of a real-time RT-PCR analysis (COLI: up to 1.3- and 1.1-fold difference with *sox9* and TGF-β, respectively, using the highly grafted scaffolds and up to 5- and 1.4-fold difference, respectively, using the non-grafted scaffolds, all *versus* control treatment; COLX: up to 3.3- and 1.3-fold difference, respectively, using the highly grafted scaffolds and up to 2.5- and 1.1-fold difference, respectively, using the non-grafted scaffolds; always $P \leq 0.001$) showing overall more advantageous effects of *sox9* gene transfer and pNaSS grafting (Fig. 3).

Conclusions: Gene delivery of therapeutic *sox9* and TGF-β rAAV vectors coated on pNaSS-grafted microstructured PCL scaffolds enhances the chondrogenic differentiation activities in human bone marrow aspirates relative to control treatments. These Results show the potential of targeting human bone marrow aspirates via therapeutic rAAV-coated pNaSS-grafted microstructured PCL scaffolds as a convenient tool to treat articular cartilage defects.

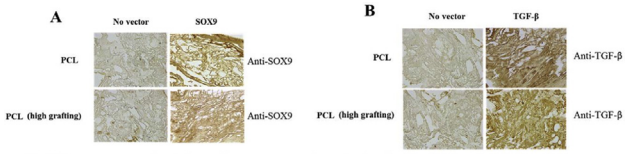

Fig.1. Transgene expression in human bone marrow aspirates incubated with pNaSS-grafted PCL scaffolds. SOX9 (A) and TGF-β (B) immunodetection (day 21).

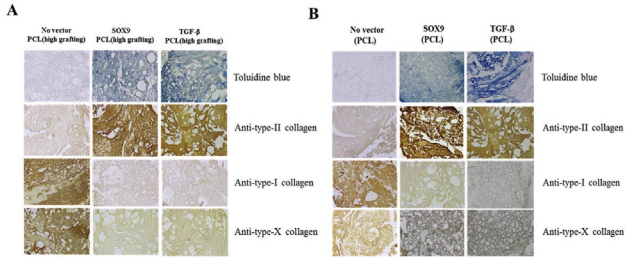

Fig.2. Detection of matrix components in human bone marrow aspirates incubated with pNaSS-grafted PCL scaffolds. Highly grafted (A) and non-grafted PCL scaffolds (B) (day 21).

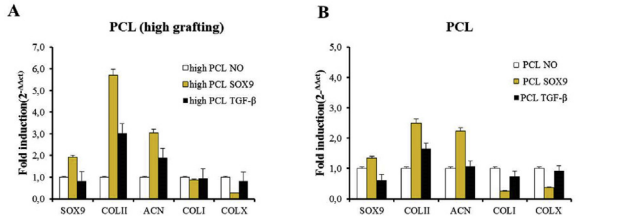

Fig.3. Real-time RT-PCR analyses in human bone marrow aspirates incubated with pNaSS-grafted PCL scaffolds. Highly grafted (A) and non-grafted PCL scaffolds (B) (day 21).

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INJECTION WITH AUTOLOGOUS CONDITIONED SERUM HAS BETTER CLINICAL RESULTS THAN PHYSICAL TERAPY FOR KNEE OSTEOARTHRITIS

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Purpose: Purpose: Knee osteoarthritis is a noninflammatory disease of the knee joint which causes damage to the articular cartilage and new bone on the joint surfaces and edges. The hypothesis of this study argues that autologous conditioned serum (i.e. ACS or Orthokine) injections in chronic knee osteoarthritis have a better outcome than physician therapy

Methods: A prospective clinical study included 90 patients, average age 69 years, who met ACR criteria for knee osteoarthritis, and they were on the rehabilitation treatment in Clinic for rehabilitation G. Trepca for three weeks, between 2014.-2018. year. They were divided into two groups, the first one had only physical therapy and the second one received ACS therapy in addition to physical therapy. Physician treatment consisted hydrotherapy in calcium-magnesium, hydrocarbon, oligomineral, hypothermia water (29ºC), kinesitherapy, electrotherapy, magnetic therapy and lasertherapy. All patients who received an autologous-conditioned serum-injection, first had 40 ml of whole blood taken using special syringe with increased inner surface area. After that blood incubated at 37 °C and after incubation, the blood-filled syringes were centrifuged, and the serum supernatant was filtered and aliquoted into five 2 ml portions. The aliquots were frozen at minus 20 °C. Serum injected directly into the area of maximum pain as identified by the patient. The Orthokine group received five ACS injections, twice weekly, over three weeks. Before injection or physician therapy and 6 weeks, 12 weeks and 24 weeks thereafter, the patients were assessed by means of the range of motion in the joint (flexion and extension) ,Number of stand up per 30 seconds, Stand up and go test, Womac index and VAS for pain (scale from 0 - 100mm).

Results: Of 90 patients, 45 in ACS- Orthokine group and 45 in physician therapy group, 72 (80%) were women and 18 (20%) men, mean age 69±12.14 years (20-91 years) (Tables 1 and 2), and the average duration of illness was 9±7.64. Both patient groups had statistically significant better flexion, and the number stand up per 30 sec. ($P < 0.001$) and values of VAS scale, Womac index and stand up and go test ($P < 0.05$) six weeks after compared to the baseline before ACS- Orthokine or physician therapy. At week 24, the ACS- Orthokine group exhibited signifcantly greater improvements, at all of the monitored parameters, compared with the physician therapy group (p=0.001).

Conclusions: Conclusion: The data analysis showed that the both patient groups, at week 6, with knee osteoarthritis, have beneficial effect on reducing pain, increasing mobility and functionality . However, on the second and third measurements, significantly improved parameters were observed in the ACS group, both in functional tests and in the assessment of pain by patients. It could be concluded that the combination of these two therapies, ACS and physical therapy, brings greater benefit for the patient with knee osteoarthrosis.

Table 1.
Flexion and extension before and after ACS- Orthokine 6w/12w/24w

ACS- Orthokine	Before treatment	After treatment
Flexion	84	92/95/96
Extension	14	12/10/11
Flexion and extension before and after physician therapy		
Physician therapy	Before treatment	After treatment 6w/ 12w/24w
Flexion	85	93/90/88
Extension	13	10/10/12
No. Stand up per 30 sec., STAND UP AND GO, WOMAC, VAS before and after treatment 6w/12w/24w		
ACS- Orthokine	Before treatment	After treatment 6w/ 12w/24w
No. Stand up per 30 sec.	3.4	4.5/4.6/4.7
STAND UP AND GO	17.3	14.2/14.2/14.1
WOMAC	2.97	2.31/2.29/2.27
VAS	71.5	45.7/43.6/39.5
No. Stand up per 30 sec. STAND UP AND GO WOMAC VAS before and after Physician therapy		
Physician therapy	Before treatment	After treatment 6w/ 12w/24w
No. Stand up per 30 sec.	3.3	4.2/4.2/3.9
STAND UP AND GO	17.4	14.5/15.7/16.1
WOMAC	3.01	2.45/2.85/2.80
VAS	70.1	48.4/60.6/65.6

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ADAMTS-TARGETING GAPMERS AS A GENE MODULATION STRATEGY IN OSTEOARTHRITIS

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Purpose: Osteoarthritis (OA) is marked by the disruption of cartilage homeostasis and enhanced extracellular matrix degradation. The ADAMTS enzyme family, in particular ADAMTS4 and ADAMTS5, have