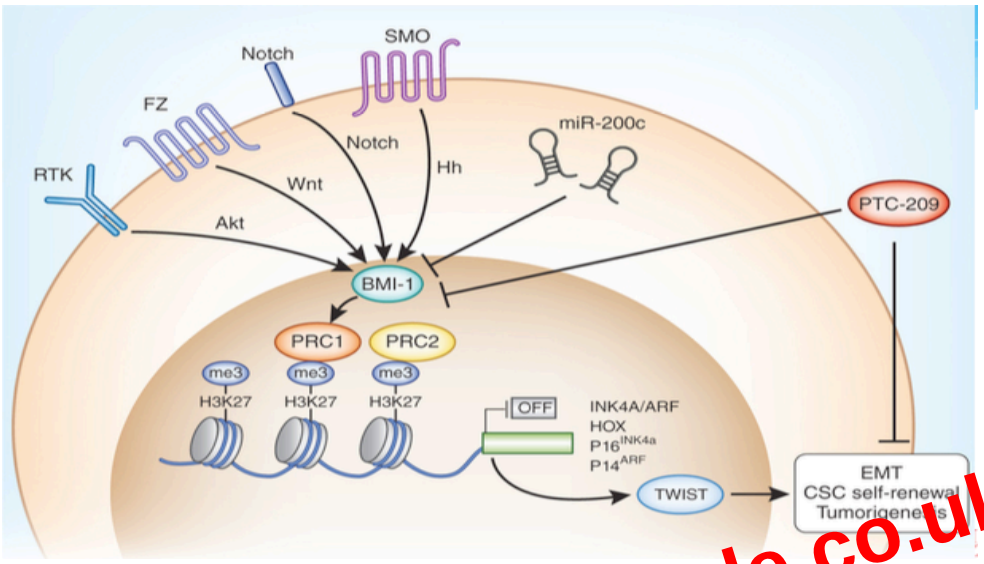
7. These CSC are resistant because:
   - They have a **low proliferative rate –** most conventional anti-neoplastic agents target rapidly dividing cells
   - Often **overexpress anti-apoptotic proteins** such as Bcl-2 and survivin that partly protect from apoptosis induction.
   - They often express high levels of proteins involved in the **efflux pumping mechanisms,** i.e. they actively pump out drugs called **drug transporters.**



8. In order to prevent the tumour from re-growing is to try and target the CSC itself, which requires the identification of phenotypic markers of tumour cells.
   - **BMI**-1, which is a component of the polycomb repressor proteins (PRC1), and these seem to be **overexpressed** in most CSCs, particularly in colon cancer stem cells.
   - There is a drug that targets BMI-1 – mice that are treated with the small molecule inhibitor (PTC-209) leads to some regression and significant degeneration of the tumours.
     - CIC frequency is also significantly reduced in mice that are treated with this small molecule inhibitor.
     - This is in contrast to patients treated with classical drugs such as chemotherapy that lead to an increase.

9. CSCs can identify patients with **differential prognosis:** if a patient has small CSCs, do they have a poorer prognosis?
   - For example, patients with **no ALDH1** (aldehyde dehydrogenase) **have a better survival** than those who are positive for this enzyme.
   - **α6-integrin negative** (expressed in breast cancer) did better than those that were positive.
     - Quantification of the stem cells within the tumour showed that the more CSCs related with a worse prognosis.