

# Effect of Transfer Factor Advanced Formulas Containing E-XF Blends on Natural Killer (NK) Cell Activity

A 4Life Summary of an Independent NK Cell Study Report  
by Calvin W. McCausland, Ph.D. and Emma Oganova M.D., Ph.D.

## Summary

**Objective:** To determine the extent to which Transfer Factor E-XF blends and 4Life Transfer Factor Plus Advanced Formula increases Natural Killer (NK) cell activity above baseline.

**Study Design:** The blinded cytotoxicity study was designed by Dr. E. Oganova and Dr. C. McCausland. The independent testing of the coded samples was done under the direction of Academician Anatoly Vorobiev, M.D., Russian Academy of Medical Sciences (RAMS) and the experimental work was conducted by, Dr. M.V. Kisielevsky, Dr. E.O. Khalturina, at the Russian Cancer Research Center, RAMS.

**Methods:** Blood was obtained from RORC donor station. A standard method of density gradient was used to isolate mononuclear cells [NK Cells]. The isolated cells, 60 thousand cells per well, in 100 ml of culture medium, were introduced into each well of Costar 96 well plates. Then, portions of coded test samples [Transfer Factor E-XF blends of selected ratios, 4Life Transfer Factor Plus E-XF blend and others samples] were introduced into the wells at predetermined concentrations (wt./vol.). An Interleukin-2 (IL-2) standard was used to compare effectiveness. The preparations were incubated in a CO<sub>2</sub>-incubator with a 5% CO<sub>2</sub> atmosphere, 100% humidity and 37° C

for 24 or 48 hours. Next 30 thousand K-562 tumor cells (erythroblastic human leukemia) were introduced into the wells. (Thus, the ratio of effector and target cells was 2:1. Each sample was tested in triplicate). The preparations containing both the effector (NK cells) and target cells (K562 cancer cells) along with control wells were again incubated for 18-24 hours under the same incubator conditions. An MTT (dye) solution was used to spectrophotometricly determine the number of viable cells remaining in each well. The cytotoxic index (CI) expressed in % is reported for each sample.

**Results:** Each of the samples significantly increased NK cell activity. The Transfer Factor E-XF Blend (Advanced Formula) resulted in greater NK cell activation (283%) than the Transfer Factor XF (204%). 4Life Transfer Factor Plus Advanced Formula increased NK cell activity by 437%. The drug IL-2 increased NK cell active by 389%. In the study activation by 4Life Transfer Factor Advanced Formula, 4Life Transfer Factor Plus Advanced Formula and IL-2 resulted in a kill rate of K562 cancer cells of 69%, 97% and 88% respectively with the 48 hour incubation period giving the greatest NK cell activation.

## **Discussion**

As previously reported in earlier publications two 4Life products, 4Life Transfer Factor Classic and 4Life Transfer Factor Plus, have been shown to significantly improve NK cell activation, 103% and 248% respectively. When the transfer factors from patented egg technology are combined with bovine transfer factors there is a synergistic activation of NK cell activity. The improved formulas, 4Life Transfer Factor and 4Life Transfer Factor Plus Advanced Formulas improve NK cell activation by 283% and 437% respectively.

4Life researchers and scientists in developing the Advanced Formulas were confident that the colostrum derived transfer factors when combined with the egg derived transfer factors (E-XF blends) would enhance the activity and benefit of the products, but we too were taken by surprise by the magnitude of the increase. Further research needs to be done to better understand why this synergism occurs. We are confident these results will translate into increased benefits to consumers and increased clinical effect in future studies.

This study was conducted under the direction of Dr. Anatoli Vorobiev by his colleagues of the Russian Academy of Medical Science. Using established methods of cytotoxicity testing, NK cells from humans were combined with cancer cells and divided into groups of transfer factors activated NK cells and groups of unactivated NK cells. The objective was to find the bovine and egg transfer factor blend(s) (E-XF blends) that express the greatest NK cell activation. The results enable us to identify the most potent combination that will provide the greatest health benefits.

In the control series of the experiments for all of the transfer factor samples tested there was no direct cytotoxic effect on tumor cells at any of the concentrations tested. When in the absence of the immune NK cells the transfer factors are combined directly with the cancer cells there is no cytotoxic effect on the tumor cells.

Results of this study clearly demonstrated that 4Life Transfer Factor Advanced Formula and 4Life Transfer Factor Plus Advanced Formula boosts NK cell activity. The independent research scientists who conducted this study found the results interesting and so exceptional as to request further information on the identity of 4Life samples so that results could be published in professional journals. Statements from researchers included the following: "The 4Life sample activated NK cell activity more than the Interleukin-2 (IL-2) drug used as the standard. Here, we now refer to your sample as the Golden Interleukin," stated Dr. Kisielevsky, Russian Academy of Medical Sciences.

We strongly believe that these results are certain to be reflected in improved human health resulting from significantly improved immune response. It is our hope that people everywhere will find that 4Life Transfer Factor Advanced Formula and 4Life Transfer Factor Plus Advanced Formula will provide safe broad-spectrum immune support that is unmatched in any other health supplement today.