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LETTER TO THE EDITOR

Synemin: an evolving role in tumor growth and progression

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Dear Editor,

I read with great interest the recent article by Russ et al. [1]. Synemin plays a major modulatory role in tumor growth and progression in different systemic malignancies.

Synemin plays an important role in neurological tumors such as astrocytomas and glioblastomas. For instance, the leading edge of astrocytomas exhibit upregulated synemin levels. This has been confirmed by Pan et al. in a recent study [2]. As a result, simultaneous accentuation of actin and alpha-actin is seen in the leading edge. This further augments tumor cell motility and migration thuds promoting tumor growth. On the other hand, synemin silencing markedly decelerates tumor progression in astrocytomas [3]. In addition, tumor size is significantly attenuated by virtue of decreased rumor proliferation and increased tumoral apoptosis secondary to the silencing of synemin. Tumor cell proliferation in glioblastomas is also significantly augmented by synemin. It mediates this role by forming a complex with "protein phosphatase type-2A" [4]. The formation of this complex results in unhindered and augmented activation of Akt. In addition, synemin attenuates the expression of p21 (Cip1) within the malignant glial tissue [5]. A similar negative impact is seen on p27 (Kip1). The net result is augmented and accelerated G1/S phase transition [6]. In addition, survival of clone stem cells within the glioblastomas is significantly accentuated by synemin. Not surprisingly, synemin silencing results in hypo-phosphorylation of Rb and accentuated G1 phase arrest [7].

Synemin also influences tumor progression in mammary malignancies [8]. For instance, nearly 57 % of breast carcinomas exhibit loss of synemin expression. In 27 % of breast cancers, methylation of the synemin promoter is typically seen [9]. A close relationship exists between loss of synemin expression and synemin promoter methylation. Accentuated synemin promoter methylation is associated with augmented lymph node metastasis. A similar close and direct relationship has been seen between tumor grade, survival rate, and synemin promoter methylation [10]. For instance, the "recurrence free survival" is significantly attenuated following accentuated methylation of the synemin promoter. Synemin also plays an important role in tumor progression in hepatocellular malignancies [11]. For instance, malignant hepatic tissue exhibits attenuated synemin expression in contrast to higher levels noted in adjoining benign hepatic tissue [12].

The above examples clearly illustrate that synemin has a major role to play in the progression of systemic malignancies. Very little research has been done so far regarding its role in neoplastic growth. Further studies are urgently needed to further evaluate its potential significant role in oncology.

Conflict of interest No conflicts of interest.

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