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Poster #59

Use of Daratumumab and its repercussions in Transfusion Sciences

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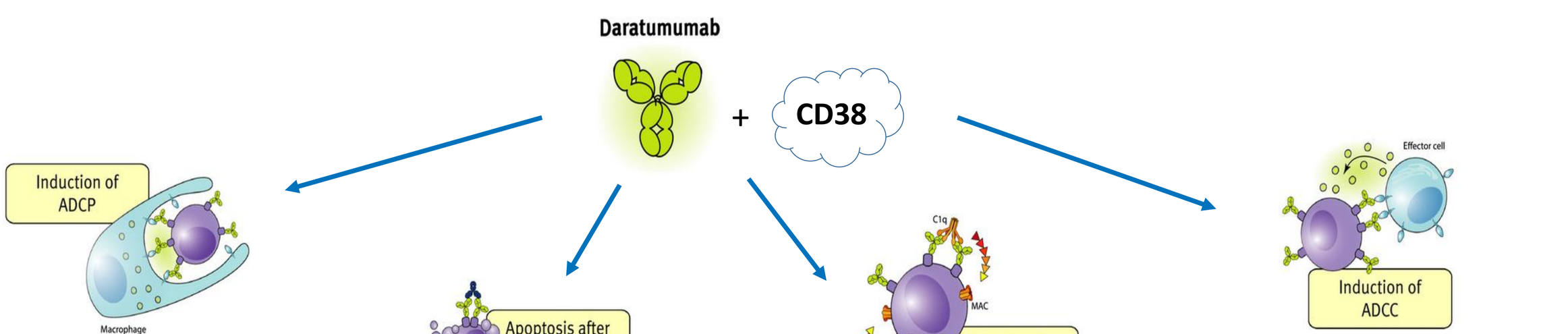
Introduction

Daratumumab (DARA) is an innovating therapy for Multiple Myeloma (MM). It´s an immunoglobulin G1 kappa (IgG1κ) monoclonal antibody with a killing spectrum that recognizes CD38 on myeloma cells which shows an over expression of this protein.
CD38 is a cell surface receptor with various functions, such as signaling, receptor-mediated adhesion and enzymatic activity.

Methods



Its Fc fragment is then bound by an FcR-bearing macrophage, inducing phagocytosis.

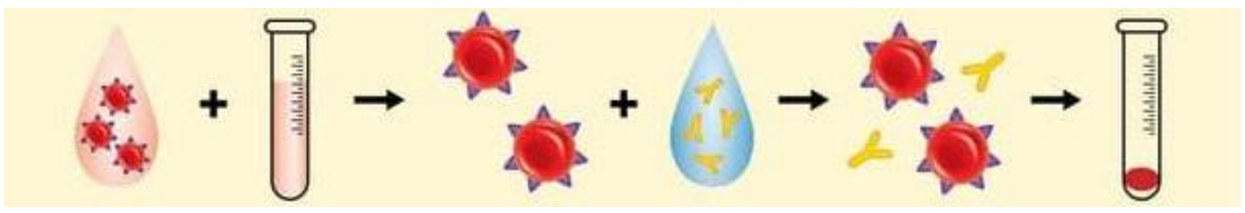
FcR-mediated crosslinking of daratumumab induces direct cellular apoptosis.

Its Fc fragment is bound by C1q, initiating complement cascade and resulting in a membrane attack complex.

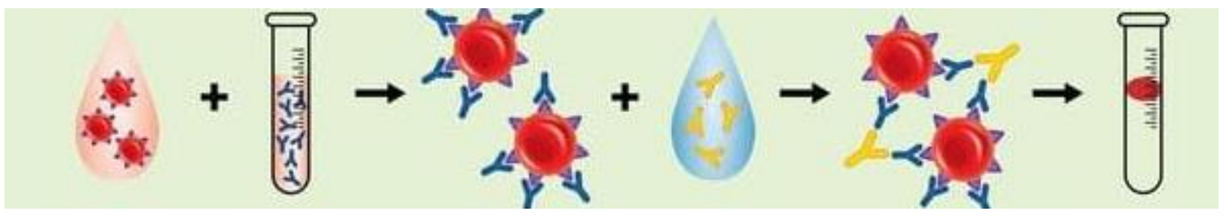
Its Fc fragment is then bound by an FcR-bearing effector cell, such as a natural killer cell, leading to activation of cytotoxic processes.

Repercussions

Like any other medication, DARA has advantages and disadvantages. DARA specifically targets the CD38 content of malignant cells. However, DARA can interfere in some transfusion medicine testing procedures, causing unnecessary delays in patient transfusions.
DARA has the capability to mask clinically significant antibodies



<u>Typical Negative Indirect Coombs Test:</u>
Red Blood Cells expressing antigens plus patient serum without antibodies led to no agglutination so the IAT is negative.



<u>Typical Positive Indirect Coombs Test:</u>
RBCs expressing antigens plus patient serum containing antibodies led to agglutination so the IAT is positive.

<u>Typical Indirect Coombs Test From Daratumumab Treated Patients:</u>
RBCs expressing CD38 with patient serum containing daratumumab. Daratumumab binds CD38 on RBCs so it is a false positive IAT.

Daratumumab + CD38 RBCs → False Positives → Dithiothreitol → Destroys Kell antigens → -Give packed RBCs -1% trypsin -Umbilical cord blood

Conclusion

These medications, like DARA, have the capability to change the way oncology patients are treated. However, these new treatments also have the potential to interfere with testing in blood banks. Delayed transfusion due to complications caused by DARA can pose a serious threat to patient safety. This threat can be avoided easily by giving the transfusion service appropriate diagnoses, such as phenotyping and genotyping, blood typing, and antibody screening should be performed before the initiation of DARA treatment.

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