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MAHARAJ
Institute of Immune
Regenerative Medicine

STEM CELLS & AGING

While living longer with good health is one of life's greatest desires, the reality is that we are more likely to see our health decline with age. The weakening of our immune systems is an unfortunate result of aging, with a rapid decline typically occurring around 65 years. This results in an increased risk for disease; however, this normal decline is not the same for everyone. Some individuals have a better immune system than others even at an older age. The main questions are why does this occur and what can be done to preserve it?

It is believed that as we get older, certain blood proteins that contribute to the aging process begin creating an adverse effect on our stem cells, which are the cells that comprise the immune system. In the quest for more answers, a researcher decided to look at Dutch supercentenarian, Hendrikje Van Andel-Schipper, who lived to be 115 years old.

After Van Andel-Schipper's death, researchers looked to see if they could determine the cause of her long life. It was found that she passed away due to stem-cell exhaustion. The belief is that there is a certain limit to how often one's stem cells can divide throughout a person's lifetime and once that limit has been reached, death follows. But if the time frame for stem cell division can be replenished or extended, then a person's life span could possibly also be extended. Investigations led scientists to believe that perhaps the solution lies in the plasma.

In research on blood plasma and its relation to frailty, a study pinpointed that the expression of certain proteins within our plasma strongly correlates to frailty and that these proteins are negatively affected by aging. This knowledge might allow us to determine at an earlier age what that individual's likelihood for frailty will be.

In the study "Plasma Proteomic Profile of Frailty," a Somascan assay was used to measure a total of 4,265 proteins in the plasma of individuals, with the intention of determining which specific proteins had either a positive or a negative association with frailty. Basing the results against a cumulative frailty index (FI), the results showed that of the 4,265 proteins measured, 55 were positively associated and 88 were negatively associated with the FI.

These results indicated that the proteins with the strongest association to frailty consisted of:

·Fatty Acid-Binding Protein (FABP), which is expressed within the heart and skeletal muscle.

·FABPA Adipocyte, which is closely linked to obesity and metabolic syndrome.

·Leptin, which is a hormone involved in maintaining body weight and energy balance.

·Interleukin-1 Receptor Antagonist Protein (IL-1Ra), which plays a significant role in cardiovascular outcomes and inflammation within the body.

The expression of these proteins became more pronounced when frailty was increased.

Researchers were able to construct a frailty prediction model utilizing not only the proteins listed above, but with a total of 110 proteins. The model showed that predicted frailty strongly correlated to observed frailty, as well as to chronological age. This led to the understanding that analyzing these specific proteins could be a way to predict frailty.

The ability to predict frailty in individuals based on their protein expression may help those who are destined to develop diseases of aging that would shorten their health span. One thing that could be done to preserve the immune system prior to its decline is to harvest healthy stem cells and plasma, and store them for future use.

To learn more about the diseases of aging, maintaining a healthy immune system, and harvesting yours before it declines, please contact the Maharaj Institute at 561-752-5522 or email us at info@bmscti.org.

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