

RAPID ISOLATION OF HIGHLY PURE T, B, AND NK CELLS IN 8 MINUTES

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Studying the complex interaction between the immune system and cancer requires the isolation of highly pure cell populations, an often time-consuming step in the experimental workflow. To streamline this step, we have developed improved EasySep™ kits for the isolation of human T, B and natural killer (NK) cells in as little as 8 minutes. The improved kits offer the fastest method for isolating untouched human lymphocyte subsets from fresh or previously frozen peripheral blood mononuclear cells (PBMCs), or from leukapheresis samples, without the need to lyse red blood cells.

The column-free, immunomagnetic EasySep™ negative isolation procedure involves labelling and removing unwanted cells using bispecific antibody complexes, which crosslink cell surface antigens to magnetic particles, then separating the cells using a magnet. To achieve faster and simpler separations we have developed novel magnetic particles, EasySep™ Dextran RapidSpheres™, which provide rapid magnetic labelling and separation. The EasySep™ antibody cocktail is added, followed by a 5-minute incubation. The magnetic particles are then added, and the sample tube is placed immediately into a hand-held EasySep™ magnet. After a 3-minute separation, the desired cells are collected by simply pouring the sample into a new tube.

Our new kits offer a large improvement in speed without any compromise in the quality of the isolated cells: purities of $97.5 \pm 0.4\%$ (average of $n=10 \pm SD$) were achieved for $CD3^+$ T cells, 96.5 ± 0.9 ($n=10$) % for $CD4^+$ T cells, $87.8 \pm 3.2\%$ ($n=10$) for $CD8^+$ T cells, $95.5 \pm 2.2\%$ ($n=18$) for B cells, $95.8 \pm 1.6\%$ ($n=18$) for naïve B cells, and $84.0 \pm 8.1\%$ ($n=66$) for NK cells. We additionally show that the isolated cells are functional; for example, they can be readily expanded *in vitro*. The new 8-minute EasySep™ cell isolation kits facilitate the preparation of highly purified untouched and functional cells.