Blood Products and Cell Therapies

Disclaimer

The views and opinions presented here represent those of the speaker and should not be considered to represent advice or guidance on behalf of the Food and Drug Administration or the Department of Health and Human Services.

Blood Products

- Scope
  - Will define substances in non-transfusion products derived from multiple donors
  - ISBT 128 covers the data standards for blood transfusion products
    - https://iccbba.org/tech-library/iccbba-documents/technical-specification
- All substances derived from human blood will be described as structurally diverse substances.
  - Restrict to just to human?
- Recombinant Blood Proteins will be described as proteins

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Blood Products

- The source organism of the structurally diverse substance will be captured as a defining element

  <PARENT_SUBSTANCE_ID>G0T704E6Z3
  <PARENT_SUBSTANCE_NAME>HOMO SAPIENS

- The part will also be captured
  - Blood or Blood Plasma could be the part
- The fraction will also be captured.
- Do we want to allow fractions of fractions or just capture the resulting fraction

Polyclonal Antibodies/ Fraction Problem

Single Fraction

- <PART>BLOOD PLASMA
- <MATERIAL_TYPE>IMMUNOGLOBULIN OR PROTEIN
- <MATERIAL_SUBTYPE> IgG?
- <FRACTION>IVIG

Multiple Fraction

- <PART>BLOOD
- <MATERIAL_TYPE>IMMUNOGLOBULIN
- <MATERIAL_SUBTYPE> IgG
- <FRACTION>PLASMA
- <FRACTION>CRYOPRECIPITATED PLASMA
- <FRACTION> COHN FRACTION II AND III….
- <FRACTION>IVIG

Polyclonal Immunoglobulins

Single Fraction

- <PART>BLOOD PLASMA
- <MATERIAL_TYPE>IMMUNOGLOBULIN
- <MATERIAL_SUBTYPE> IgG
- <FRACTION>IVIG

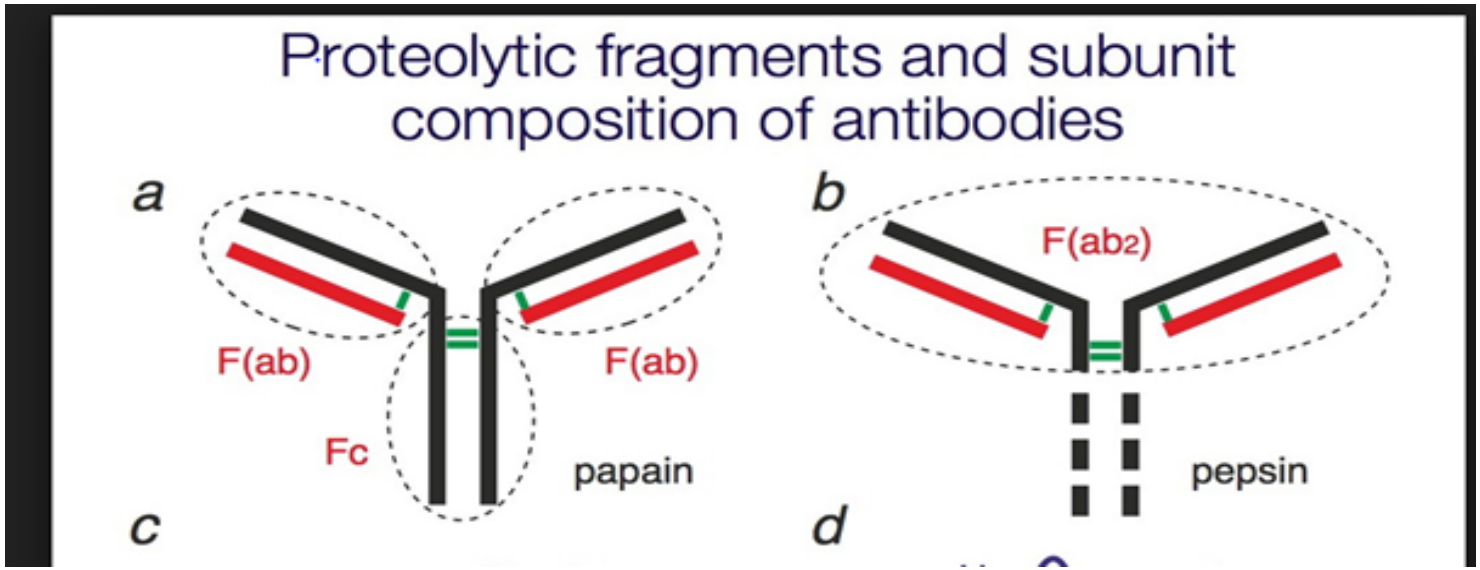
Multiple Fraction

- <PART>BLOOD
- <MATERIAL_TYPE>IMMUNOGLOBULIN
- <MATERIAL_SUBTYPE> IgG
- <FRACTION>PLASMA
- <FRACTION>CRYO-DEFICIENT PLASMA
- <FRACTION> COHN FRACTION II AND III….
- <FRACTION>IVIG

Targeted Polyclonal Antibodies

- The target is captured as an agent modification regardless whether it the result of an intentional immunization or exposure to the antigen
  - <AGENT_MODIFICATION_TYPE>IMMUNOLOGICAL
  - <ROLE>TARGETED ANTIGEN
  - <MODIFICATION_AGENT_ID>16YYC73841
  - <MODIFICATION_AGENT>BLOOD GROUP RH(D) POLYPEPTIDE

Polyclonal FAB and FAB2



Polyclonal FAB and FAB2

- The treatment is captured as an agent modification with the protease as the modification agent
  - <AGENT_MODIFICATION_TYPE>ENZYMATIC
  - <ROLE>FAB GENERATION
  - <MODIFICATION_AGENT_ID>A236A06Y32
  - <MODIFICATION_AGENT>PAPAIN

Polyvalent Immunosera

- Four ways to handle it.
- A single substance with multiple modifications
- A mixture of monovalent polyclonal antibodies
- A group 1 specified substance
- A product with multiple substances
- It may depend on the product

Polyvalent Immunosera

- A single substance with multiple modification agents
  - BabyBIG, Botulism Immune Globulin Intravenous (Human) (BIG-IV), is a solvent-detergent-treated, sterile, lyophilized powder of immunoglobulin G (IgG),stabilized with 5% sucrose and 1% albumin (human). It contains no preservative. The purified immunoglobulin is derived **from pooled adult plasma from persons who were immunized with pentavalent botulinum toxoid** and selected for their high titers of neutralizing antibody against botulinum neurotoxins type A and B. All donors were testedand their sera found to be negative for antibodies against the human immunodeficiencyvirus and the hepatitis B and hepatitis C viruses.

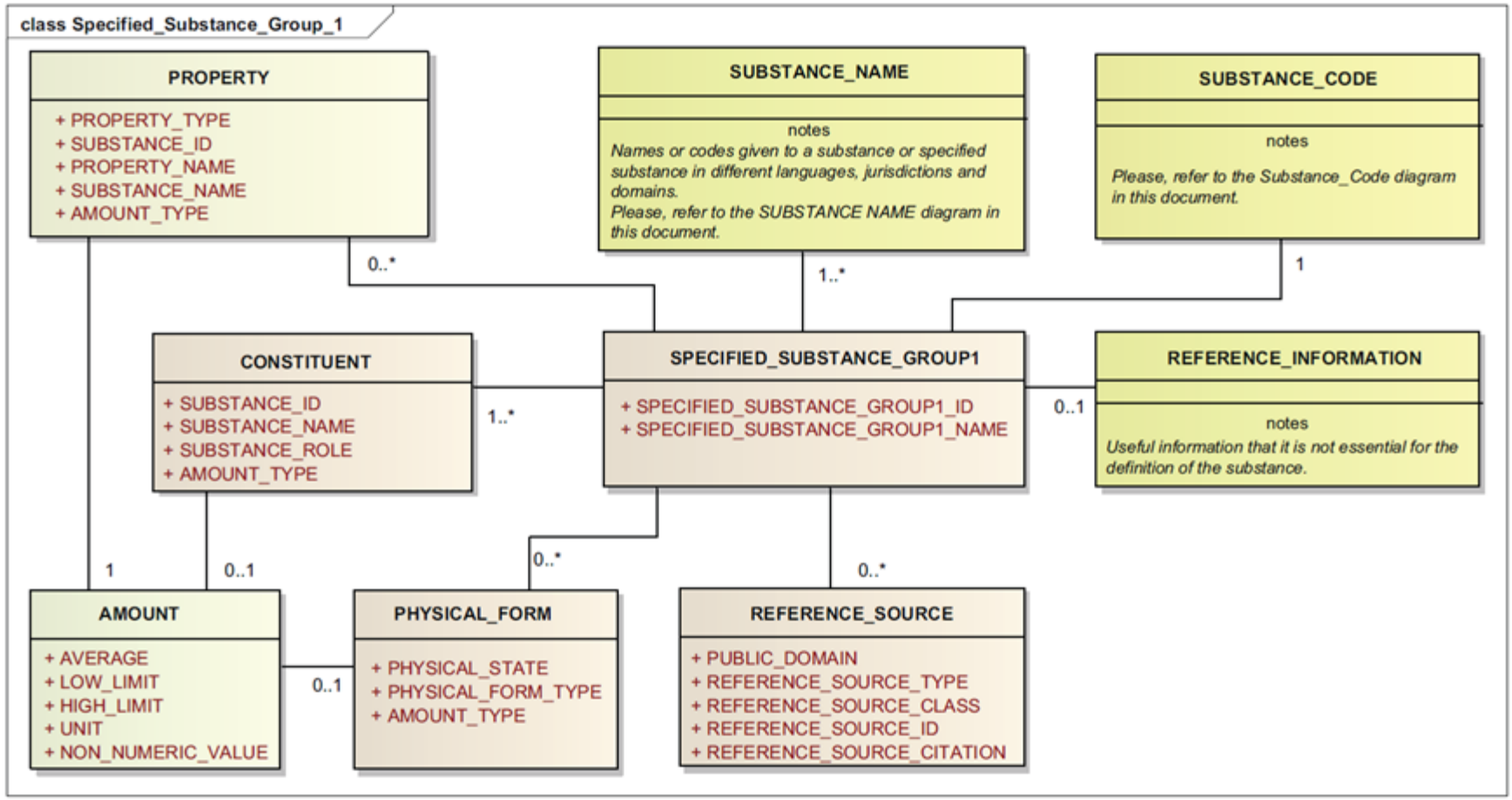
Polyvalent Immunosera

- A mixture with multiple single substances
  - Viper venom antiserum, European
  - From Ph. Eur.
  - DEFINITION
  - European viper venom antiserum is a preparation containing antitoxic globulins that have the power of neutralising the venom of one or more species of viper. The globulins are obtained by fractionation of the serum of animals that have been immunised against the venom or venoms.
  - IDENTIFICATION
  - It neutralises the venom of Vipera ammodytes, or Vipera aspis, or Vipera berus, or Vipera ursinii or the mixture of these venoms stated on the label, rendering them harmless to susceptible animals.
  - Typically immunize each individual animal with a single antigen, pool according to titer and then isolated IgG

Polyvalent Immunosera

- A product with multiple substances
  - Gas-gangrene antitoxin, mixed (Ph. Eur.)
  - DEFINITION
  - Mixed gas-gangrene antitoxin is prepared by mixing gas-gangrene antitoxin (novyi), gas-gangrene antitoxin (perfringens) and gas-gangrene antitoxin (septicum) in appropriate quantities.
  - IDENTIFICATION
  - It specifically neutralises the alpha toxins formed by Clostridium novyi (former nomenclature: Clostridium oedematiens), Clostridium perfringens and Clostridium septicum, rendering them harmless to susceptible animals.

Group 1 Specified Substances



Polyvalent Immunosera Group 1

- Elements in Red would be captured at group one specified substance
- BabyBIG, Botulism Immune Globulin Intravenous (Human) (BIG-IV), is a solvent-detergent-treated, sterile, lyophilized powder of immunoglobulin G (IgG),stabilized with 5% sucrose and 1% albumin (human). It contains no preservative. The purified immunoglobulin is derived from pooled adult plasma from persons who were immunized with pentavalent botulinum toxoid and selected for their high titers of neutralizing antibody against botulinum neurotoxins type A and B. All donors were tested and their sera found to be negative for antibodies against the human immunodeficiencyvirus and the hepatitis B and hepatitis C viruses

Other Blood Products/Fraction Problem

- Human Serum Albumin

Single Fraction

- <PART>BLOOD PLASMA
- <MATERIAL_TYPE>GLOBULIN OR PROTEIN
- <FRACTION>ALBUMIN

Multiple Fraction

- <PART>BLOOD
- <MATERIAL_TYPE>GLOBULIN
- <MATERIAL_SUBTYPE> IgG
- <FRACTION>PLASMA
- <FRACTION>CRYOPOOR PLASMA
- <FRACTION> COHN FRACTION V
- <FRACTION>ALBUMIN

Cell Therapy

- Source
  - Autologous
  - Allogenic
- Any differentiation factor captured
  - GM-CSF (agent)
  - G-CSF
  - Gene Transduction
    - Gene (agent) consist of Gene elements (enhancer, promoter, silencer)
    - Expressed Protein (Structural Modification)
- Culture
  - Media should be not part of substance definition
    - Group 1 specified substance
  - Time could be captured

Cell Therapy Examples

- Carticel, Chondroselect, Maci (Cell Component)
- AUTOLOGOUS CULTURED CHONDROCYTES
- Source Material
  - <SOURCE_MATERIAL_CLASS>ORGANISM
  - <SOURCE_MATERIAL_TYPE>AUTOLOGOUS
  - <SOURCE_MATERIAL_STATE>LIVE
  - <PARENT_SUBSTANCE_ID>G0T704E6Z3
  - <PARENT_SUBSTANCE_NAME>HOMO SAPIENS
- Part and Fraction
  - <PART_GROUP>
  - <PART>KNEE CARTILAGE OR <PART>CARTILAGE
    <PART_LOCATION>KNEE
  - <MATERIAL_TYPE>CELL
  - <FRACTION>CHRONDROCYTES

Cell Therapy Examples

- Provenge
- SIPULEUCEL-T
- Source Material
  - <SOURCE_MATERIAL_CLASS>ORGANISM
  - <SOURCE_MATERIAL_TYPE>AUTOLOGOUS
  - <SOURCE_MATERIAL_STATE>LIVE
  - <PARENT_SUBSTANCE_ID>G0T704E6Z3
  - <PARENT_SUBSTANCE_NAME>HOMO SAPIENS
- Part and Fraction
  - <PART_GROUP>
  - <PART>BLOOD
  - <MATERIAL_TYPE>CELL
  - <FRACTION>PERIPHERAL BLOOD MONONUCLEAR

Cell Therapy Examples

- SIPULEUCEL-T (CONT)
- <MODIFICATION_GROUP>
  - <MODIFICATION_TYPE>AGENT
  - <AGENT_MODIFICATION_TYPE>BIOLOGICAL/ IMMUNOLOGICAL
  - <ROLE>ANTIGEN PRESENTATION
  - <MODIFICATION_AGENT_ID>N5E5Q8249O
  - <MODIFICATION_AGENT>PROSTATIC ACID PHOSPHATASE (PAP)-GRANULOCYTE-MACROPHAGE COLONY-STIMULATING FACTOR (GM-CSF) FUSION PROTEIN</ MODIFICATION_AGENT>