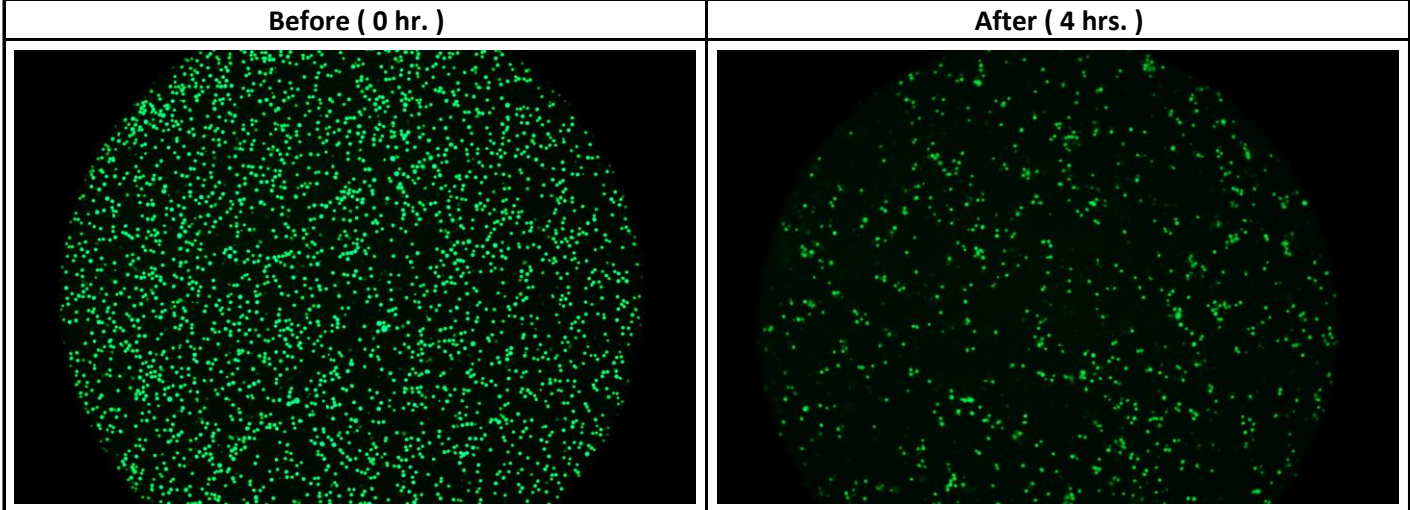


LABORATORY REPORT

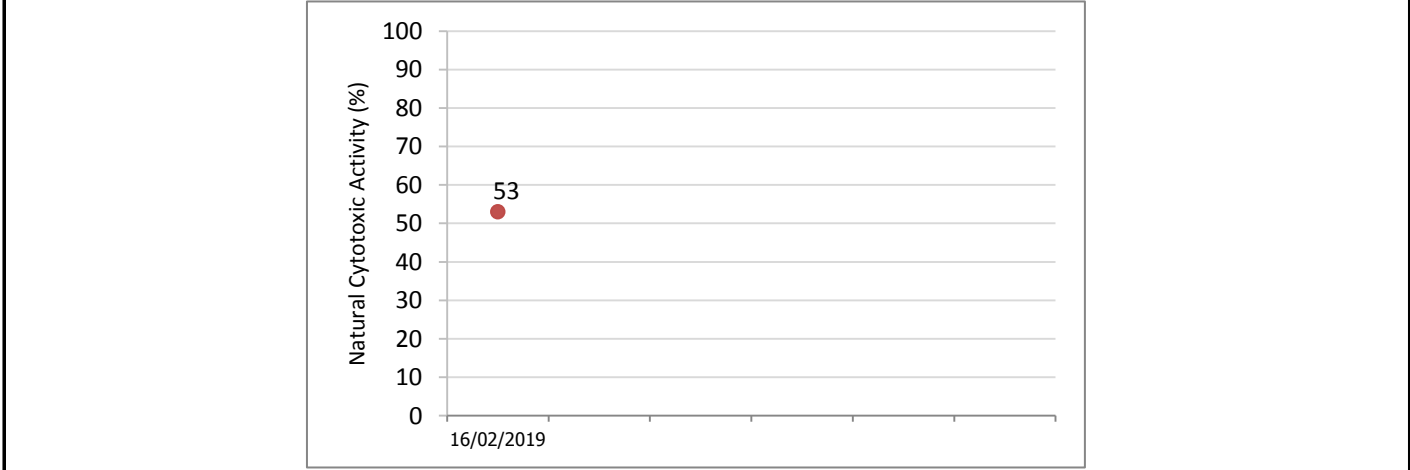
Test	Result	Unit	Flag	Reference range	Specimen	Method
Natural Cytotoxic Activity	53	%	H	Male: 43 - 58 % Female: 35 - 51 %	Heparinized-blood	Microfluorometer

Remark: (H) mean higher than reference range; (N) mean within reference range; (L) mean lower than reference range

FIGURE



HISTORICAL CHART



comment:

*** End of Report ***

Reported by :



Approved by :



ห้องปฏิบัติการรับรองผลการทดสอบเฉพาะรายงานฉบับจริงหรือสำเนารายงานที่มีข้อมูลครบถ้วนทั้งฉบับเท่านั้น



Natural cytotoxic activity interpretation

Natural cytotoxic activity interpretation can be divided as below list;

- **Low level** indicates that the effectiveness of the immune cells in responds to tumor or infected cells is low. The causes of reducing natural cytotoxic activity in blood are
 1. Patient and/or people who have a family member with cancer e.g. lung cancer, breast cancer, liver cancer, cervical cancer and ovarian cancer.
 2. Inappropriate lifestyle e.g. heavy smoking, sleep deprivation or sleep less than 7 hours/day, severe stress and overweight.
 3. Malnutrition results from intake diet in the wrong proportion e.g. lacking consume fruits, vegetables or soy proteins.
 4. Patient is receiving drugs such as immunosuppressant or chemotherapy.
 5. Patient after surgery.
 6. Patient who has some disease e.g. perforin deficiency, *NEMO* mutation.
- **Normal level** indicates that your immune cells are in the normal health status.
- **High level** indicates that your immune cells look like more active. This level indicates that you may in healthy stage from maximal exercise. However, it may be interpreted as infectious state or have the risk developing to age-related diseases such as Alzheimer's disease.

What is the immune system?

Immune System

The immune system is the body's defense against infection and cancer. The immune system can be classified into the innate immune system, e.g. neutrophils, macrophages, dendritic cells, natural killer cells; and the adaptive immune system, which operates through neutrophils and will function when stimulated by external or internal foreign substances.

The strength of the immune system usually declines as the organism gets older. A study found that at the age of 40, the strength of the immune system will decrease by 50% and when the person is reaching the age of 70, only 10% of the system's capability will remain. For that reason, it is very important to prepare ourselves and prevent the loss of immunity as it will lead to negative consequences on the person's wellness. The strength of the immune system is not only responsible for battling against infection, but also for the protection of blood and body fluids in the entire system, and for maintaining the stability of the internal system (Homeostasis). If the strength of the immune system diminishes, the ability to prevent and battle against infection and cancer cells will decrease too. When the body encounters inappropriate environments, it will have the tendency to become afflicted more easily. Therefore, the level of immunity in the body is the core indicator of the body's wellness. If the ability of the immune system is above the standard, it means that the person is healthy.

It is highly suggested that we always keep our health stable. If we find that the ability of the immune system is below the standard, the best solution is to find the actual cause of it in order to be able to select the right treatment. There are several factors that are associated with the immunity level, such as stress, inappropriate lifestyle, illness, etc.

Immunosurveillance Concept

Immunosurveillance Concept, or the concept of using the immune system to battle against cancer cells, is the mechanism by which cancer cells are randomly destroyed by the immunity. The key cells of this mechanism are called natural killer cells. This type of cells will stimulate white blood cells, such as macrophages, K cells and NKT cells so as to be able to kill the cancer cells through a mechanism that differentiates foreign cells from NK cells.

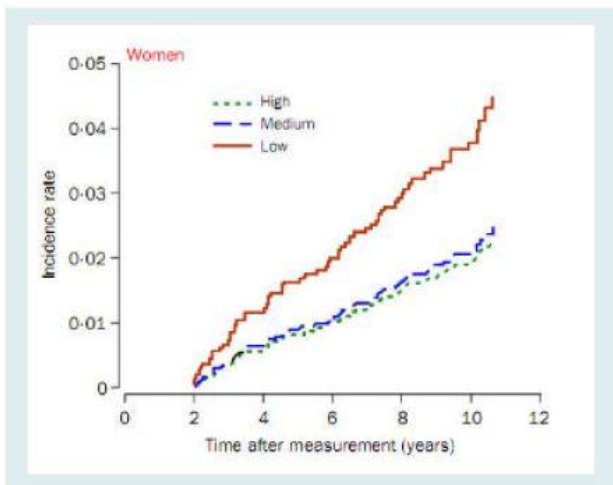
Natural Killer Cell (NK-cell)

Natural killer cells are a type of cell in the non-specific immunity. Their function is to destroy foreign cells that have entered the body, such as virus-infected cells or cancer cells, and to stimulate other cells in the immune system to function more effectively. According to the study, NK-cells are used to calculate the risk of cancer. Those who have low NK-cell activity will have a higher risk of cancer than those who have high NK-cell activity. The average level of NK-cell activity for males is 43-58% while it is 35-51% for females. However, having a high amount of

NK cells in the body doesn't necessarily mean that the person has high NK-cell activity since it is not guaranteed that the NK cells will be able to function perfectly. Today, Japan, the US and several more countries treat patients using the autoimmunity method, a method by which the autoimmunity is cultured, multiplied and stipulated in the laboratory to become a particular type of white blood cells that can destroy cancer cells. The white blood cells will be injected into the patient's body to destroy the targets, or cancer cells, entirely. It is found that immunotherapy helps increase the ability to prevent illness, yield a better result in cancer treatment as well as avoid the recurrence of illness. Patients will become much healthier during the treatment procedures as they wouldn't have to experience severe pain and side effects that would also destroy the good cells as a result of certain medical treatments.

1. Factors associated with NK-cell activity

1.1 Stress: Stress, either caused by internal mentality or external factors, usually affects the balance of the body significantly. It is very important to relieve the stress as it may cause a slowdown in the ability of NK-cell activity, a dysfunction in the organism and the immune system as well as the tendency to become afflicted easily. Furthermore, those who have bipolar disorder or who are extremely reserved would have lower NK-cell activity than those who are emotionally stable.



According to the graph, persons with a high risk of cancer have lower NK-cell activity than normal people, which also means a higher chance for cancer.

The graph shows the correlation between the formation of cancer and the level of natural cytotoxicity.

1.2 Lifestyle patterns that affect NK-cell activity include:

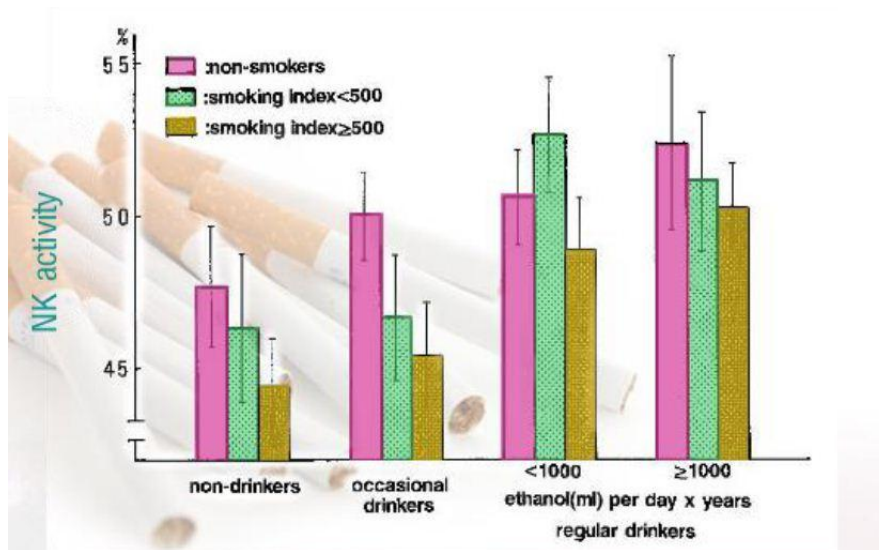
- Eating habits: It is found that those who consume leafy green vegetable daily have higher NK-cell activity than those who consume it only once a week. The result would be more visible in females than males. It is also found that daily consumption of meat, dairy products and soy beans can increase NK-cell activity as well.

- Irregular meal timing is also associated with the decrease of NK-cell activity. According to the study, those who consume three meals a day and do not eat between meals have significantly higher NK-cell activity than those who opt for irregular meal timings.

Proper consumption of nutritious food to maintain a healthy weight is another factor that supports NK-cell activity. Overweight persons will have lower NK-cell activity compared to those who have a healthy weight.

- Adequate rest also helps increase NK-cell activity. The study found that those who sleep for more than 7 hours will have significantly higher NK-cell activity than those who sleep less than 7 hours. However, sleeping hours vary for each individual, depending on, for example, a person's quality of sleep.

- Excessive smoking would weaken NK-cell activity. The study found that smoking more than 500 cigarettes a year will decrease NK-cell activity. In addition, although slight alcohol consumption (<1000ml/year) will help boost NK-cell activity, the combination of alcohol consumption and cigarettes will drastically decrease NK-cell activity.



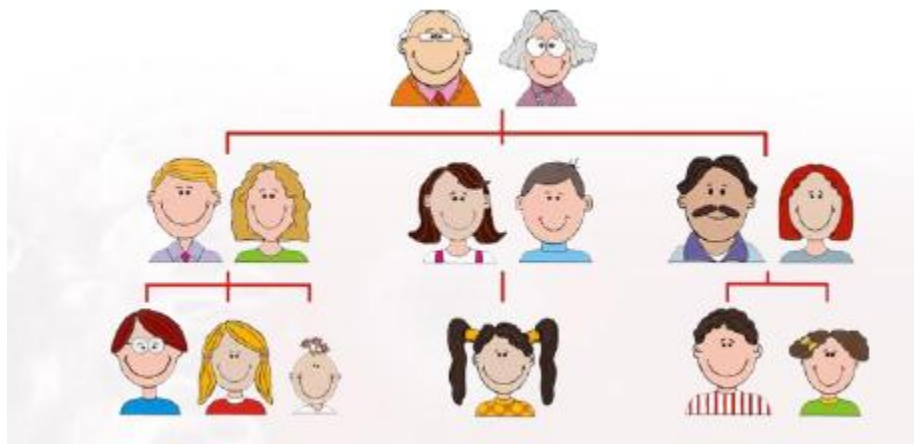
The graph shows the correlation between NK-cell activity levels and smoking habits.

1.3 The list of chemotherapy that affects natural cytotoxic activity

Inhibit NK Cell Activity	Marginally Suppressive
<ul style="list-style-type: none">● Chlorambucil● MG-132● Docetaxel● Cladribine● Paclitaxel● Bortezomib● Gemcitabine● Vinblastine	<ul style="list-style-type: none">● Oxaliplatin● Dactinomycin● Cytarabine● Daunorubicin● Vincristine● Topotecan

1.4 Persons whose families have a history of cancer

According to the research, the persons whose family has a history of cancer have lower natural cytotoxic activity level than those without a history of cancer.



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