

# ACP<sup>SVF</sup>

Regenerative Match



**Arthrex**<sup>®</sup>  
personalized  
cell therapy

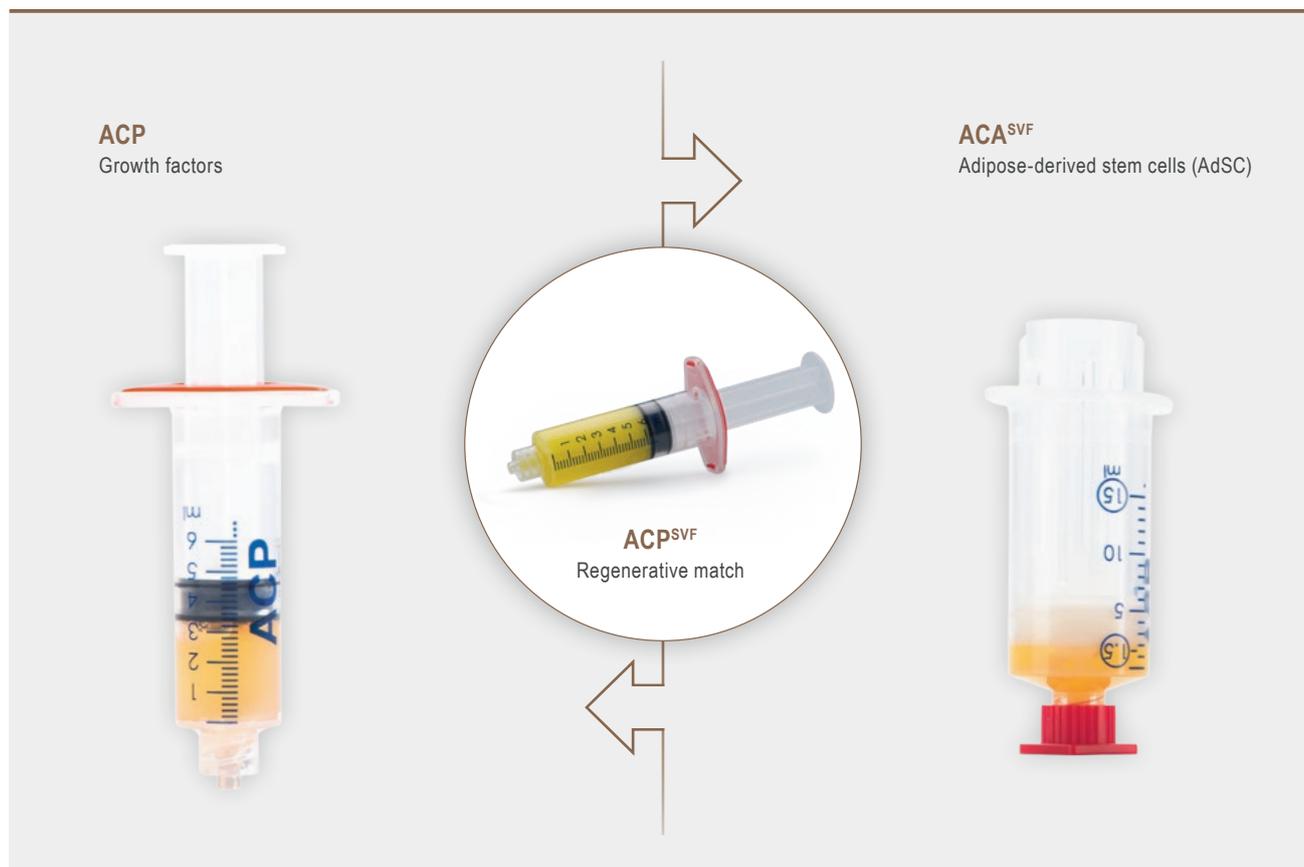
## Introduction

Biological treatment options have gained growing interest over recent decades. Blood products such as platelet-rich plasma (PRP) have been extensively studied for different indications. Another treatment option is autologous mesenchymal stem cells where several potential sources could be identified, including adipose tissue, bone marrow or umbilical cord.<sup>1,2</sup>

Stem cells from adipose tissue (AdSC), which are located in the stromal vascular fraction (SVF), share similar properties as bone-marrow-derived stem cells. They can differentiate into different cell lines such as fat, bone, cartilage and muscle<sup>3</sup> and secrete a large number of cytokines and growth factors<sup>4,5,6</sup> but in comparison to bone-marrow-derived stem cells, they are easier to collect for clinical application and show higher isolation yields.<sup>7</sup>

ACP<sup>SVF</sup> combines both the benefits of Autologous Conditioned Plasma (ACP) and the regenerative potential of autologous stromal vascular fraction (SVF). This combination has been suggested as having a promising approach for tissue regeneration.<sup>8,9</sup> The supplementation of cell culture media with Arthrex ACP resulted in dose-dependent cell growth and proliferation of AdSCs in vitro.<sup>13</sup> This synergistic effect of PRP and AdSC has been examined in several in vitro and pre-clinical studies for different tissues (skin, bone, cartilage) wherein it could be shown that PRP promotes cell proliferation and differentiation of adipose-derived stem cells.<sup>10-16</sup>

## Principle of ACP<sup>SVF</sup>



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# Arthrex ACP®

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## Arthrex ACP®

The unique Arthrex ACP double syringe system offers a time-saving solution for the sterile separation of non-homogenous liquids and, in particular, for the production of an Autologous Conditioned Plasma enriched in platelets and growth factors. Withdrawal of blood from the human body with the Arthrex ACP double syringe system is simple, only requiring a commercially available cannula with a Luer lock connection.

## Arthrex ACP® – Features and Benefits

- Two-in-one – Unique double syringe system for the preparation of Autologous Conditioned Plasma
- Time-saving – ACP preparation can be performed within minutes
- Closed system – Enables use in a clinic or under sterile conditions in an OR
- Safe and easy – The double syringe design allows for easy, convenient and safe handling of ACP

## Mechanism of ACP

The blood plasma obtained with the Arthrex ACP double syringe system contains a platelet concentration increased by about 2.5 times.<sup>17</sup> Platelets are known to release various proteins, including growth factors, when activated. These growth factors are required for healing in a variety of tissue types and they appear to work synergistically.<sup>18, 19, 20</sup>

## Major Effects of Growth Factors

- Induce proliferation and differentiation of various cell types<sup>21</sup>
- Enhance production of matrix (e.g. collagen, proteoglycan production)<sup>22</sup>
- Stimulate angiogenesis and chemotaxis<sup>23</sup>

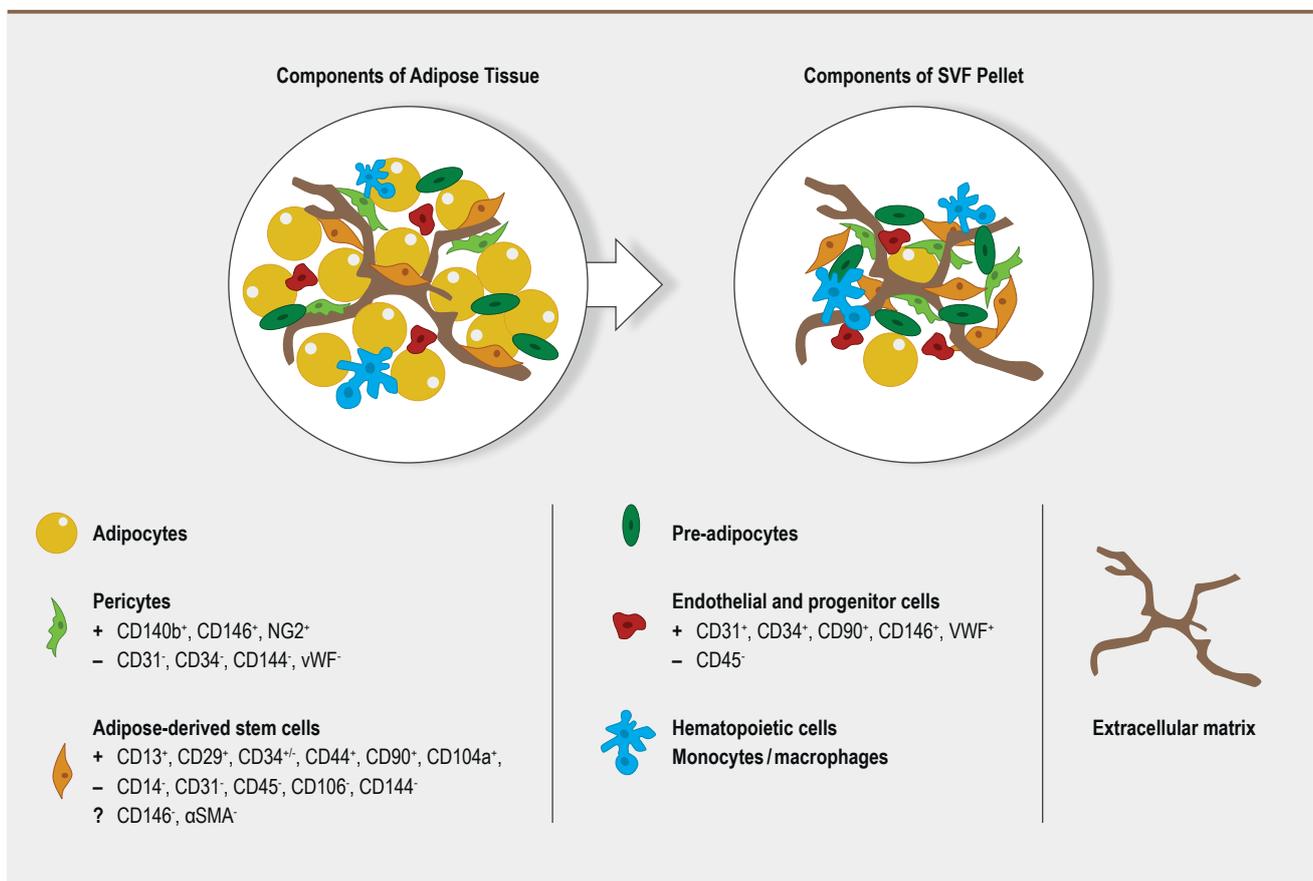


The ACA (Autologous Conditioned Adipose Tissue) technique offers an easy and fast solution for harvesting and processing of non-homogenous liquids such as adipose tissue to generate ACA<sup>SVF</sup>. The SVF is isolated by mechanical dissociation of the adipocytes whereby the regenerative cells within the SVF can be collected as a pellet.<sup>24</sup>

## Regenerative Potential of SVF

In addition to the AdSCs, the SVF comprises some endothelial cells, smooth muscle cells, erythrocytes, leukocytes, adipocytes and the extracellular matrix which can act as a temporary scaffold that also contains matrix remodeling enzymes.<sup>25,26</sup>

## Composition of SVF



(Modified picture<sup>27</sup>)

In addition to their multipotent differentiation potential, adipose-derived stem cells also secrete a large number of cytokines and growth factors such as hepatocyte growth factor (HGF), interleukin-6 (IL-6) or transforming growth factor-beta 1 (TGF-β1) that support tissue regeneration.<sup>4, 5, 6, 28</sup>

## Major Effects of SVF

- Reduction of local inflammation<sup>29-33</sup>
- Anti-apoptotic<sup>4, 5, 6, 28</sup>
- Prevention of tissue fibrosis<sup>33</sup>
- Supports angiogenesis and tissue remodeling<sup>4, 5, 6, 28</sup>

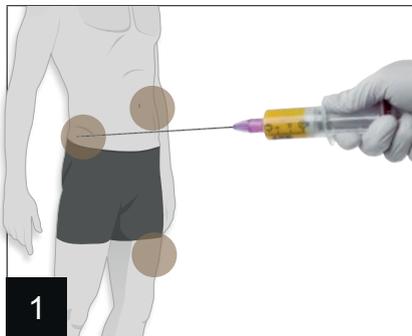
## AdSC/SVF/Microfat in Rejuvenation and Lipofilling

In several laboratory and preclinical studies using different animal models (goat, rabbit, mouse), it has been described that SVF may exert multiple functions on cells via the release of different types of molecules depending on the microenvironment. AdSCs inhibit fibrotic remodeling and apoptosis, enhance endogenous stem cell recruitment and proliferation, and reduce immune responses.<sup>28</sup>

Promising clinical results have been published for correction of superficial rhytides, scars, and dark lower eyelids.<sup>34</sup> SVF/microfat appears suitable for skin rejuvenation in areas which are usually challenging to treat, such as the perioral, periorbital or décolleté area.<sup>34</sup>

Moreover, the benefits of SVF cells concerning fat survival could be shown in clinical trials. For different indications, such as breast surgery or facial contouring, studies showed higher fat survival in the group treated by a combination of SVF + fat compared to fat alone.<sup>35,36</sup>

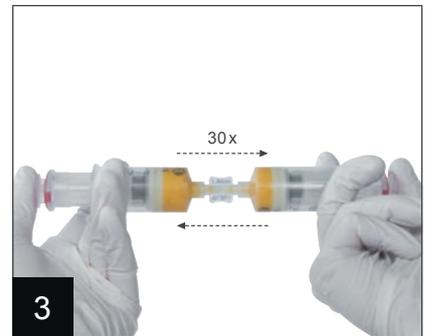
### Preparation of ACP<sup>SVF</sup>



Fat tissue harvesting from an appropriate donor site (e.g. belly, waist or thigh)



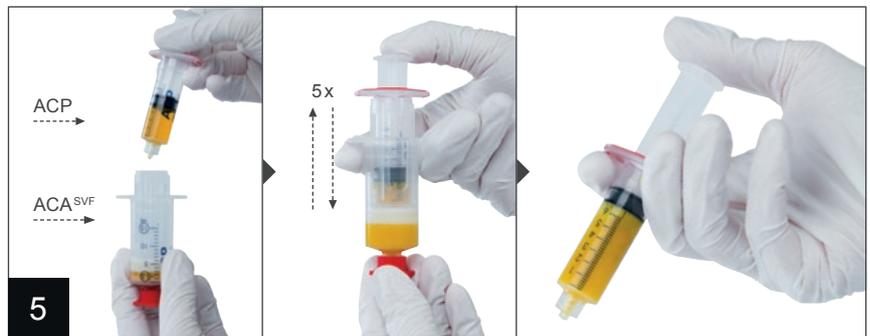
Isolation of fat graft  
(4 min. centrifugation at 2500 rpm)



Processing



Isolation of ACA<sup>SVF</sup>  
(4 min. centrifugation at 2500 rpm)

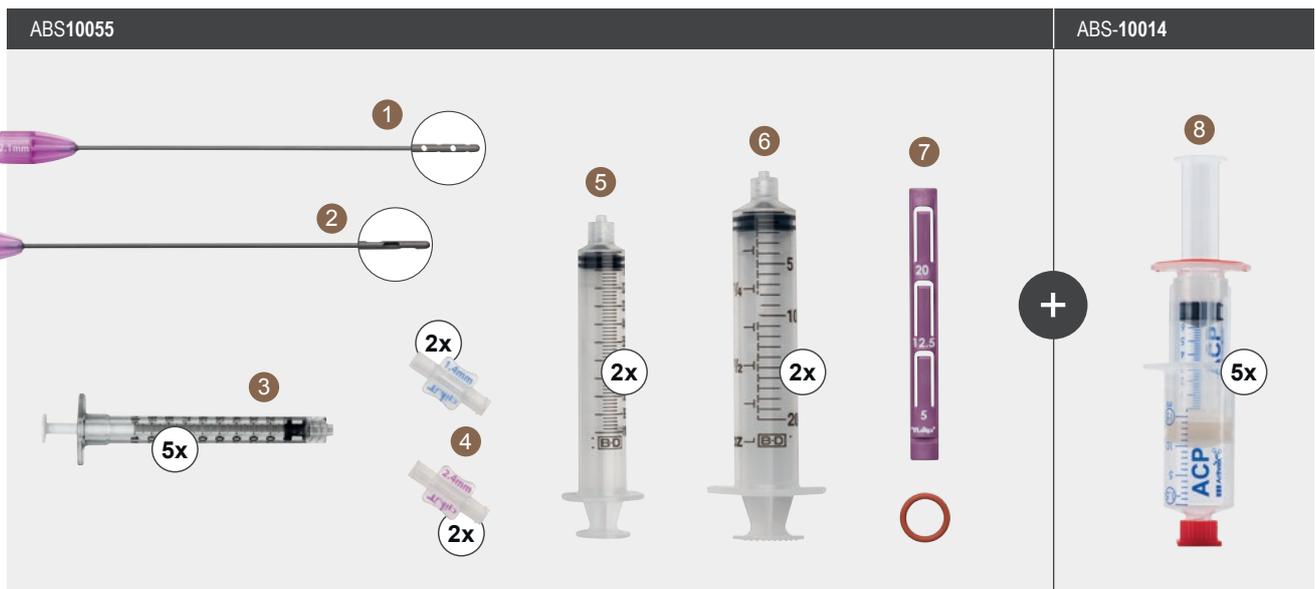


Combination with ACP: ► ACP<sup>SVF</sup>

## Ordering Information

Description	Item Number
Arthrex ACP® kit, series I	ABS-10011
Arthrex ACP® double syringe	ABS-10014
Centrifuge Hettich Rotofix 32 with swing out rotor, 220 V	1206-Art
Centrifuge Hettich Rotofix 32 with swing out rotor 1324, 110 V	1206-01-Art
Bucket with screw cap for centrifuge (spare)	ABS-10022
Screw cap for ABS-10022 (spare)	ABS-10023
Counterweight for centrifugation of ACP double syringe, 15 ml	ABS-10027
Viscous-Gel™ high viscosity ratio applicator with 10 cm mixing tip	ABS-10050
Viscous-Spray™ low viscosity ratio applicator with 3 cm mixing / spray tip	ABS-10051
Fenestrated delivery needle	ABS-20000
Tuohy delivery needle, 17 gauge	ABS-21000
Cart for centrifuge, 45 cm	KU.1079.800
Adipose tissue harvesting kit	ABS10055

An anticoagulant can be purchased on request.



- 1 Carraway harvester
- 2 Infiltration cannula
- 3 1 cc syringe
- 4 Transfer device

- 5 10 cc syringe
- 6 20 cc syringe
- 7 Johnnie Snap/O-ring
- 8 Arthrex ACP double syringe

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This description of technique is provided as an educational tool and clinical aid to assist properly licensed medical professionals in the usage of specific Arthrex products. As part of this professional usage, the medical professional must use their professional judgment in making any final determinations in product usage and technique. In doing so, the medical professional should rely on their own training and experience and should conduct a thorough review of pertinent medical literature and the product's Directions For Use.

