ABSTRACT

Osteosarcoma (OS) is a neoplasm caused by the formation of an immature osteoid matrix and is derived from primitive bone-forming mesenchymal cells. OS is known to be the 7th most common primary bone cancer in childhood. OS is also known for its high proliferation ability and several mechanisms may be involved. Several pathways are linked to the progression and growth of cancers including the hippo pathway. The hippo pathway phosphorylates Yes-associated protein (YAP) to control its transactivation activity in gene expression. Cytidine triphosphate synthase (CTPS) is one of the crucial enzymes that provides structural components of DNA and RNA in the *de novo* synthesis, CTPS has two isoforms CTPS1 and CTPS2. CTPS1 can compartmentalize into filament-like structures across species under stress conditions such as nutritional deprivation. Glutamine is one of the most abundant amino acids in plasma which is utilized by cancer cells as a source of energy and building blocks for macromolecules in their growth and proliferation while the pro-oncogenes are activated. The lab and others found that Glutamine deprivation will lead to a disruption in the growth and proliferation of the cancer cells and this condition induces the formation of CTPS filament. CTPS filament production in human cancer cells facilitates metabolic adaptation under nutrition depletion. Here I investigate the relationship between CTPS filament formation and the YAP signaling under glutamine deprivation.

Keywords: Osteosarcoma; Glutamine; CTPS Filament