LYMPHOCYTE CHEMOTAXIS UNDER AGAROSE. Arthur O. Anderson and Jonathan T. Warren*. USAMRIID, Frederick, Md. 21701

In vivo studies (Amer. J. Path. 80:387, 1975 and Immunol. 31:731, 1976) suggested that blood born lymphocytes might be attracted into lymph nodes by chemical gradients diffusing from between venular endothelial cells. This hypothesis was tested in vitro using an agarose chemotaxis system developed by Nelson et al. (J. Immunol. 115:1650, 1975). Directed (D) and random (R) migration after 18 hr incubation was measured for each agent tested and a ratio (D/R) greater than 2 indicated significant chemotaxis or chemikinesis. Stem-leaf plots of the angles of directional orientation (0-360°) for individual migrating lymphocytes helped to discriminate chemikinesis from chemotaxis. Clustering of cell polarities about 180° indicated chemotaxis while chemikinesis resulted in random orientations. Thoracic duct lymphocytes exhibited positive chemotaxis toward infected rat plasma (D/R 4.3), activated C_3 (D/R 5.6), dialysable leukocyte extracts (DLE) (D/R 5.0), and Muramyl Dipeptide (MDP) (D/R 3.7). In contrast, lymphocytes failed to show chemotaxis toward normal rat plasma (D/R 1.0), activated C_5 (D/R 1.1) and F-met-leu-Phe (D/R 1.2). Some chemikinesis was seen with all the above but was greatest for MDP and DLE. In conclusion, lymphocytes exhibit chemotaxis in vitro, but not toward agents putatively attractive for neutrophils. In vivo chemotaxis may be partially responsible for the accelerated lymphocyte emigration seen following introduction of antigens or adjuvants.