SUPPLEMENTARY MATERIAL

FIGURE LEYENDS:

Figure S1: A) Images of the AdMSCs and AdMSCs-IFNß (1Hit, 2 Hits, 3Hits) cultures showing the morphology of the cell populations. Images from passages 6 (P6) to 10 (P10) show that all plastic adherent cell lines have a fibroblastic morphology and expand primarily over the surface of culture dishes (original magnification 10X).**B) Doubling times of the AdMSC and and AdMSCs-IFNß populations.** Comparison of the growth potential between the untransduced AdMSC and transduced AdMSC populations at passages (P) 6–10. Population doubling times (*DT*) were calculated using the Schwartz formula. Table shows the mean ± SEM (standard error of the mean) of DT values obtained from the cell cultures of three replicate plates of each experimental condition per passage. Data are expressed in hours (h). **C) Expression of stromal and hematopoietic markers in the AdMSCs and AdMSCs-IFNß populations by flow cytometry**. Graphs show the average (mean) of each CD marker expression percentage value ± standard error of the mean at passages 6 to 10. The Mann–Whitney U test was performed to compare the expression between cell cultures. No statistically significant differences were found between groups.

Figure S2: AdMSCs and AdMSCs-IFNß differentiation. Images show the cell populations at culture passages 7 (P7). Cell cultures were maintained in the growth media (Control) and stimulated to differentiation (Diff.) by incubation with the specific media. **A) Adipogenic induction.** Adipogenic phenotype was confirmed by staining cells with an Oil Red-O solution and counterstaining with hematoxylin and eosin. Adipocytes showed a high percentage of round cells with lipid vesicles occupying the cytoplasm, which is consistent with the phenotype of mature adipocytes (original magnification, 20×). **B) Osteogenic induction.** Osteoclast **l**ed to

dense nodules from which radiated highly elongated spindle-shaped cells, and were characterized by Alizarin Red staining, which stain cell calcium deposits (original magnification, 10×). **C) Chondrogenic induction.** Differentiated chondrocytes were positively stained by Alcian blue, specific for the glycosaminoglycans in cartilage matrix (original magnification, 10×).

Figure S3: Analysis of the CD8$^+$ T cell splenic content. A-D) No differences were found between groups in the percentage of CD8$^+$ T cell content respect to total splenocytes **(A, C),** and between the different CD8$^+$ cell subsets **(B, D),** both in RR-EAE **(A-B)** and CP-EAE mice **(C-D)**. Kruskal-Wallis test was used for the statistical analyses.

Figure S4. Effects of Cell and Gene therapies in neurohistopathological damage in CNS. A) As autologous transplant. Effects in Olig2 positive oligodendrocyte populations and NeuN positive neural population, in the spinal cord of RR-EAE mice at the peak of the second relapse (45 dpi). Graphs show the mean ± standard error of the mean of the number of Olig2 and NeuN positive cells in 200 μ^2 from 3-4 slices of 5-6 animals per experimental group. **B) As allogenic transplant.** Effects in activated microglia, Olig2 positive oligodendrocyte populations and NeuN positive neural population, in the spinal cord of CP-EAE mice at chronification period (35 dpi). Graphs show the mean ± standard error of the mean of the number of activated microglial cells, Olig2 and NeuN positive cells in 200 μ^2 from3 slices of 5-6 animals per experimental group. Kruskal-Wallis test was used for the statistical analyses.