and RET) and inhibits downstream Raf serine/theorine kinase (ARAF, BRAF, mutant BRAF V600E and CRAF) activity to prevent tumor growth by anti-angiogenic, antiproliferative and pro-apoptotic effects. (**Figure 11**).

[0011] Although targeted anti-cancer agents have been effective in the treatment of some human cancers, these agents are generally exhibit unpredictable efficacy, especially. in canines. Therefore, there is a need for improved methods and compositions for predicting efficacy and treating cancers in canine subjects with targeted anti-cancer agents.

SUMMARY

[0011a] In a first aspect, the present disclosure refers to use of Vorinostat in the manufacture of a medicament for treating a subject with a sarcoma harboring at least one mutation in p53 in a biological sample derived from the sarcoma, wherein the medicament is to be administered to the subject if there is at least one mutation in p53,

optionally further comprising identifying or having identified the at least one mutation in p53.

[0012] In certain examples, described herein is a method of treating a subject with cancer comprising the step of administering a therapeutically effective amount of a histone deacetylase complex (HDAC) inhibitor to a subject having a cancer harboring at least one mutation in ataxia-telangiectasia mutated (ATM) kinase. In certain examples, the method includes the step of identifying the mutation in a sample derived from the subject. In certain examples, the HDAC inhibitor is selected from the group consisting of: romidepsin, belinostat, panobinostat, vorinostat, givinostat, entinostat, tacedinaline, and mocetinostat. In certain examples, the HDAC inhibitor is vorinostat. In certain examples, the method, further comprises administering an effective amount of a DNA damaging chemotherapeutic agent. In certain examples, the DNA damaging chemotherapeutic agent is selected from the group consisting of: a DNA-alkylating agent, DNA crosslinking agent, antimetabolite, topoisomerase inhibitor and a DNA intercalating agent. In certain examples, the DNA-alkylating agent is selected from the group consisting of: a nitrosourea, a triazene and a platinum agent. In certain examples, the DNA-alkylating agent is a nitrosourea. In certain examples, the nitrosourea is lomustine. In certain examples, the method, further comprises performing surgery on the subject. In certain examples, the method further comprises administering an effective amount of at least one additional anti-cancer therapeutic agent. In certain examples, the method further comprises administering to the subject ionizing radiation. In certain examples, the cancer harbors more than one mutant allele of ATM kinase. In certain examples, the biological sample is a nucleic acid sample. In certain examples, the biological sample is a purified nucleic acid sample. In certain examples, the sample is DNA. In certain examples, the sample is RNA. In certain examples, the identifying is performed by sequencing a nucleic acid sample. In certain examples, the cancer is cancer in a canine subject. In certain examples, the cancer is selected from the group consisting of: solid tumor, lymphoma, cutaneous T-cell lymphoma,