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**Title:** Recruitment and phenotypic characteristics of interleukin 9–Producing CD4<sup>+</sup> T cells in malignant pleural effusion

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**Body:** Background and objective: Our previous data have demonstrated that numbers of IL-9–producing CD4<sup>+</sup> T cells (Th9 cells) in malignant pleural effusion (MPE) were significantly increased when compared with blood. The aim of the present study was to investigate the mechanism by which Th9 cells were recruited into MPE and the phenotypic characteristics of pleural Th9 cells. Methods: The expression patterns of chemokine receptors (CCRs) on Th9 cells and the chemoattractant activity of chemokine CCL20 for Th9 cells in vitro were observed. The phenotypic features of Th9 cells in MPE were determined by flow cytometry. Results: We found that Th9 cells in both MPE and blood expressed high level of CCR6 on their surface. An in vitro migration assay confirmed that both MPE and supernatants of cultured pleural mesothelial cells could induced the migration of Th9 cells, and anti–CCL20 mAb significantly inhibited the ability of MPE or supernatants to stimulate Th9 cell chemotaxis. We also noted that pleural Th9 cells expressed high levels of CD45RO and very low levels of CD45RA and CD62L, displaying the phenotype of effector memory cells. Conclusions: Our data revealed that recruitment of Th9 cells into MPE could be induced by pleural CCL20, and that majority of Th9 cells in MPE displayed the phenotype of effector memory cells.