

## Symposium 7

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### Stem Cell Research

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# **Application of Endothelial Progenitor Cells (EPC) to Vascular Medicine: Mobilized EPC by GM-CSF accelerate reendothelialization and reduce vascular inflammation after intravascular radiation therapy**

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**Background-** Endothelial progenitor cells (EPC) play a pivotal role in repair and regeneration of damaged vessels. We investigated the role of mobilized EPC in the healing process following intravascular radiation therapy.

**Methods and Results-** One iliac artery of hypercholesterolemic rabbits was subjected to balloon injury and intravascular radiation with a Re-188 balloon, and the contralateral iliac artery to balloon injury only. Rabbits received rhGM-CSF (60  $\mu$ g/day, subcutaneously) daily for one week, either 7 days before the angioplasty or at the time of angioplasty. Control rabbits received human albumin. GM-CSF significantly increased the double positive (CD31+ and KDR+) fraction in peripheral blood monocytes and showed a higher number of EPC than albumin after culture, furthermore, enhanced migration and incorporation of EPCs. In the albumin group, intravascular radiation therapy reduced neointimal hyperplasia but delayed reendothelialization and aggravated monocyte infiltration. GM-CSF treatment significantly accelerated the reendothelialization and inhibited monocyte infiltration. [reendothelialization index =  $81 \pm 13\%$  in the GM-CSF radiation (n=7) vs  $30 \pm 11\%$  in the control radiation (n=9) at 2 weeks,  $p < 0.01$ ] GM-CSF treatment produced an additional significant reduction in neointimal formation at 14 and 28 days post-injury in the intravascular radiation groups. [I/M ratio:  $0.14 \pm$