

THE PROTECTIVE EFFECT OF ERYTHROPOIETIN ON HIGH GLUCOSE STIMULATED ENDOTHELIAL CELL

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Kidney diseases cause systemic organ injury

The regulators of systemic organ damage

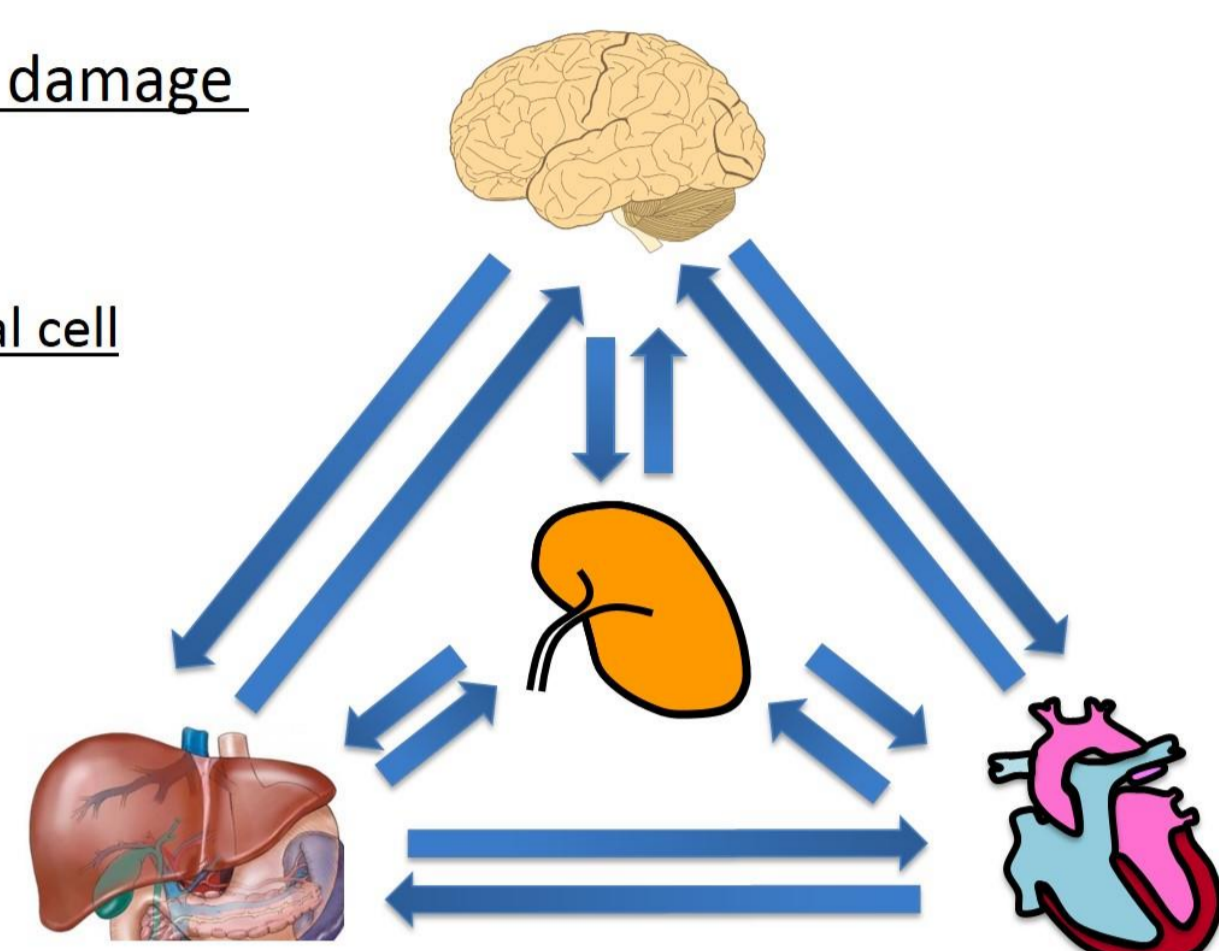
Cells

- Organ-resident cells - endothelial cell
- Peripheral blood cells

Humoral factors

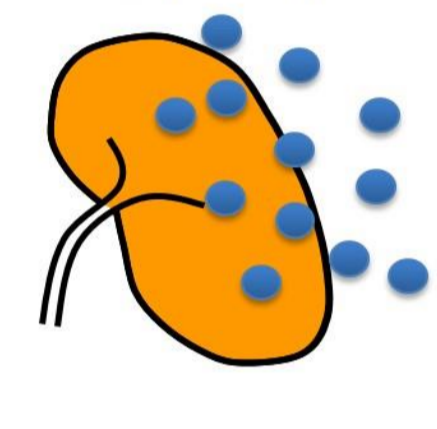
Erythropoietin

Neuron



Potential role of erythropoietin in organ protection

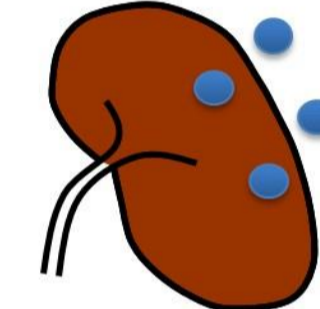
Healthy kidney



• Hematopoiesis

- Organ protection
- Prevent apoptosis of endothelial cells
- Increasing endothelial production of NO

Injured kidney



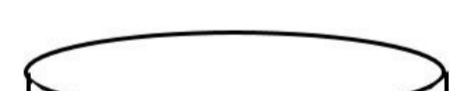
Teng R et al. Basic Res Cardiol. 2011

Hypothesis

Erythropoietin prevents endothelial cells from high glucose induced injury

Material and Method

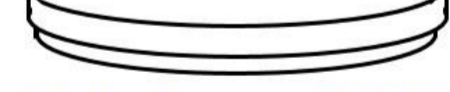
Human Umbilical Vein Endothelial Cell (HUVEC)



Normal glucose (5mM) 24hr

Isolate mRNA

Transcriptome with next generation sequencer

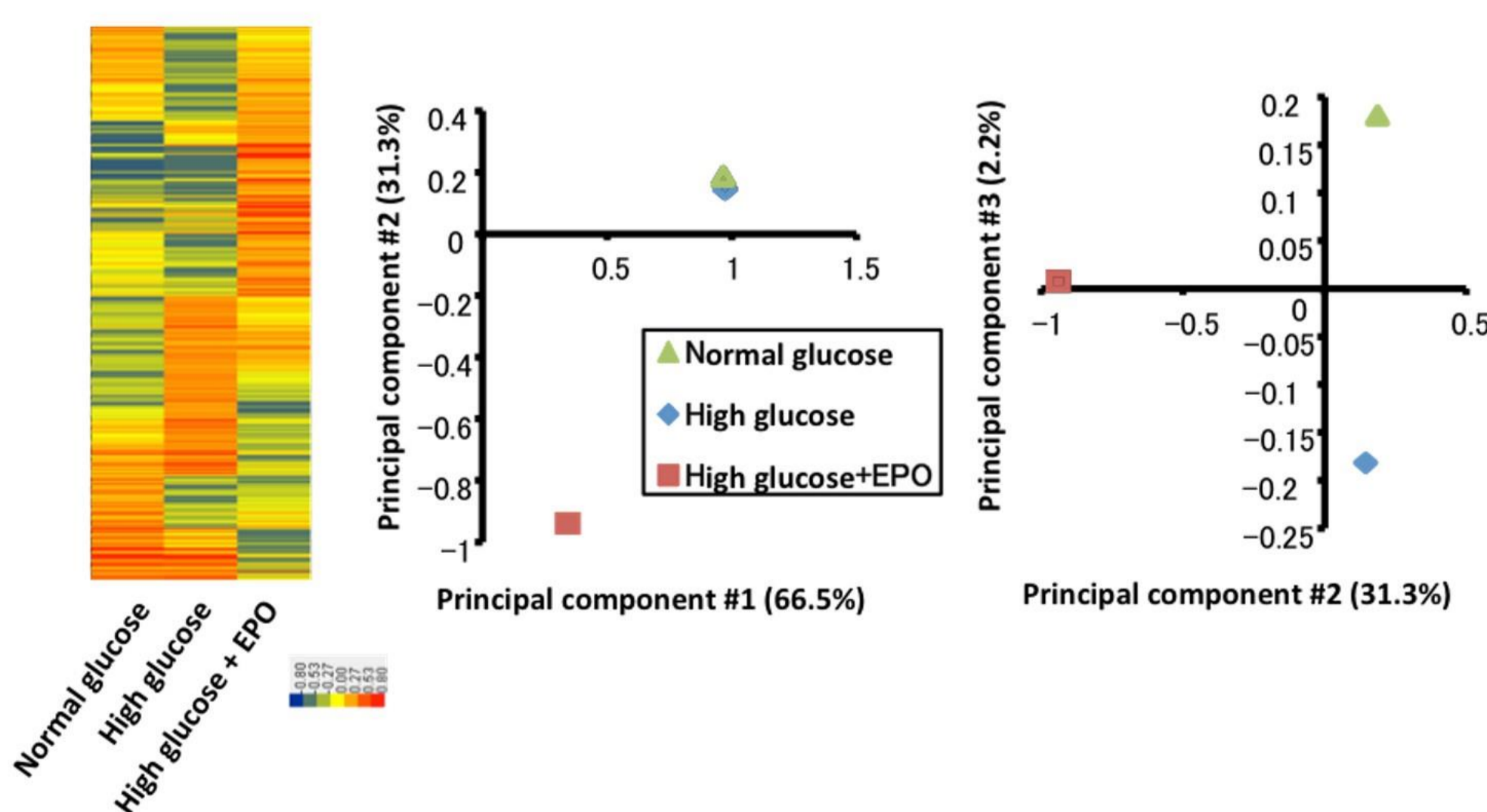


High glucose (HG) (30mM) 24hr

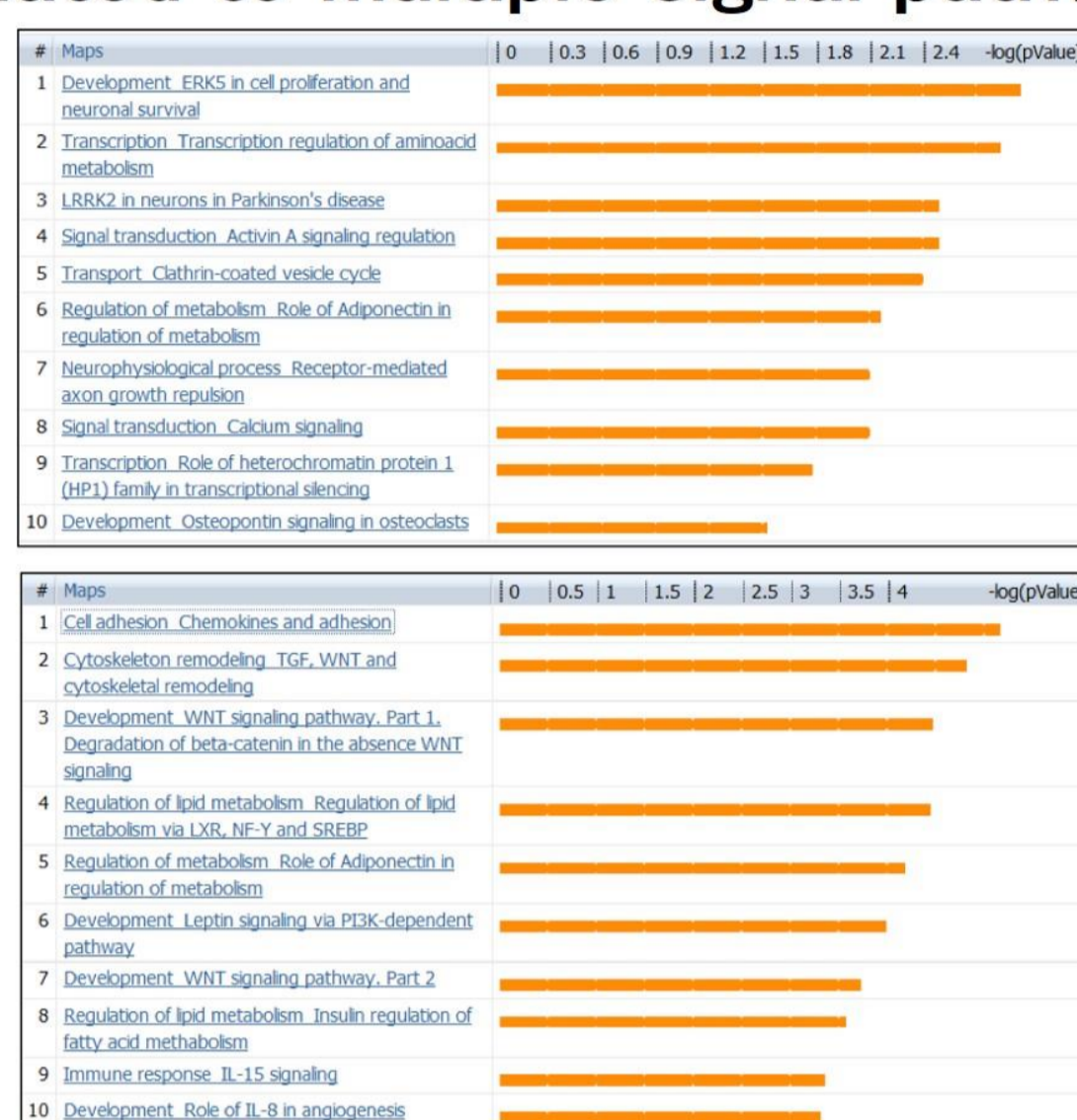


HG (30mM) + Erythropoietin (EPO) (5ng/ml) 24hr

EPO changed the mRNA expression on HG stimulated HUVEC



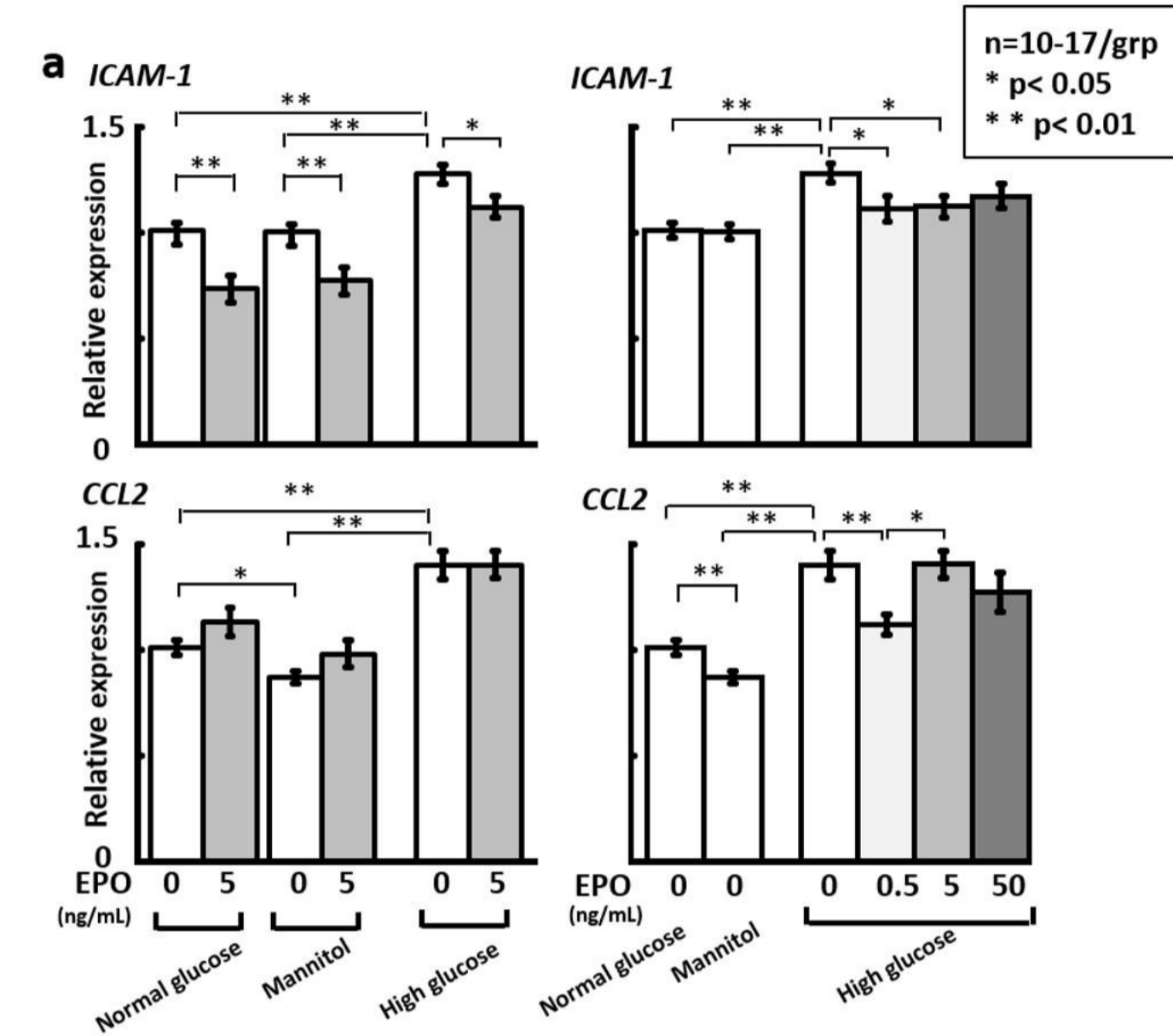
HG regulated the gene expression, those are related to multiple signal pathways



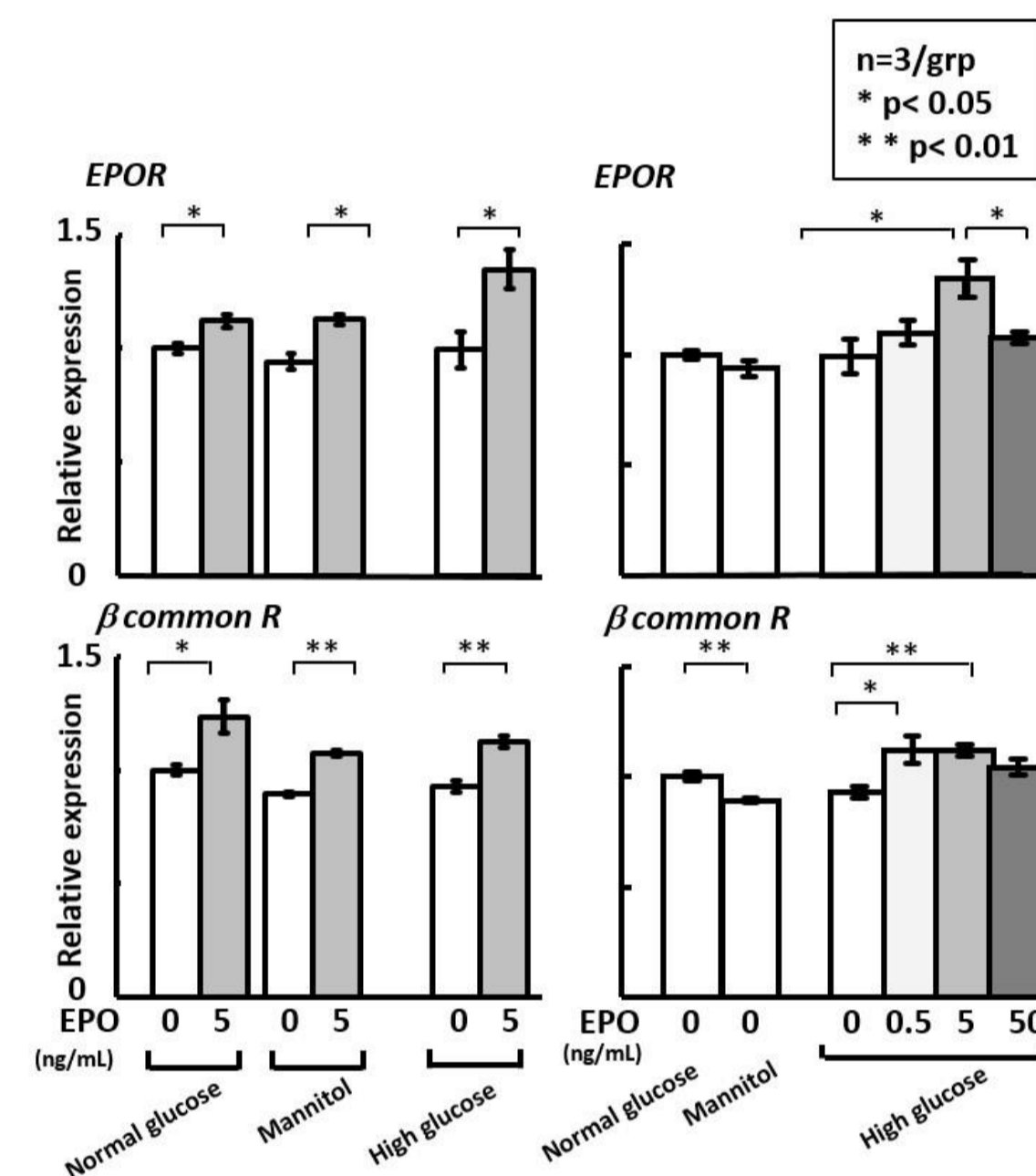
EPO regulated the gene expression, those are related to multiple signal pathways



EPO decreased the mRNA expression of inflammatory related genes in HG stimulated HUVEC



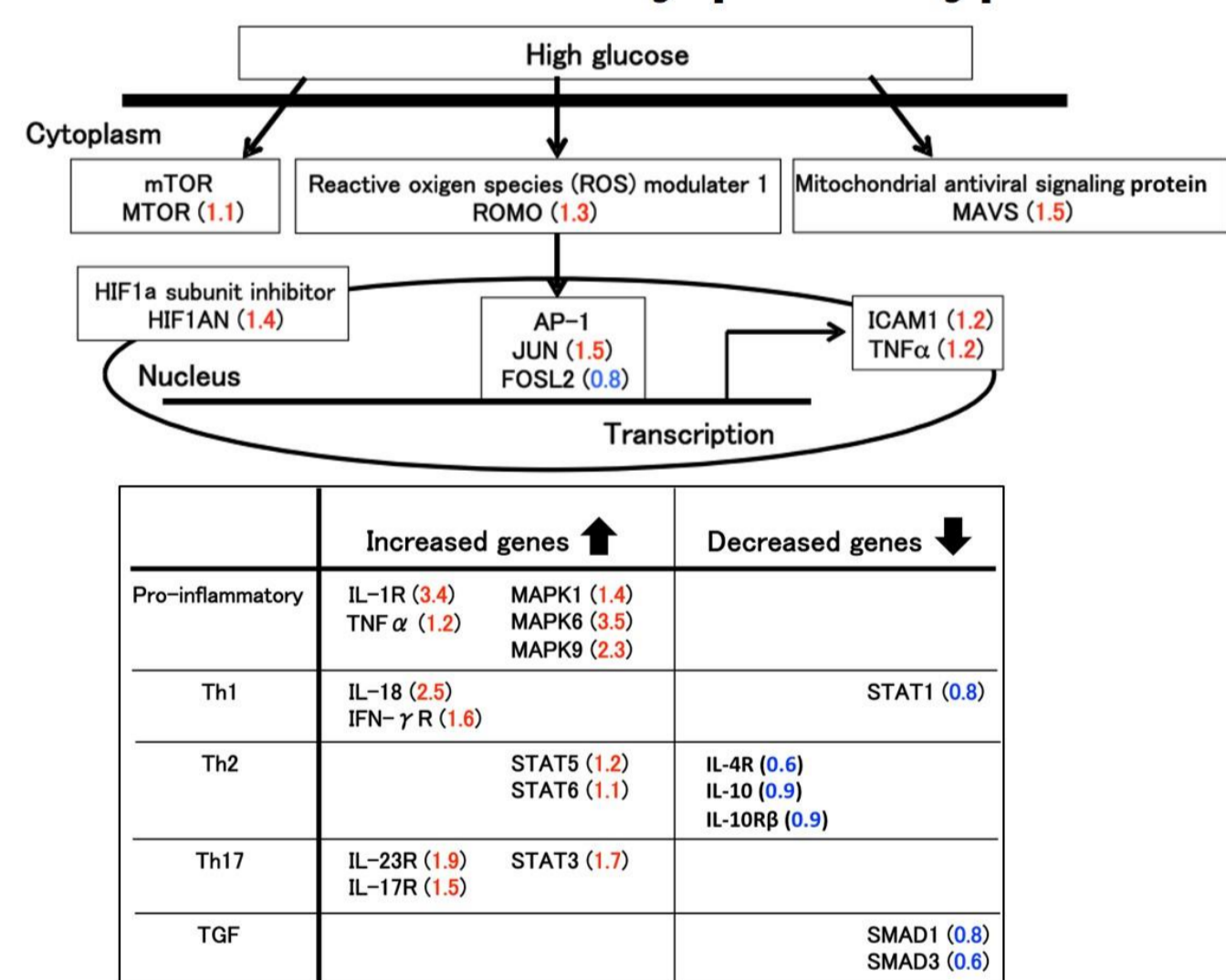
EPO increased the mRNA expression of EPO receptors in HUVEC



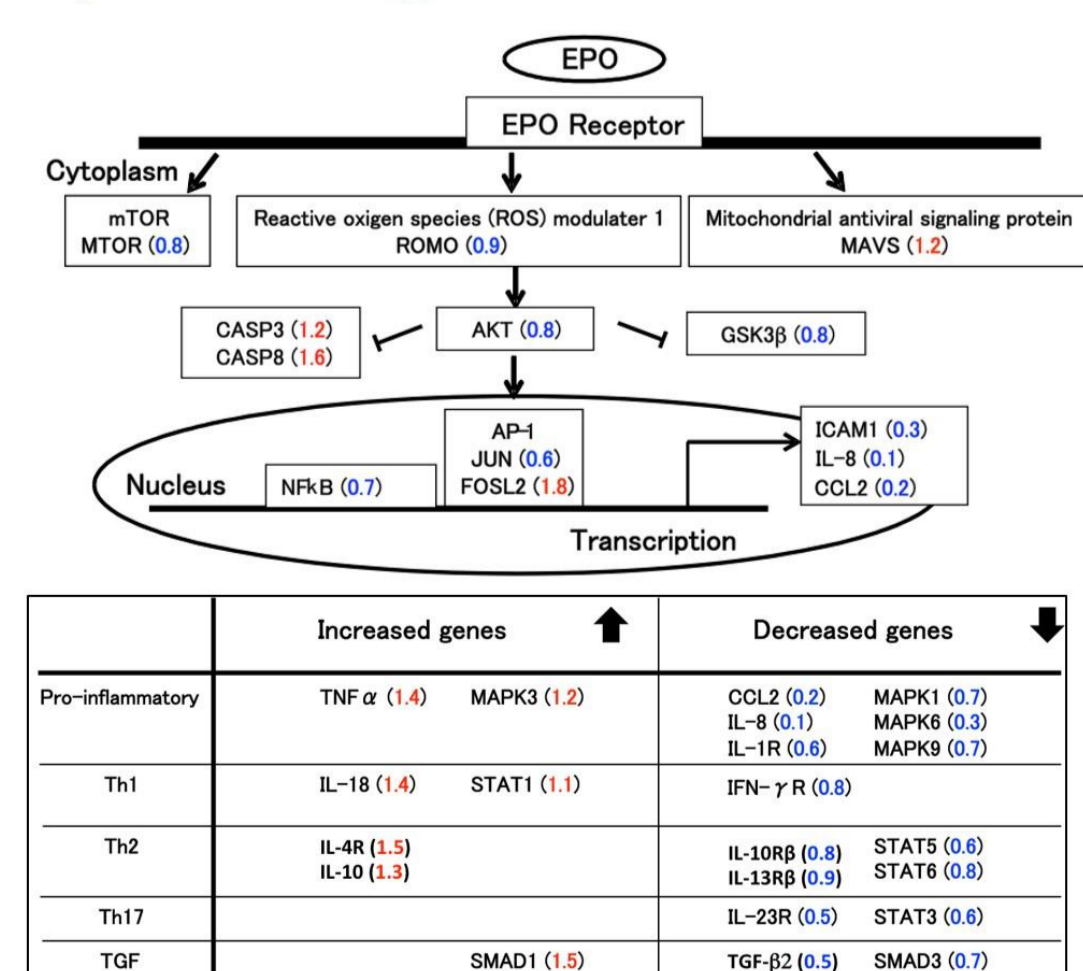
Summary

- EPO changed the mRNA expression on HG stimulated HUVEC
- HG regulated the gene expression, those are related to multiple signal pathways
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- HG stimulated HUVEC were skewed toward an inflammatory phenotype
- EPO increased the mRNA expression of EPO receptors in HUVEC

HG stimulated HUVEC were skewed toward an inflammatory phenotype



EPO decreased the mRNA expression of inflammatory related genes in HG stimulated HUVEC



EPO regulated immune balance on HG stimulated HUVEC

