1. What is the forward ABO type? If that is correct, what anomaly must one explain?

_The forward type is AB, although the reactions of the patient’s RBCs with anti-B appear abnormal. If this is true one must explain why the patient’s plasma reacts with the group B reverse typing cell._

2. What is the reverse ABO type? If that is correct, what anomaly must one explain?

_The reverse ABO type is A. If this is true, one must explain why the reagent anti-B reacted with the patient’s RBCs._

3. Which of these hypotheses did the technologist investigate? What information in the type-and-screen results prompted him or her to do so?

_The technologist investigated hypothesis 2, looking for evidence of the acquired B phenomenon, which would explain why anti-B agglutinated some of the patient’s RBCs (note the mixed field reactions). Weak, mixed field reactions with the anti-B reagent in a group A person are typical of the acquired B phenomenon. Also, the history of chronic infection is consistent with the acquired B phenomenon. Colon cancer is classically associated with acquired B, but 30-40% of cases are NOT associated with GI diseases._

4. What is the serologic diagnosis?

_Acquired B phenomenon_

5. What is the biochemical explanation for the discrepancy?

_Acquired B is thought to be due to bacterial deacetylases which convert the group A immunodominant sugar N-acetylgalactosamine to galactosamine. This sugar is apparently similar enough to galactose, the B immunodominant sugar, that some clones of anti-B will react with it. Note that the altered RBCs react variably with anti-B of both monoclonal and human origin, and that reactions are decreased or eliminated by acidification, presumably because the amino group(-NH$_2$) of galactosamine is converted to NH$_3^+$. These findings are typical of acquired B._