1. Human cells possess a finite replicative life span due to a process called senescence (also termed the "Hayflick limit"), a known tumor-suppressive mechanism. Based on your assigned readings, explain:

   A) what causes senescence? Describe the molecular processes involved as well as the known pathways leading to this irreversible cell cycle arrest. (4 points)

   B) senescence is often termed "M1", and can be followed by another stage called "M2" (crisis). What constitutes crisis in this context? (4 points)

   C) tumor cells are immortal in culture. Which activity confers immortality to tumor cells, allowing for the bypass of both M1 and M2? How does this allow for the bypass of M1, and why is senescence not induced? How does this allow the bypass of M2, and why is crisis not occurring? (4 points)

   D) discuss the importance of M1 and M2 in the context of cellular transformation, and whether targeting these steps could be effective cancer therapeutic strategies. (3 points)