

 HYPERTENSION

Role of $\gamma\delta$ T cells in the development of hypertension

New data suggest that $\gamma\delta$ T cells contribute to the development of hypertension and vascular damage. These unconventional innate-like T cells have a role in the initiation of immune responses.

“We previously demonstrated roles of macrophages, monocytes, and regulatory T cells in blood pressure elevation and vascular injury,” explains researcher Ernesto Schiffrin. “I thought that $\gamma\delta$ T cells, which bridge innate and adaptive immunity, might also be involved, so we decided to study them in a rodent model of hypertension: the angiotensin II [Ang II]-infused mouse.”

The researchers found that 7 days of Ang II infusion led to increases in the numbers and activation of $\gamma\delta$ T cells in the spleens of wild-type mice, whereas 14 days of Ang II infusion resulted in increases in systolic

blood pressure (SBP) and to endothelial dysfunction of the mesenteric arteries. These effects were abrogated in *Tcr δ ^{-/-}* mice, which lack $\gamma\delta$ T cells, and were blunted in mice with antibody-mediated $\gamma\delta$ T-cell depletion. Consistent with a role of $\gamma\delta$ T cells in the activation of other T cell subsets, *Tcr δ ^{-/-}* mice also showed a reduction in Ang II-induced T-cell activation in the spleen and perivascular tissue compared with wild-type controls.

To evaluate whether $\gamma\delta$ T cells might also have a role in human hypertension, Schiffrin and colleagues analysed clinical and whole blood gene expression data for 206 patients with and without coronary artery disease. Their multiple linear regression model, which integrated T cell receptor γ constant region gene expression levels, age and sex, showed a significant association between $\gamma\delta$ T cells and SBP.



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“The demonstration that $\gamma\delta$ T cells might have a role in Ang II-induced hypertension and in human blood pressure elevation may help to design novel treatments to limit the progression of hypertension and vascular damage,” says Schiffrin.

Ellen F. Carney

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