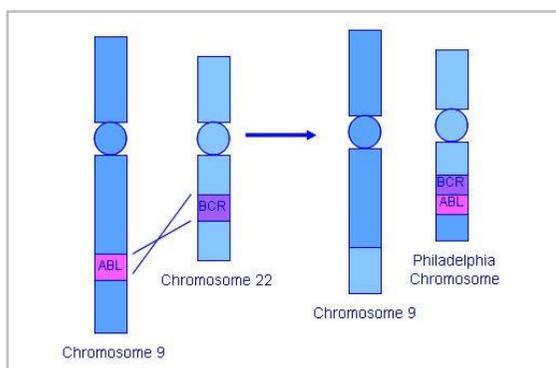


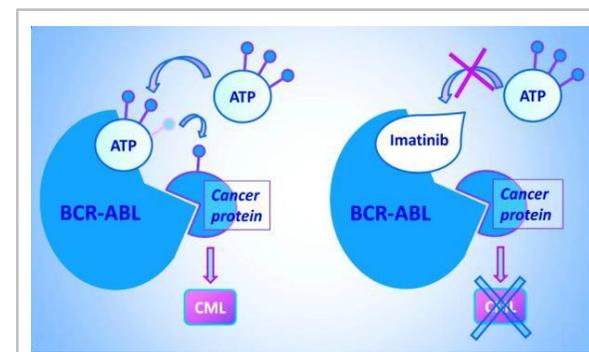
## BaF3-BCR-ABL & BaF3-BCR-ABL-T315I Stable Cell Lines - *In Vitro* Screening Tool for CML Drugs

BCR-ABL, or BCR-ABL1, is a fusion gene formed by the combination of two genes, known as BCR and ABL. BCR-ABL fusion gene is found in certain types of leukemia, for example, in almost all patients bearing chronic myeloid leukemia (CML), in some patients with acute lymphoblastic leukemia (ALL) and rarely in patients with acute myelogenous leukemia (AML).



**Figure 1.** Formation of BCR-ABL fusion gene

A series of specific small-molecule inhibitors have been designed to inhibit the tyrosine kinase activity of the Bcr-Abl oncoprotein, including Imatinib, Nilotinib and Dasatinib. Some of which have been approved for use in clinical, and several of which are in clinical trials.



**Figure 2.** BCR/ABL kinase inhibition by imatinib

### T315I mutation

The T315I is a missense mutation resulting in an amino acid substitution of BCR-ABL from threonine (T) to isoleucine (I) at position 315. T315I substitution leads to the absence of a critical hydrogen bond between imatinib and the ABL kinase, and alters the three-dimensional structure of the kinase protein binding site. Several studies have shown that presence of T315I in BCR-ABL1 mediates resistance to Imatinib and many TKIs except Ponatinib.

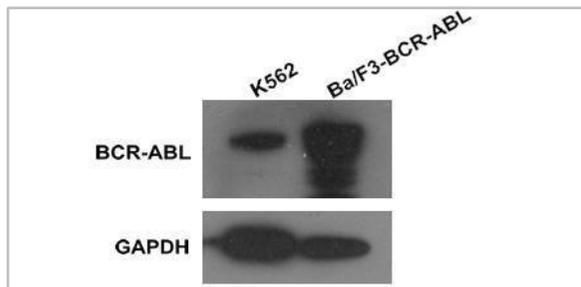
Creative Biogene has developed BCR-ABL Stable Cell Line - BaF3 [CSC-RO0124] and BCR-ABL-T315I Stable Cell Line - BaF3 [CSC-RO0125] which are suitable for use in cell-based in vitro screening of drug candidates against chronic myeloid leukemia.

### Why Using BaF3 Cell Line?

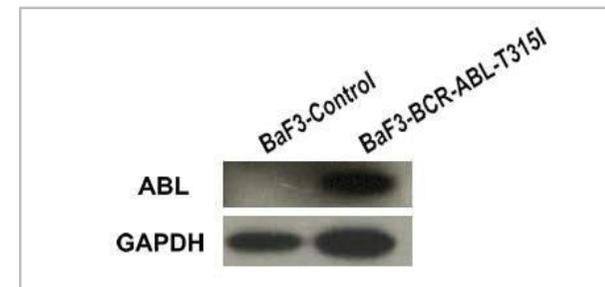
Ba/F3 is a murine hematopoietic cell line which is established from bone marrow of BALB/c mouse. IL-3 is essential for Ba/F3 cell maintenance. Several advantages have made this cell line to be a popular system in kinase drug discovery.

1. BaF3 grows in a fast speed which enables rapid experimental timeline;
2. BaF3 is suitable as a transfection or transduction host;
3. BaF3 becomes IL-3 independence when it constitutively expresses active tyrosine kinase through cell engineering.

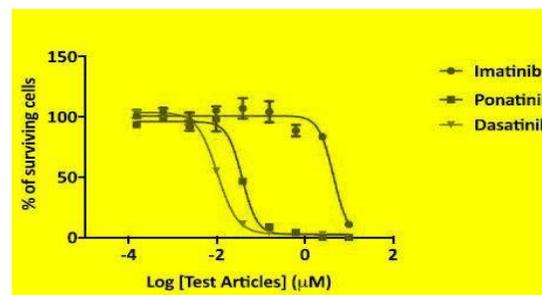
Our BaF3-BCR-ABL and BaF3-BCR-ABL-T315I stable cell lines are constructed by stable delivery of exogenous human BCR-ABL, BCR-ABL-T315I encoding sequences into BaF3 cell genomes which are mediated by retrovirus transduction respectively. Western blot analysis shows significant overexpression level of BCR-ABL, BCR-ABL-T315I in our cell lines. We have also tested the IC<sub>50</sub> of BCR-ABL known inhibitors including Imatinib, Ponatinib and Dasatinib.



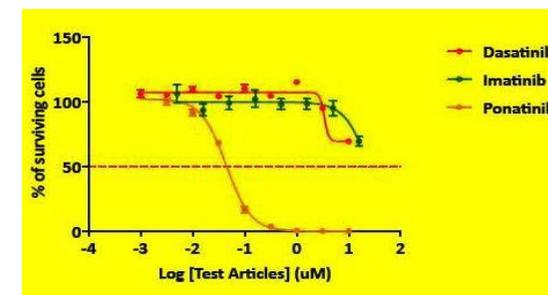
**Figure 3.** WB analysis of BCR-ABL expression



**Figure 4.** WB analysis of BCR-ABL-T315I expression



**Figure 5.** Kinase inhibitor analysis using our BaF3-BCR-ABL cell line. The IC<sub>50</sub> of Imatinib, Ponatinib and Dasatinib were 4.54 μM, 37 nM and 11 nM respectively.



**Figure 6.** Kinase inhibitor analysis using our BaF3-BCR-ABL-T315I cell line. The IC<sub>50</sub> of Dasatinib, Imatinib and Ponatinib were >10 μM, >10 μM and 45 nM respectively.

### Application

1. Cell-based screening of BCR-ABL tyrosine-kinase inhibitors (TKI)
2. Cell viability assay
3. *In vivo* efficacy study



### References

1. Weisberg E1, Manley PW, Cowan-Jacob SW, Hochhaus A, Griffin JD. Second generation inhibitors of BCR-ABL for the treatment of imatinib-resistant chronic myeloid leukaemia. *Nat Rev Cancer*. 2007 May;7(5):345-56.
2. Daigo A, Tetsuzo T, Seiichi O, Kousuke N, Kazuma O, Activity of a novel Aurora kinase inhibitor against the T315I mutant form of BCR - ABL: In vitro and in vivo studies. *Cancer Science*. 2008 June; 99 (6):1251–1257.