

CLAIMS

What is claimed is:

1. A method for predicting response to treatment with 7-(6-(2-hydroxypropan-2-yl)pyridin-3-yl)-1-((*trans*)-4-methoxycyclohexyl)-3,4-dihydropyrazino[2,3-*b*]pyrazin-2(1*H*)-one or a pharmaceutically acceptable salt or tautomer thereof in a patient having hepatocellular carcinoma (HCC), the method comprising: a) analyzing a biological test sample from the patient for HBV infection; b) predicting an increased likelihood of response to treatment with 7-(6-(2-hydroxypropan-2-yl)pyridin-3-yl)-1-((*trans*)-4-methoxycyclohexyl)-3,4-dihydropyrazino[2,3-*b*]pyrazin-2(1*H*)-one or a pharmaceutically acceptable salt or tautomer thereof in the patient having HCC if HBV infection is determined in the sample.

2. A method for predicting therapeutic efficacy of 7-(6-(2-hydroxypropan-2-yl)pyridin-3-yl)-1-((*trans*)-4-methoxycyclohexyl)-3,4-dihydropyrazino[2,3-*b*]pyrazin-2(1*H*)-one or a pharmaceutically acceptable salt or tautomer thereof in a patient having HCC, the method comprising: a) analyzing a biological test sample from the patient for HBV infection; b) predicting an increased likelihood of therapeutic efficacy of 7-(6-(2-hydroxypropan-2-yl)pyridin-3-yl)-1-((*trans*)-4-methoxycyclohexyl)-3,4-dihydropyrazino[2,3-*b*]pyrazin-2(1*H*)-one or a pharmaceutically acceptable salt or tautomer thereof in the patient having HCC if HBV infection is determined in the sample.

3. The method of claim 1 or 2, wherein the HBV infection is determined by at least one of the variables selected from the group consisting of: patient history of HBV, prior or current treatment for HBV, cirrhosis attributed to HBV, the presence of HBV proteins or antigens, the presence of antibodies to HBV proteins or antigens, the use of HBV medications, the HBV viral load, the presence of HBV DNA and the presence of HBV mRNA.

4. The method of claim 3, wherein the HBV infection is determined by patient history of HBV; or

wherein the HBV infection is determined by prior treatment for HBV; or

wherein the HBV infection is determined by current treatment for HBV; or

wherein the HBV infection is determined by cirrhosis attributed to HBV; or
wherein the HBV infection is determined by the presence of HBV proteins or antigens; or
wherein the HBV infection is determined by the presence of antibodies to HBV proteins
or antigens; or

wherein the HBV infection is determined by the use of HBV medications; or
wherein the HBV infection is determined by the HBV viral load; or
wherein the HBV infection is determined by the presence of HBV DNA; or
wherein the HBV infection is determined by the presence of HBV mRNA.

5. The method of claim 1 or 2, wherein the HBV infection is determined by at least one of the variables selected from the group consisting of: the presence of HBV surface antigen (HBsAg), the presence of HBV core antigen (HBcAg), the presence of HBV envelope antigen (HBeAg), the presence of HBV x antigen (HBxAg), the presence of HBV core-related antigen (HBcrAg), the presence of antibody to HBV surface antigen (anti-HBsAg), the presence of antibody to HBV core antigen (anti-HBcAg), the presence of antibody to HBV envelope antigen (anti-HBeAg), the presence of antibody to HBV x antigen (anti-HBxAg), and the presence of antibody to HBV core-related antigen (anti-HBcrAg).

6. The method of claim 5, wherein the HBV infection is determined by the presence of HBsAg; or

wherein the HBV infection is determined by the presence of HBcAg; or
wherein the HBV infection is determined by the presence of HBeAg; or
wherein the HBV infection is determined by the presence of HBxAg; or
wherein the HBV infection is determined by the presence of HBcrAg; or
wherein the HBV infection is determined by the presence of anti-HBsAg; or
wherein the HBV infection is determined by the presence of anti-HBcAg; or
wherein the HBV infection is determined by the presence of anti-HBeAg; or
wherein the HBV infection is determined by the presence of anti-HBxAg; or
wherein the HBV infection is determined by the presence of anti-HBcrAg.

7. The method of any one of claims 1 to 6, wherein the HCC is unresectable HCC; or

wherein the HCC is previously untreated HCC; or

wherein the HCC is previously treated HCC, wherein the previous treatment comprises sorafenib; or

wherein the HCC is previously treated HCC, wherein the previous treatment comprises chemotherapy.