ANGIOGENESIS AND CANCER
FACT SHEET

What is angiogenesis?

- Angiogenesis is the growth of new blood vessels within the body.[1] Angiogenesis occurs in healthy individuals during wound healing, female menstruation and pregnancy.[1]

- The angiogenic process is complex. Angiogenesis occurs via pathways involving families of proteins and their receptors. Important proteins involved in angiogenesis are vascular endothelial growth factor (VEGF), platelet derived growth factor (PDGF).[1]

- In many serious diseases the body loses control over angiogenesis, which results in the excess or insufficient growth of new blood vessels.[1] In these conditions, new blood vessels feed diseased tissues or destroy normal tissues.[1] In the case of cancer, the new vessels allow tumor cells to grow and sometimes spread through the circulation system, causing tumor metastases.[1]

Role of VEGF and PDGF

- VEGF and PDGF bind to their respective receptors, the VEGF receptor (VEGFR) and PDGF receptor (PDGFR), to activate signals within the cell that result in cell replication, migration and differentiation.2

- VEGF is a growth factor essential for angiogenesis. VEGF can promote cell survival and blood vessel growth. Its expression is increased in the majority of tumors, including cancers of the liver, lung, breast, kidney, bladder, prostate, ovaries and colon. [3]

- PDGF also plays a role in angiogenesis. PDGF controls cell growth and changes in cell shape. Similarly to VEGF, increased PDGF expression has been linked to a number of tumors.[4,5]

Role of anti-angiogenesis therapies

- Anti-angiogenesis therapies prevent the growth of new blood vessels, thereby blocking tumor growth. These agents are being investigated in the monotherapy setting, as well as in combination with traditional chemotherapies.[6]

- Blood vessels in tumors are irregularly shaped, highly permeable, and tortuous, resulting in inefficient vascular supply. Because of this abnormal vasculature, drug delivery of standard therapies is generally impaired in tumors.[7]

- Anti-angiogenic therapies target tumor vasculature and may be able to circumvent these challenges. Emerging evidence suggests that anti-angiogenic drugs can normalize the structure and function of blood vessels, thereby improving drug delivery. [7]

References

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