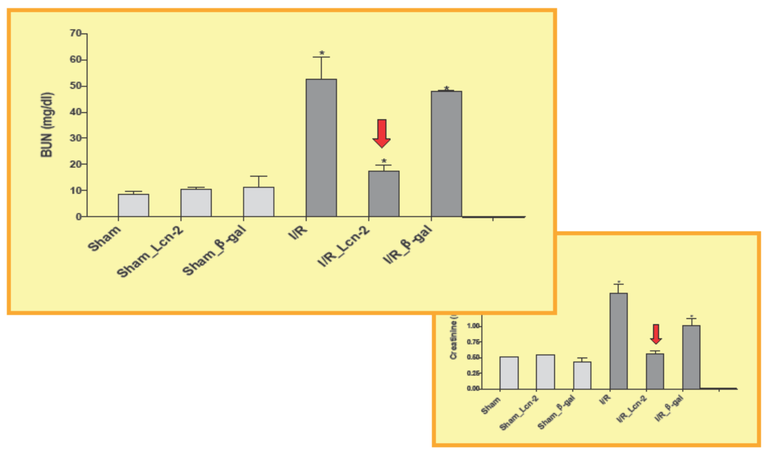


1.- Regenerative markers are over-expressed upon Lcn-2-macrophage cell therapy

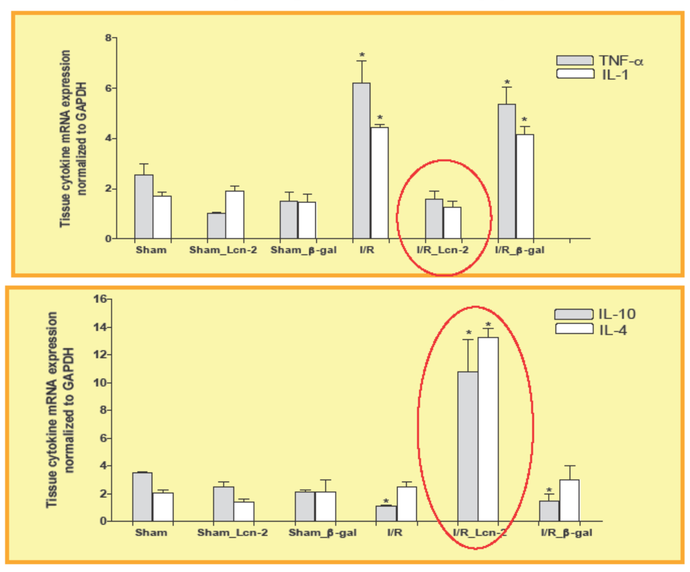




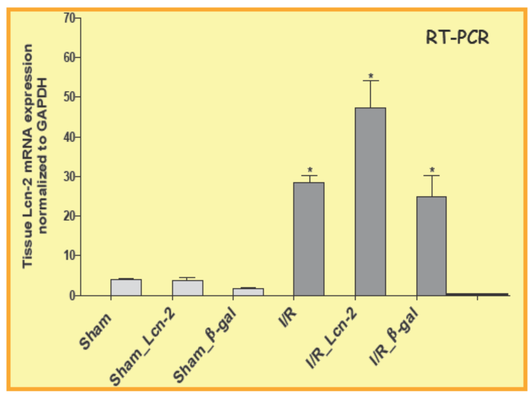
2.- Functional parameters



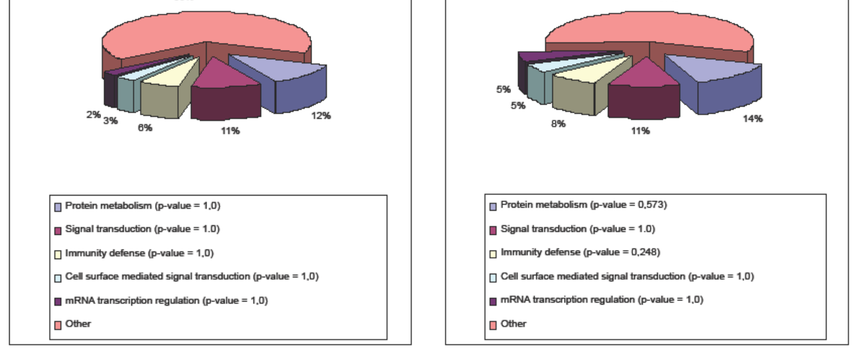
3.- Lcn-2-macrophage cell therapy modulates tissue inflammation



4.-Lcn-2-macrophage cell therapy promotes Lcn-2 synthesis in the tissue



5.- The cell therapy modulates the expression of genes in the kidney



Results:

1.- Animals transferred with macrophage-derived Lcn-2 exhibited a special proliferation and repair ratio of tubular epithelial cells. Immunostaining for the regeneration markers stathmin and PCNA showed markedly positive expression in the kidney sections with Lcn-2-BMDM treatment. Real-Time RT-PCR of the proliferation markers Ki-67 and PCNA further confirmed these effects.

2.- Renal function markers BUN and creatinine were decreased upon adoptive transfer of these macrophages and the expression of pro-inflammatory mediators was attenuated.

3.- BMDM overexpressing Lcn-2 presents a pro-reparative phenotype and promote additional Lcn-2 production in the targeted tissue

4.- The recovered renal tissue treated with Lcn-2-BMDM modulates a different genetic expression compared to the damaged tissue or the one treated only with BMDM and provides a significant resistance to ischemic damage.

Conclusions:

We have developed a novel

genetic cell therapy for kidney repair based on macrophage -Lcn2-overproduction that:

1.- promotes **regeneration** and protection against ischemia /reperfusion injury

2.- re-establishes the **anti-inflammation** miliey after injury

3.- **modulate the expression of genes** in the injured tissue towards repair

References:

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