**Extracellular Matrix**

Name:

Institution:

Course:

Professor:

Date:

**Extracellular Matrix**

1. Cancer treatments - what are various treatments available and their impacts. As mentioned in the article.

There are various cancer treatments that are currently available, and they include surgery, radiotherapy, immunotherapy, and chemotherapy. These treatment approaches present with significant impact as some affect the systemic health tissues. For instance, chemotherapy produces systemic side effects, such as fatigue, hair loss, nausea, vomiting, and anemia. Radio therapy impacts the healthy tissues, damaging the healthy cells by destroying genetic materials that determine how cells grow and divide (Schaefer & Reinhardt, 2016).

1. Describe the nature/composition of the ECM for the tumors (6-7 lines)

Metastisis of a tumor is the spread of tumor cells from the primary tumor to a secondary site, and this is the major cause of cancer-related deaths. Understanding the role of microenvironment in cancer progression is critical in the prevention and treatment of cancer. The extracellular matrix (ECM) in the cancer microenvironment is a non-cellular network of cross-linked macromolecules including structural proteins, proteoglycans, glycoproteins, and collagens that a form a diverse network of structures (Schaefer & Reinhardt, 2016). The ECM is a focal entity where signals of many cell-derived factors integrate to regulate tumor function. The ECM provides physical and chemical cues that influence how cancer progress and the process of metastisis. Collagen are the most abundant protein in the ECM and they play a critical role in tumor cell growth, migration, and metastisis (Schaefer & Reinhardt, 2016). Other ECM components such as structural proteins are also expressed in metastatic tumor and they provide niches for cancer stem cells. The understanding of the nature of tumor cells and ECM within the cancer microenvironment provides insight into the mechanisms underpinning tumor progression and the process of metastisis.

2. Pick any one section from sections 2-5 and write a brief summary for the content of that section. (5-6 lines). Mention which section you chose in your report.

Part III summary

In part III of this editorial, the authors focus on the role of ECM proteins and receptors during drug delivery. The ECM is a crucial element in the process of metastisis as it involves modulating the behaviors of tumor and non-malignant stroma cells in all stages of metastisis (Schaefer & Reinhardt, 2016). Collagen are the most abundant ECM proteins in the body and they play a vital role in tumor cell growth, migration, and metastisis. These proteins have excellent biocompatibility and biodegradability, which make them useful for drug delivery and targeting vehicles (Schaefer & Reinhardt, 2016). There are also the polypeptides, which are elastin-like and are based elastin fragments. These chemical compounds can readily self-assemble, and thus they allow the generation of carrier systems that can be exploited during drug delivery in cancer and other diseases. Other ECM proteins are the fibroblasts, which are the main source for ECM in the body tissues. There are also the integrins αvβ3, αvβ5, and α5β1, which are essential in tumor angiogenesis and are specifically expressed in cancer cells (Schaefer & Reinhardt, 2016). Integrins are also responsible for the migration and proliferation of cancer cells through their interaction with ECM proteins. This section also examines the value of protease systems in the ECM microenvironment.

**Reference**

Schaefer, L., & Reinhardt, D. P. (2016). Special issue: Extracellular matrix: Therapeutic tools and targets in cancer treatment. *Advanced Drug Delivery Reviews*, *97*, 1–3. https://doi.org/10.1016/j.addr.2016.01.001