

# HOW 4LIFE TRANSFER FACTOR® CAN MODULATE THE IMMUNE SYSTEM AND HELPER T CELL ACTIVITY\*

Technical White Paper

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## OBJECTIVE

This study assessed the effects of 4Life Transfer Factor on Helper T cells from people who had either taken transfer factors or who had not.

## BACKGROUND

Transfer factors were discovered decades ago, and their effects on immune system function are well documented. However, little is known about how these small proteins affect the function of individual immune system cells.

Recent developments in cellular separation use small magnetic beads to separate a single type of immune system cell from whole blood. This allows for an unprecedented look at how transfer factors affect the function of a single cell type.

Utilizing this technology, we assessed the effects of 4Life Transfer Factor on the activity of isolated CD4 Helper T cells from healthy donors. Helper T cells help coordinate overall immune system response. These cells do not attack invaders; they attract other immune system cells to the site of invasion. This study looked at how 4Life Transfer Factor can calm down an overactive immune system.\*

## STUDY

In this experiment, we used an FDA-approved diagnostic test (ImmuKnow®) to examine the effects of isolated CD4 Helper T cells incubated with 4Life Transfer Factor.

We collected blood via venipuncture from healthy individuals. We added this blood to a 96-well plate. We added various test substances and phytohemagglutinin (PHA), an immune system stimulant, to specific wells, and we left the whole plate to incubate overnight in a controlled environment.

After incubation, we added the magnetic microbeads to the wells and mixed them. Using powerful magnets, we removed the Helper T cells from the blood and washed them. Then, we removed the magnets. We then broke open the Helper T cells and measured their ATP content. ATP provides an indication of how active cells are. The PHA-induced activity of Helper T cells differed between people taking 4Life Transfer Factor and those not taking 4Life Transfer Factor.\*

## RESULTS AND DISCUSSION

ATP levels were significantly different for many of the groups (see Figure 1). PHA controls are the samples where just PHA was added. Those taking 4Life Transfer Factor showed a reduced response to PHA with every concentration of 4Life Transfer Factor that we tested. Those who were already taking 4Life Transfer Factor showed a greater calming effect than those who had never taken 4Life Transfer Factor.\*

Comparisons between 4Life Transfer Factor consumers and non-4Life Transfer Factor consumers at the same transfer factor concentrations showed significant differences at the two higher concentrations. We added PHA to every well to stimulate ATP production. In some wells, we added 1 mg of 4Life Transfer Factor, we added 5 mg in other wells, and we added 10 mg to a third set of wells. The low concentration group was the 1 mg, and the high concentration was the 10 mg. The two higher concentrations were also significantly different from the lowest concentration among 4Life Transfer Factor consumers.\*

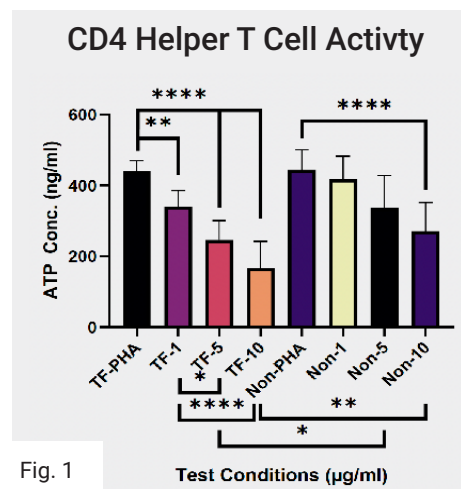


Fig. 1



## CONCLUSION

ATP production is a good measure of overall cellular activity. In this experiment, we looked at the effects of a non-specific immune system cell stimulant, PHA, on the ATP levels of CD4 Helper T cells obtained from healthy individuals who were either currently taking a 4Life Transfer Factor supplement or had never taken such a supplement.\*

In general, increasing concentrations of 4Life Transfer Factor led to reduced ATP levels in both groups, more so in those already taking 4Life Transfer Factor. This reduction in ATP means that 4Life Transfer Factor had a calming response when immune system cells were overactive. PHA can cause immune system cells to overreact, but 4Life Transfer Factor helped calm the overactive cells.\*

In summary, this preliminary ex vivo study provides evidence that 4Life Transfer Factor can reduce an overactive immune system response and that prior consumption of 4Life Transfer Factor can further improve immune system modulatory response.\*