

But why is the plasma green?

A blood bank quandary

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Introduction

- AABB standards require visual inspection of all blood products prior to release
- Visual inspection involves evaluating for clumping, gas bubbles, or discoloration
- These can be indications of poor product quality or microbial contamination
- Benign color changes do not mean that the blood product is unsuitable for transfusion
- Green color change is an example of a benign color change related to increased ceruloplasmin
- The green color change is often associated with pregnancy, oral contraceptive (OCP) use, or rheumatoid arthritis
- Figure 1 demonstrates ceruloplasmin synthesis (Tietz)

Case Report

- An altruistic donor successfully completed the donor health questionnaire (DHQ)
- The donor underwent 1 Whole Blood donation at Carter BloodCare
- A plasma unit was prepared from the donated blood
- The plasma unit was found to be green in coloration
- Subsequent infectious testing for the plasma unit was negative
- The blood product was distributed
- No follow-up information was available about the donor's medication history

Figure 1

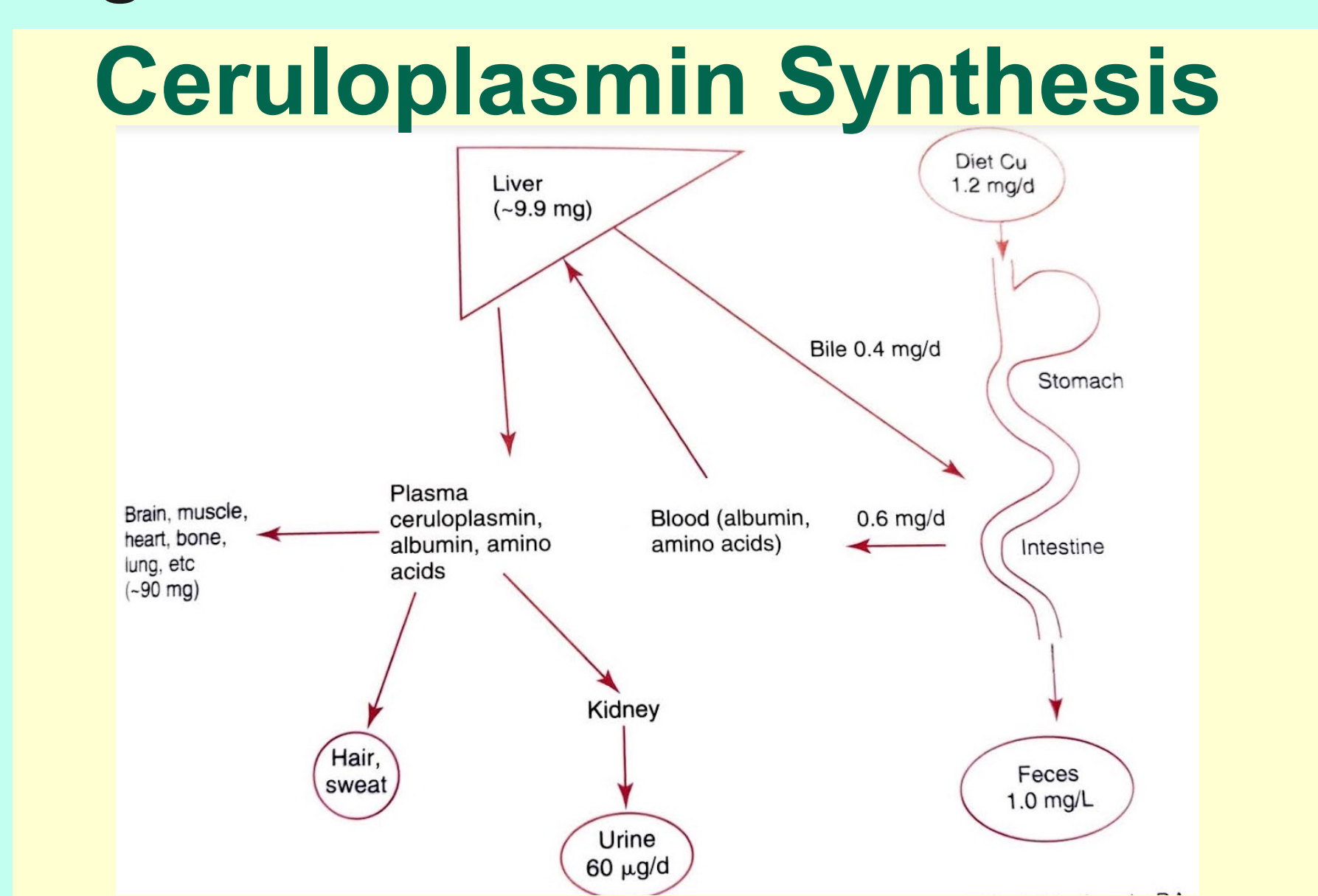


Figure 2



Figure 3



Results

- Carter BloodCare was contacted in March of 2023 regarding a report of green plasma
- The on-service transfusion medicine physician conducted an evaluation but was only able to find a historic example (figure 2)
- A review of the current Dallas Children's Medical Center blood supply showed 62 plasma blood products, none of which had green color
- A review of the available literature on MedLine from 1950-2023 using a query of "green plasma transfusion" yielded 164 results
- The first description of green donor plasma appeared in 1968
- A recent 2022 study comparing green plasma with normal donor plasma using thrombelastography (TEG) showed increased clotting parameters
- A recent tweet showed significant interest in green donor plasma despite the phenomenon being known for a long time (figure 3)
- It should be noted that levels of oral contraceptive pill (OCP) use have decreased in recent years

Discussion or Conclusion

- Green coloration is not a contraindication for plasma transfusion
- Bacterial contamination is a concern for blood services but it is fairly uncommon in plasma products as they are frozen
- Clumping or gas bubbles may help indicate contamination and should be ruled out prior to distribution
- Normally plasma color ranges from yellow to orange-red, depending on the presence or absence of red blood cells or hemolysis
- Ceruloplasmin is a blue copper-binding protein which can cause plasma to appear green
- Increases in ceruloplasmin can occur either as an acute phase reactant with chronic inflammation, such as in rheumatoid arthritis, or in pregnancy or oral contraceptive pill (OCP) use

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