



Christian
Doppler
Laboratory

for
Cardiac and Thoracic
Diagnosis & Regeneration



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Differential effect of ischaemic preconditioning on mobilisation and recruitment of haematopoietic and mesenchymal stem cells in porcine myocardial ischaemia-reperfusion

[Gyöngyösi M](#), [Posa A](#), [Pavo N](#), [Hemetsberger R](#), [Kvakan H](#), [Steiner-Böcker S](#), [Petráši Z](#), [Manczur F](#), [Pavo IJ](#), [Edes IF](#), [Wojta J](#), [Glogar D](#), [Huber K](#).

2010 Aug 2.

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Experimental procedure

33 pigs

group IP (ischaemic preconditioning):

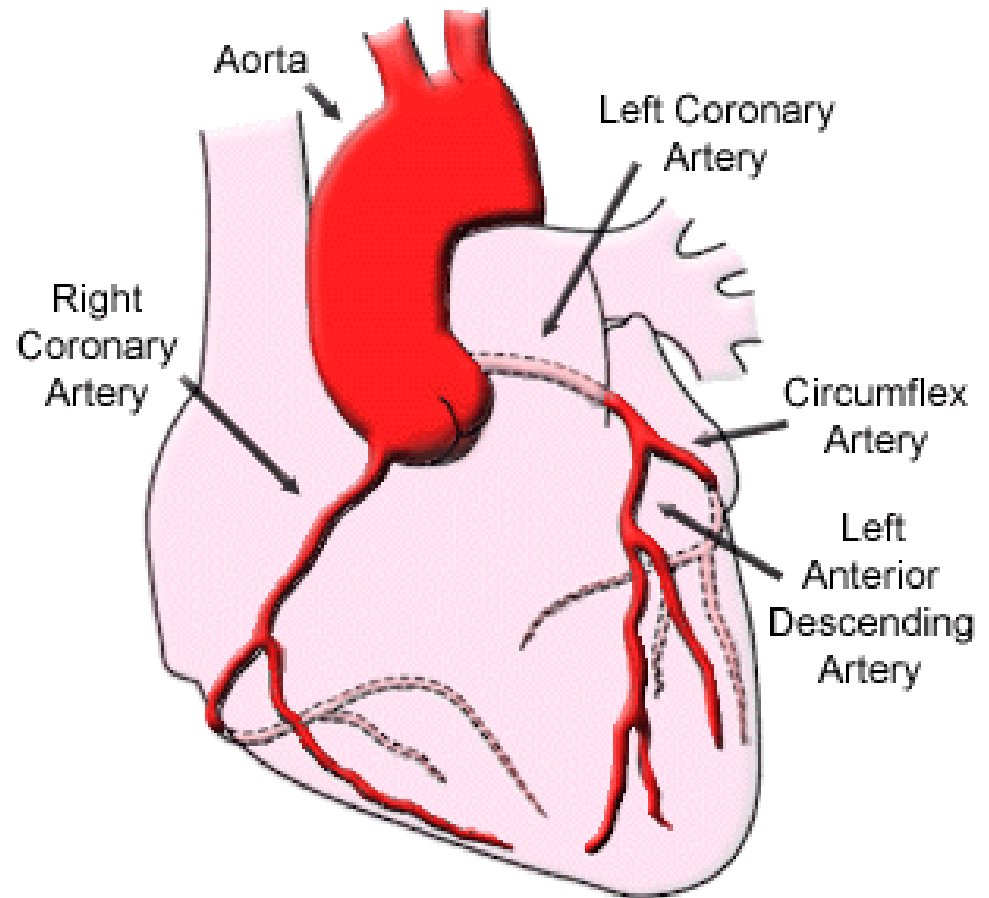
- 16 pigs
- 2*5-min periods of coronary occlusion of the mid-LAD
- 2*5-min periods of reperfusion before the following 90 min coronary occlusion

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group C (control):

- 17 pigs
- 90 min coronary occlusion of the mid LAD



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Methods

Bestimmung der Infarktgröße:

1. Evans blue Injektion
2. 5-6 Herzschnitte
3. Inkubation in 1%

Triphenyltetrazoliumchlorid Lösung

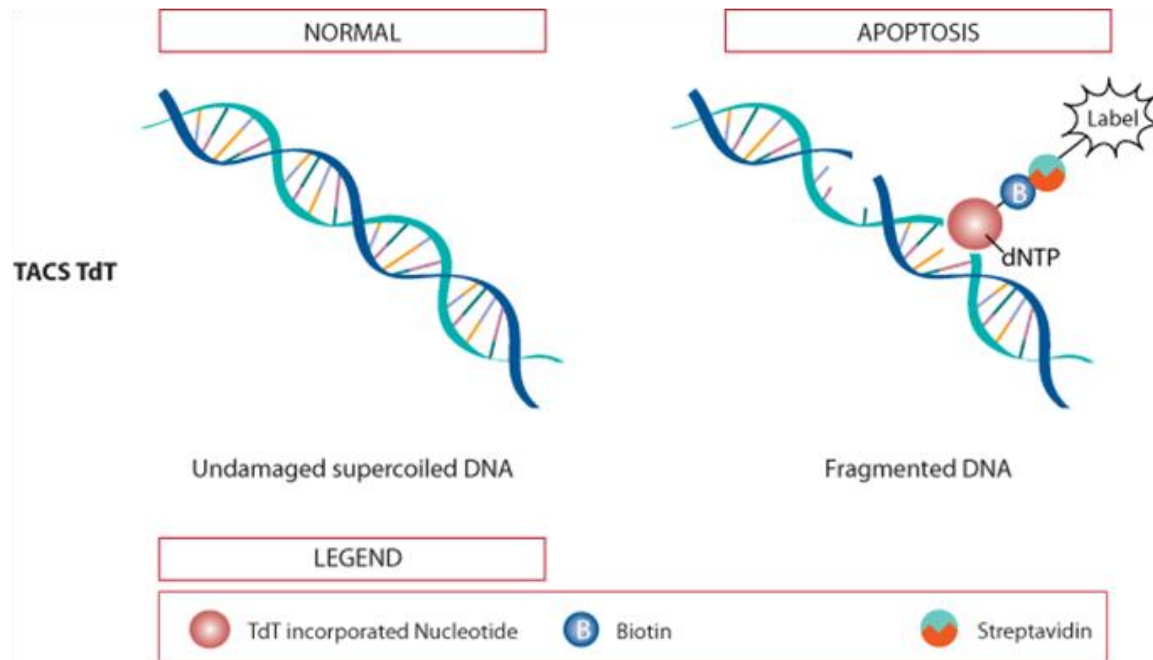
4. Formalin-Fixierung





Methods

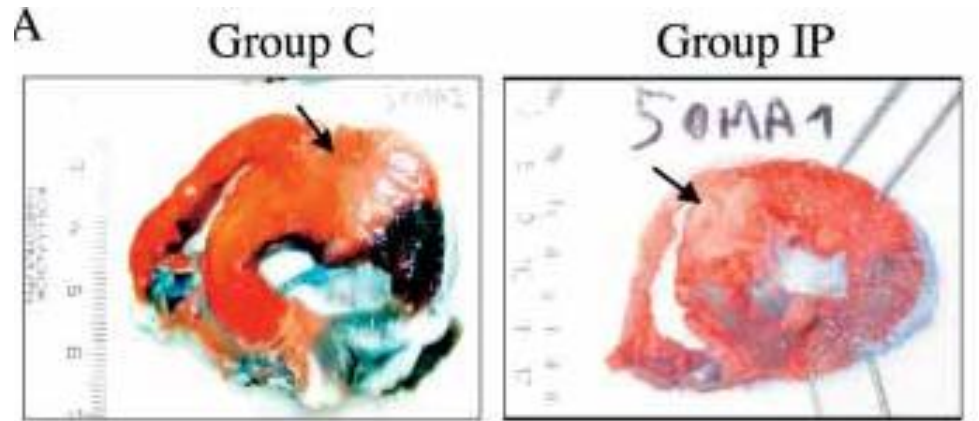
Apoptoseindex-Bestimmung in „border-zones“:



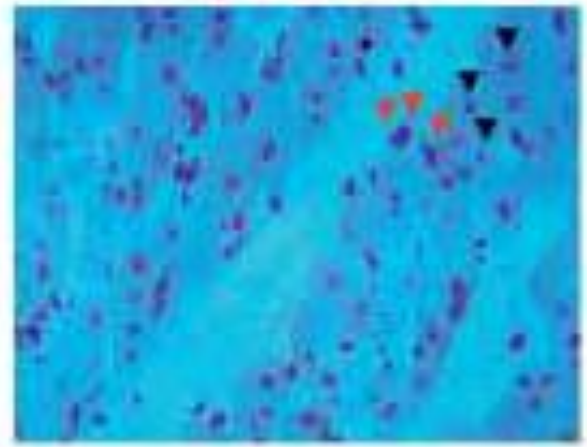


Methods

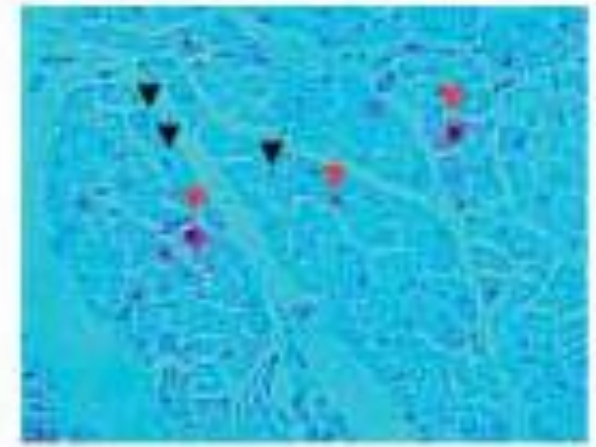
- Zytokinkonzentrationen i. S. von
 - VEGF
 - TNF- α
 - IL-8
 - SDF-1 α (=CXCL12)
- Anzahl von MSC und HSC i. S. und Myokard



Group C



Group IP



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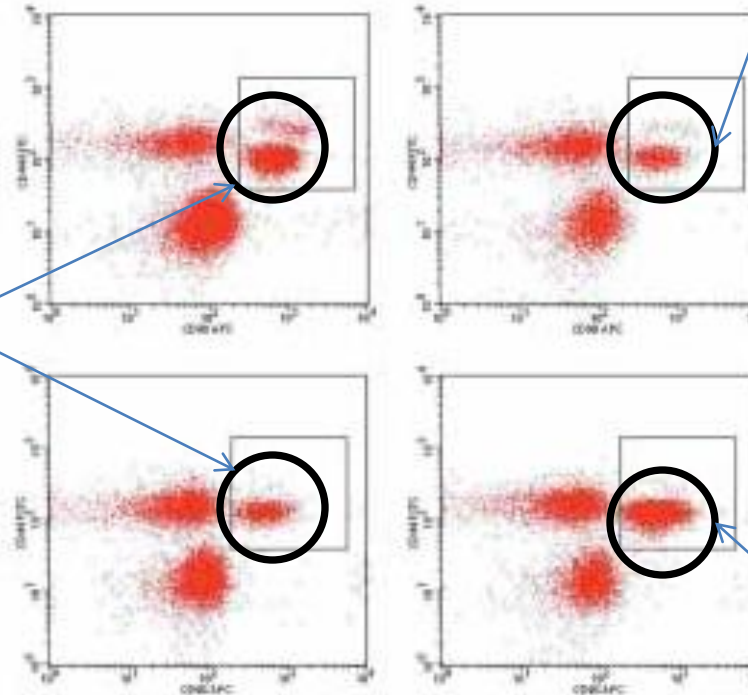
Circulating MSCs

A

Group IP

CD44+ / CD90+
(mesenchymale Stammzellen)

Group C



Baseline

Post 90 min occlusion +
120 min reperfusion

Abnahme

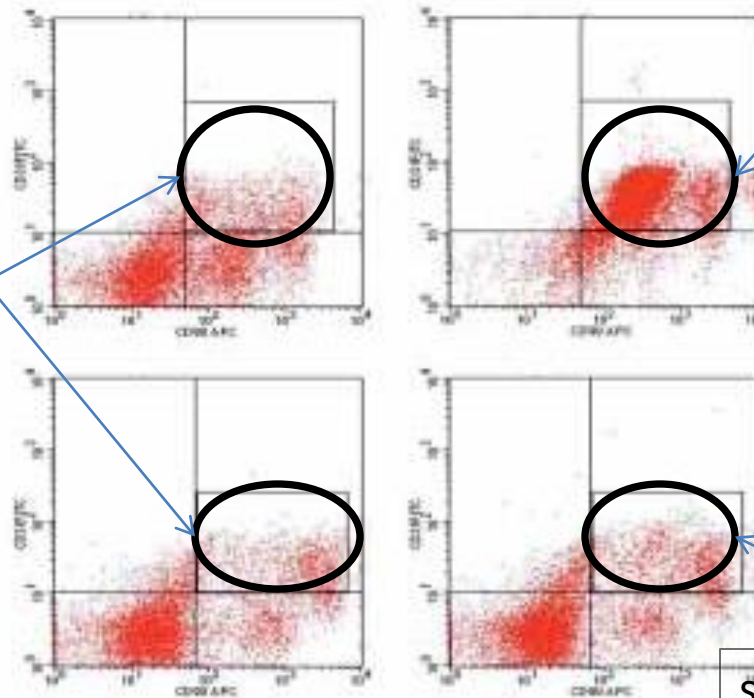
Stabil

Circulating HSCs

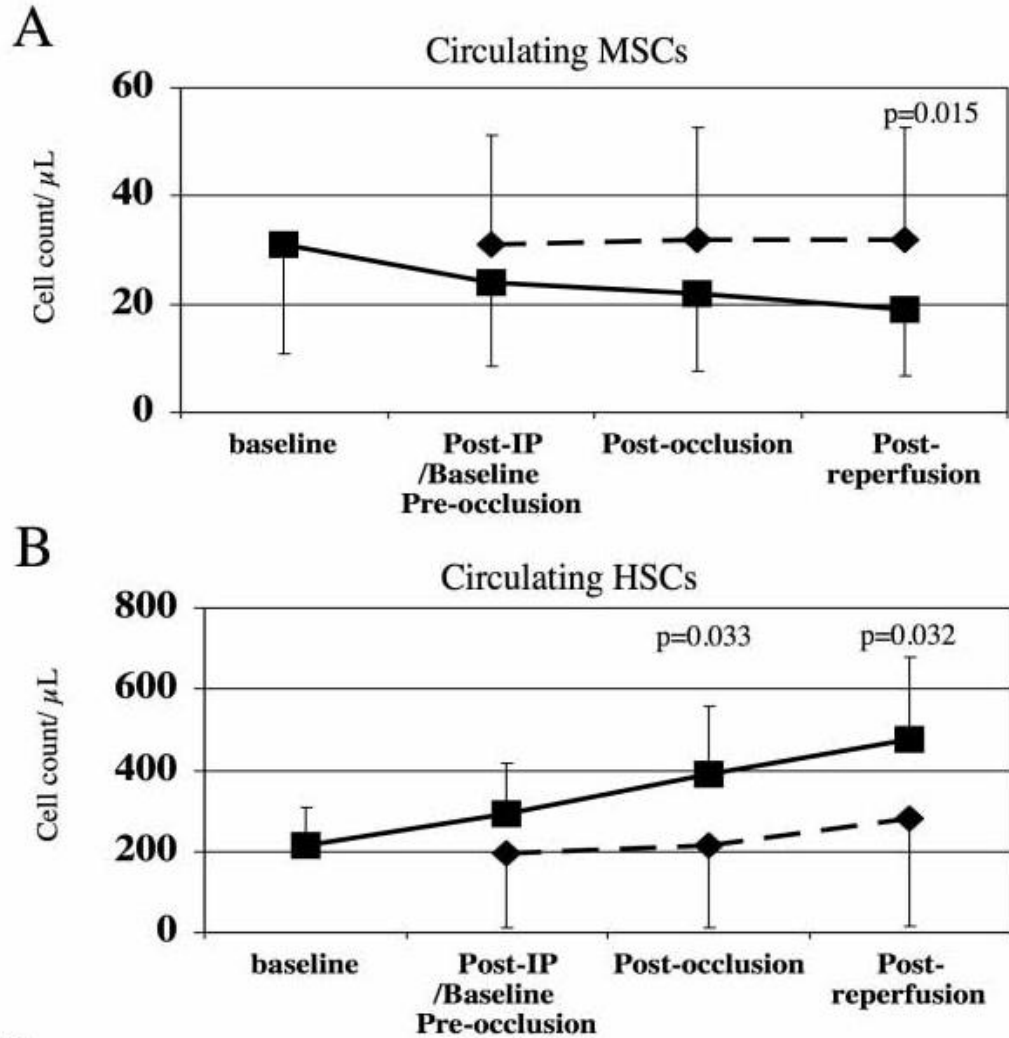
Group IP

CD31+ / CD90+ (hämat. Stammzellen)

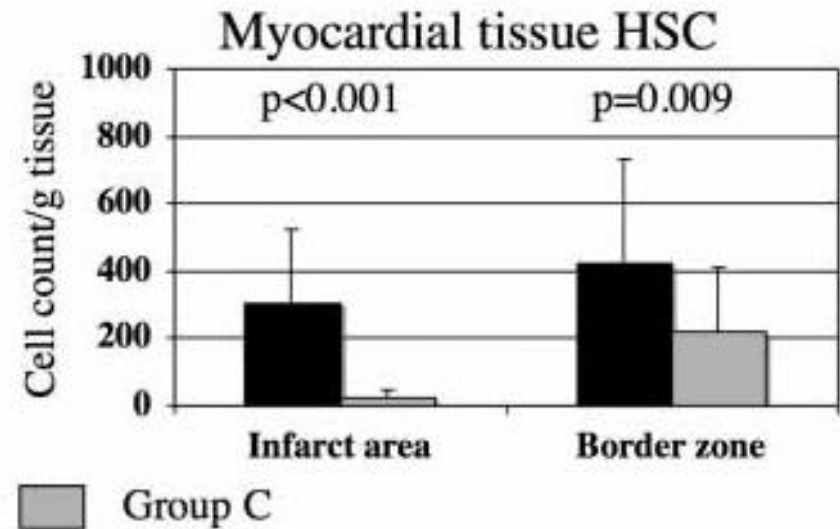
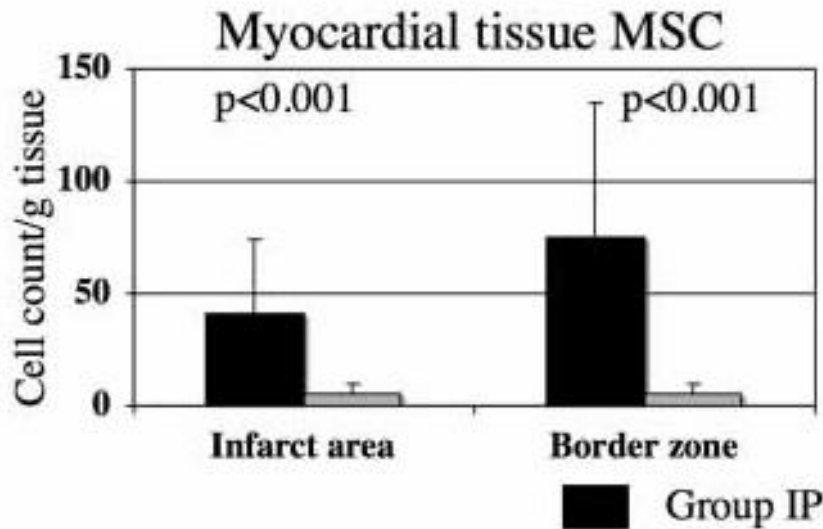
Group C



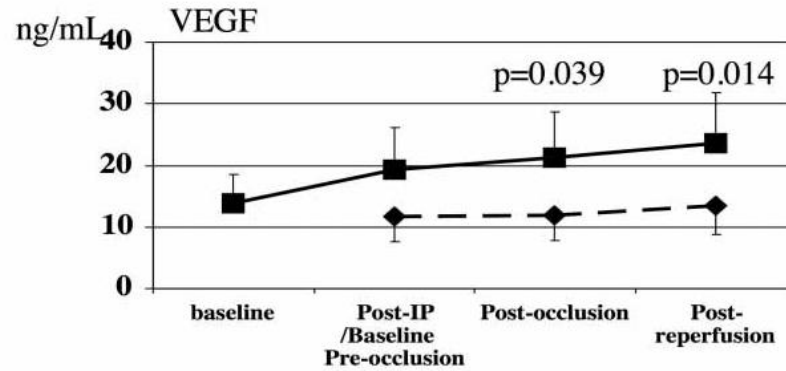
Baseline Post 90 min occlusion+
120 min reperfusion



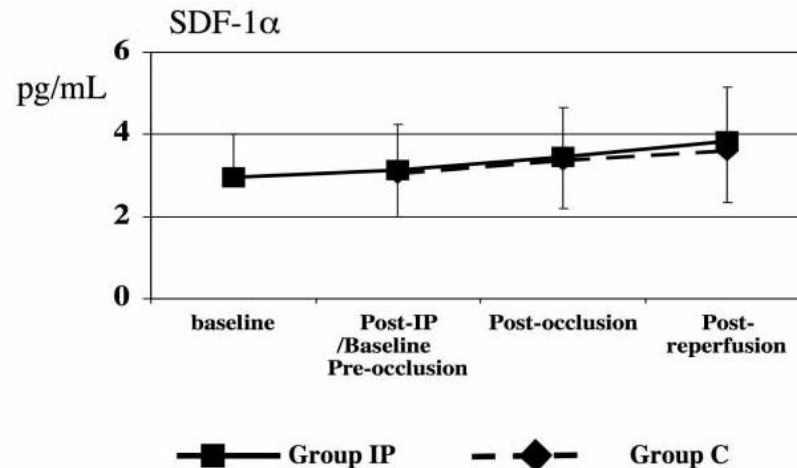
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A

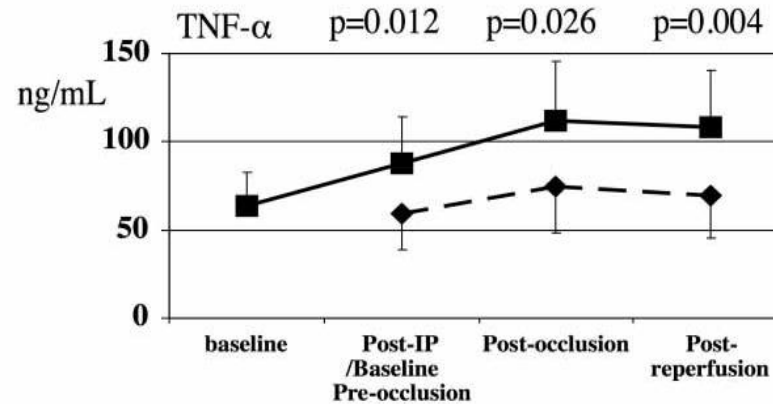


B

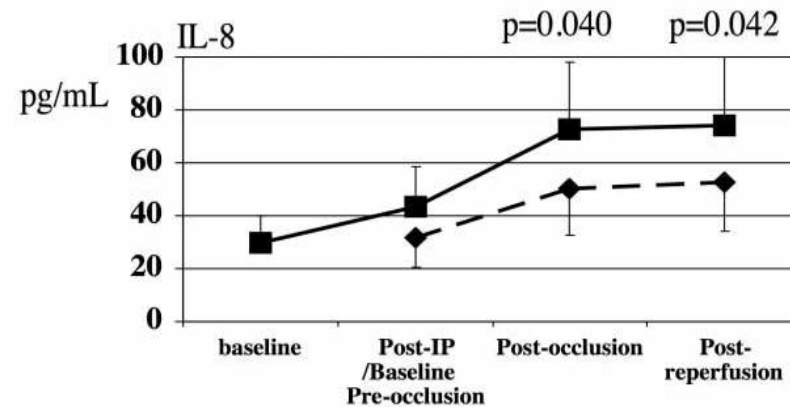


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A



B



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	Regression coef- ficient between infarct size (%) and	P-value
Circulating MSC (cell count/ μ l)	$r=-0.179$	0.320
Circulating HSC (cell count/ μ l)	$r=-0.345$	0.059
Infarct area MSC (cell count/g tissue)	$r=-626$	0.001
Border zone MSC (cell count/g tissue)	$r=-0.580$	0.013
Infarct area HSC (cell count/g tissue)	$r=-0.534$	0.004
Border zone HSC (cell count/g tissue)	$r=-0.601$	0.001

Korrelation zwischen der **Anzahl MSC** und **HSC** im
Infarktgewebe und der **Infarktgröße**



Unterschied zwischen Mobilisation und Rekrutierung

		serum	infarkt -area	border-zone
Group – IP	HSC	↑↑	↑	↑↑
Group – C	HSC	↑		
Group – IP	MSC	↓↓	↑	↑↑
Group – C	MSC	↔		



Discussion

Mobilisation von MSCs / HSCs von
verschiedensten Faktoren abhängig



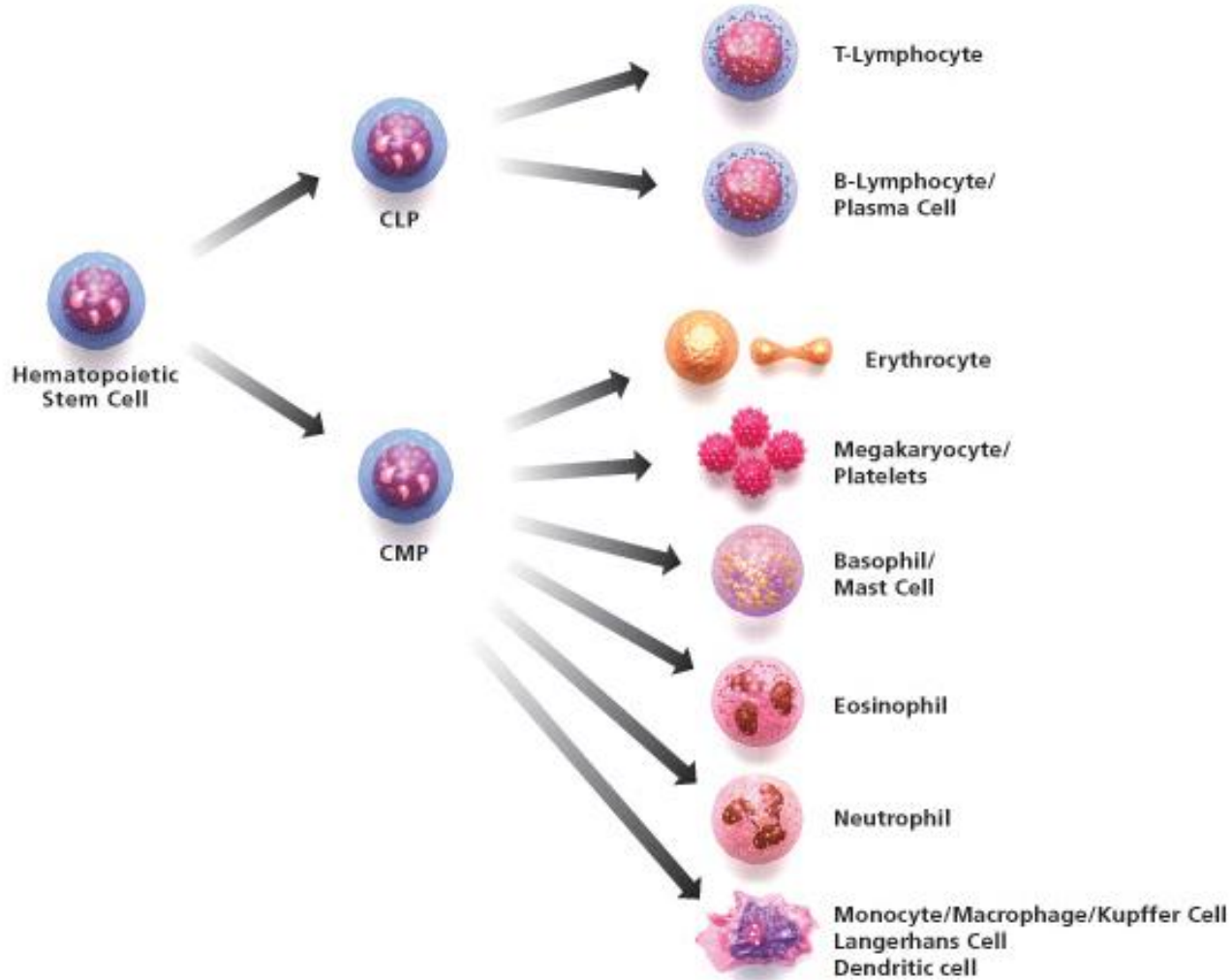
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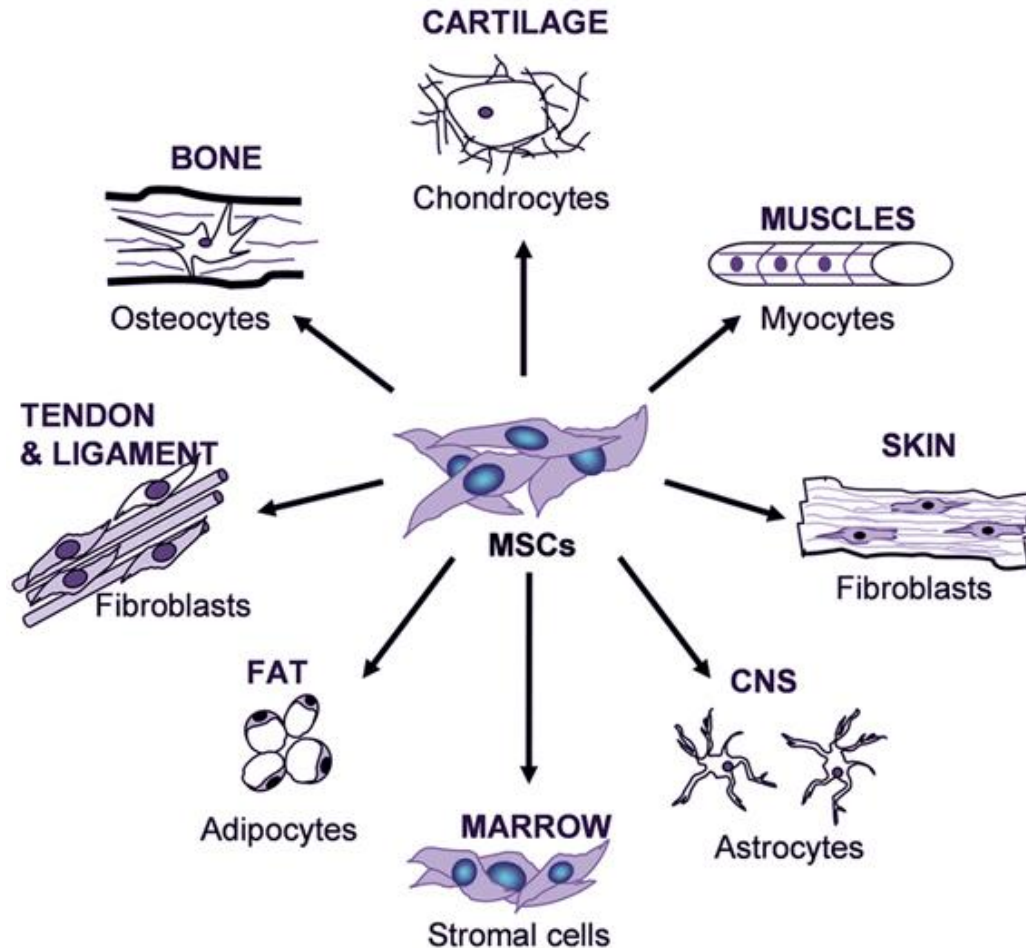


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