# NEWS

## Integrin, Bad Cholesterol, and Cancer

Metastasis is a pivotal step in cancer. This process allows the cancer cells to break away from the primary tumor and spread to other body parts. This makes cancer difficult to cure, and it is a major cause of death from cancer.

Integrin not only binds and communicates; it also helps in the cancer cell survival.[1] This protein is responsible for both inside-out since outside-in cell signaling. In cancer tissue, the integrin expresses inside-in signaling. Integrin beta 1 coordinates with c-Met protein and both travel together inside cancer cell.[2] Together they send a signal to surrounding area of cancer cell facilitating defense against cell death resulting in cancer cell survival. Furthermore, integrin provides traction. Therefore, migrating cancer cells express integrin as it provides traction to escape existing tumor and travel far away. However, trials with integrin inhibitors were not successful which made the researchers delve further into this protein's physiology.

The starting point is that integrin can move from cell surface to interior. What prevents it is the presence of cholesterol. Thomas Freak from Sydney discovered that the low-density lipoprotein (LDL) cholesterol also is involved in the trafficking of tiny vessels containing integrins.[3] Therefore, LDL cholesterol or the bad cholesterol integrin to transport cancer cells indirectly. In contact, the good cholesterol high-density lipoprotein was found to do the opposite action by keeping integrin inside cells.

### References


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## Changing Science behind Gray Hair

Hair graying can be described as the loss of pigment production and deposition within the hair shafts. It is a sign of aging. Several mechanisms are responsible for graying of hair. The melanocyte makes the pigments and passes into hair progenitor cells. During the course of hair growth, these pigments are incorporated continuously, thus giving the color to our hair. Eumelanin is responsible for black and brown hair while pheomelanin gives orange and yellow color. The combination of both makes different hair color and this is predetermined by our gene. When melanocytes get damaged or get lost, hair lacks in color and turns gray or white. The hair progenitor cells release a protein called stem cell factor, essential for the production of pigment. In mouse experiment when this protein was removed, the mice hair lost its color. Normally, a follicle produces one-centimeter hair per month for several years. As hair damage increases with age melanocytes keep getting lost. After all melanocytes are lost, hair eventually turns gray.[1] The melanocyte stem cell directly adheres to hair follicle stem cells forming a stem cell system within individual hair follicles. Once hair stops growing, hair follicle undergoes changes since it enters resting phase. Although melanocytes die at this time, the stem cells at hair follicle base produce a new set of melanocytes.[2] Without the pool of stem cells, subsequent round of hair growth would proceed without its color leading to graying of hair.

Age is the most important and uncorrectable coronary risk factor at the moment. Recently, it was found that degree of gray/white hairs is related to the extent of coronary artery disease (CAD).[3,4] The authors concluded from their observation that hair graying is a risk marker for CAD independent of age and other traditional risk factors. This study has emphasized the concept of measuring aging biologically rather than chronologically. Human hair follicles are a target of multiple neuromediators and neurohormones such as proopiomelanocortin, adrenocorticotropic hormone, melatonin, alpha melanocyte-stimulating hormone, and β-endorphin. Therefore, the incidence of premature graying of hair though harmless may indicate loss of balance of multiple control mechanisms.

### References


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# VIEWS

## Gender of Fetus Can Affect Mother's Health Long after Delivery

It has been long believed that maternal health is a key factor affecting fetal health. However, can fetal characters influence mother's health too? Recently, it was found that reverse can also be true. Fetal gender is recently found to affect postpartum maternal health. According to Amanda Mitchell, a postdoctoral research fellow from Ohio State University Wexner Medical Center, the glycemic status, blood pressure, and cortisol levels in mother can differ according to gender of fetus. Eighty pregnant women were examined in early, middle, and late stage of their pregnancies. Forty-six were pregnant women and 36 with females. Their immune cells were exposed to bacteria and checked for responses. It was found that presence of female fetuses raised the pro-inflammatory cytokine levels in the mothers. Although cytokine is part of immune system, persistent release leads to diseases related to inflammation. Although cytokine level did not show difference between the groups, on exposure to bacteria, the inflammatory response was higher in mothers with female fetuses.

In another 4 years long, study conducted in hundreds of thousands of women of Ontario, the risk of greater pregnancy-associated metabolic changes such as gestational diabetes mellitus (GDM) was linked with male fetuses. Dr. Baiju Shah published a related article in Journal of Clinical Endocrinologist Metabolism. On the other hand, it was also seen that GDM mothers with female infants showed a greater risk of developing into type 2 diabetes mellitus. Such revealing facts indicate that mother and her children share a bond lifelong beyond 9-month connection.

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