Risks related to handling of protein biological drugs in real life

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Designed to be safe

The drugs that you handle in everyday life are designed to be safe, but you should treat them according to instructions.

Stability testing

- Stability testing is done for all products
- The principles are described in regulatory guidelines
- The products are tested at several different storage conditions
- Biologics shelf-life from real-time real-storage conditions
- One normally also test
  - Photostability
  - Freeze-thaw stability

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Follow instructions

All biologics are not the same

That’s why it is important to follow the instructions given for each drug

Read the leaflets

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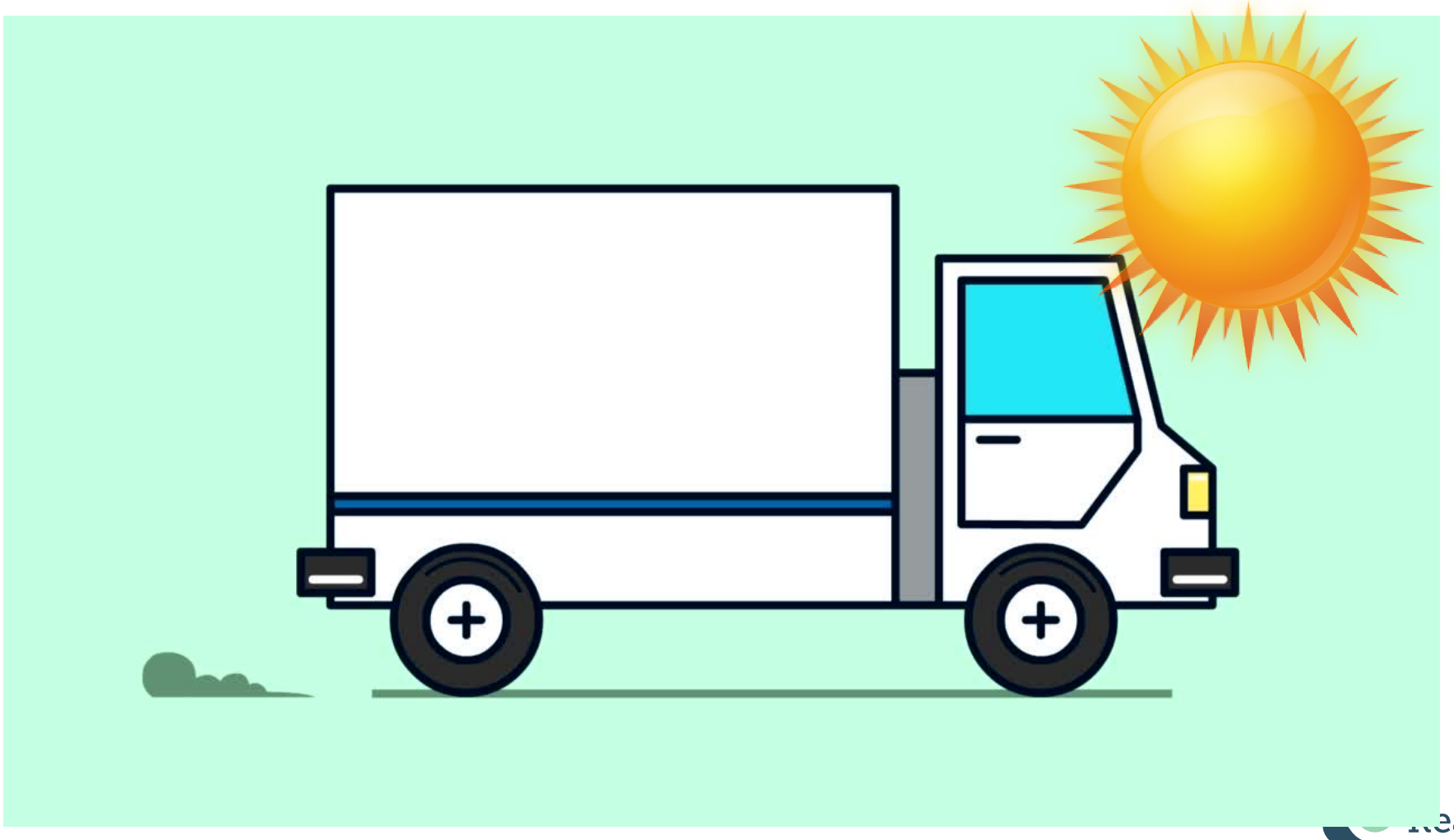
To find information on EMA

https://www.ema.europa.eu

Be especially careful when..

When we transport…



Transport with care

During transport avoid:

- The drug product being exposed to the wrong temperatures
- Too much shaking, vibrations and chock
- Dropping
- Do not use transport systems like pneumatic tubing or other systems that induce stress on the product without ensuring that product quality is not impacted

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Adhere to GDP

Good distribution practice (GDP) describes the minimum standards to be met to ensure that the quality and integrity of medicines are maintained throughout the supply chain.

Compliance with GDP ensures that:

- medicines in the supply chain are authorised in accordance with legislation;
- medicines are stored in the right conditions at all times, including during transportation;
- contamination by or of other products is avoided;
- an adequate turnover of stored medicines takes place;
- the right products reach the right addressee within a satisfactory time period.

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GDP and storage

- The premises should be designed or adapted to ensure that the required storage conditions are maintained
- Medicinal products and, if necessary, healthcare products should be stored separately from other products likely to alter them and should be protected from the harmful effects of light, temperature, moisture and other external factors.
- Medicinal products should be stored in segregated areas which are clearly marked and have access restricted to authorised personnel
- Medicinal products should be handled and stored in such a manner as to prevent spillage, breakage, contamination and mix-ups
- Warehousing operations must ensure appropriate storage conditions are maintained and allow for appropriate security of stocks
- Stock should be rotated according to the ‘first expiry, first out’ and medicinal products that are nearing their expiry date/shelf life should be withdrawn

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GDP and transport

- It is the responsibility of the supplying wholesale distributor to protect medicinal products against breakage, adulteration and theft, and to ensure that temperature conditions are maintained within acceptable limits during transport.
- Regardless of the mode of transport, it should be possible to demonstrate that the medicines have not been exposed to conditions that may compromise their quality and integrity. A risk-based approach should be utilised when planning transportation
- The required storage conditions for medicinal products should be maintained during transportation within the defined limits as described by the manufacturers or on the outer packaging
- There should be written procedures in place for the operation and maintenance of all vehicles and equipment involved in the distribution process, including cleaning and safety precautions.
- Risk assessment of delivery routes should be used to determine where temperature controls are required.

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Evaluate transport effects on product

- The pharmaceutical companies must do transport validation
  - Validation process design
  - Qualification
  - Continues monitoring
- To prepare conduct
  - drop test
  - Shock and vibration tests
  - Photostability
  - temperature and humidity

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… Store

Store safe

- At the right temperature
- At the right humidity
- Protected from light
- If possible in its secondary package
- Away from products that can harm the product
- In ways that reduce risk for mix-ups

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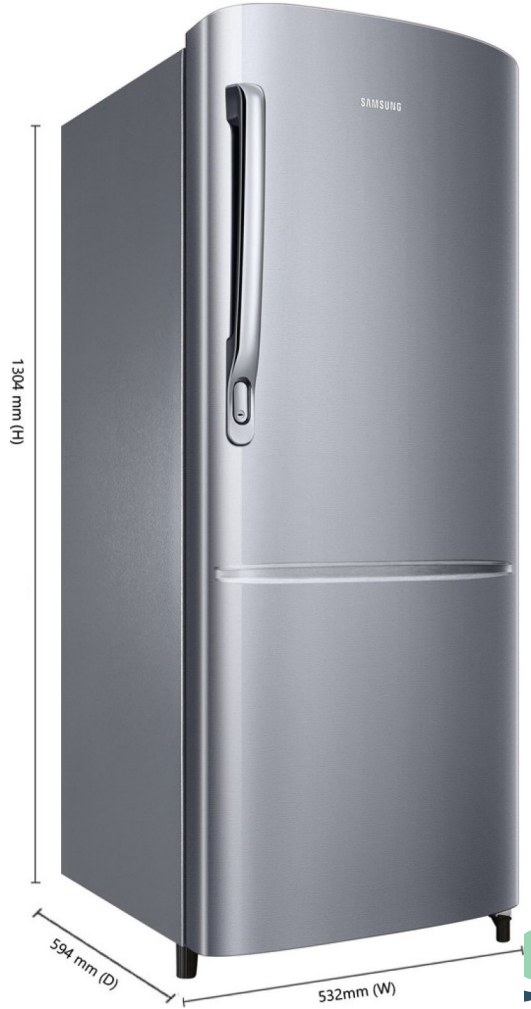
Cold storage

- Most biologics should be stored cold.
- Be aware that many biologics cannot be frozen and thawed so should be kept away from the cooling elements in the fridge



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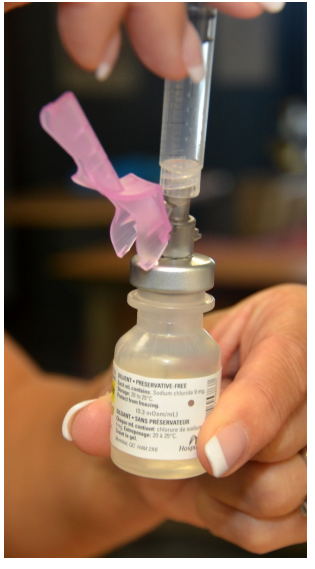
…. and prepare ….



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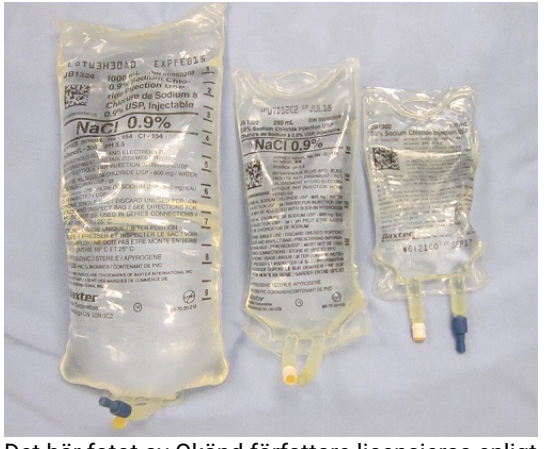

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Critical mistakes to avoid during preparations

- Mix-ups
  - Preparing the wrong drug
  - Use of the wrong diluent
  - Mixing the wrong concentration
- Follow safety procedures such as working aseptically
- Mix in a mild manner
- Using materials that are compatible with the product

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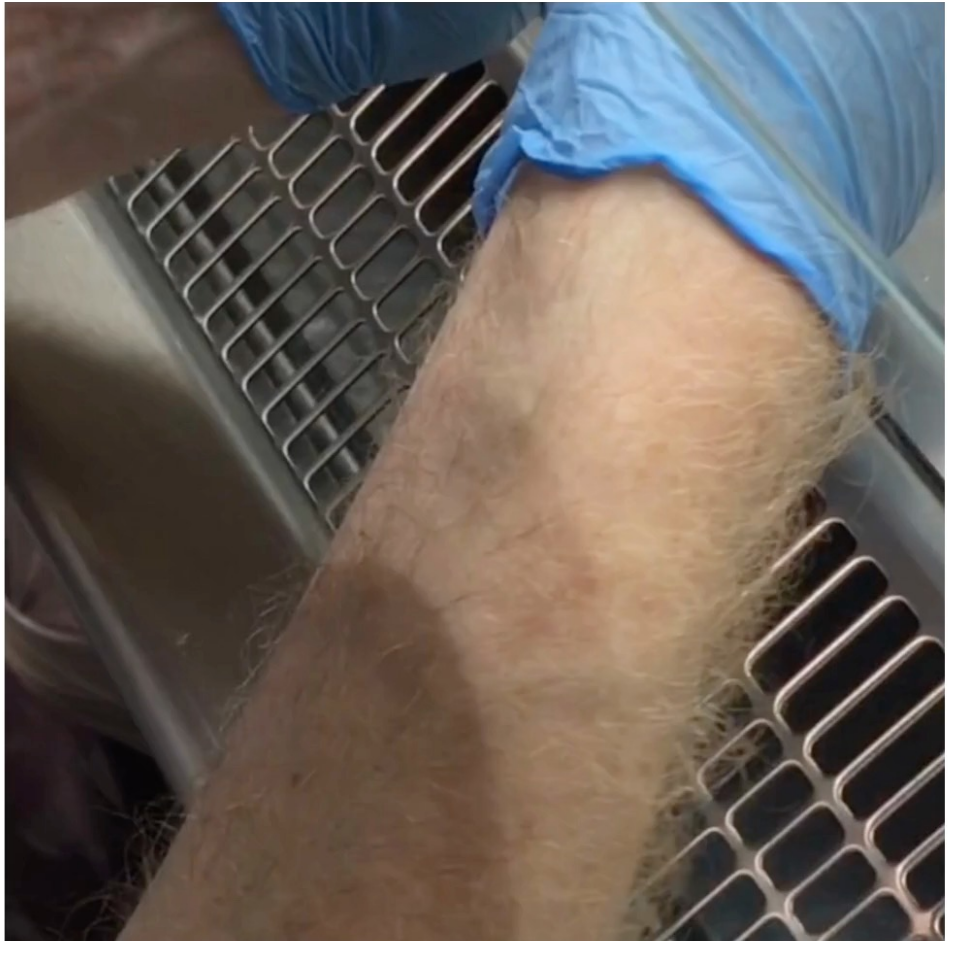
Mixing biologics

The wrong mixing technique can lead to aggregates

Avoid

- Shaking
- Flicking
- Dropping



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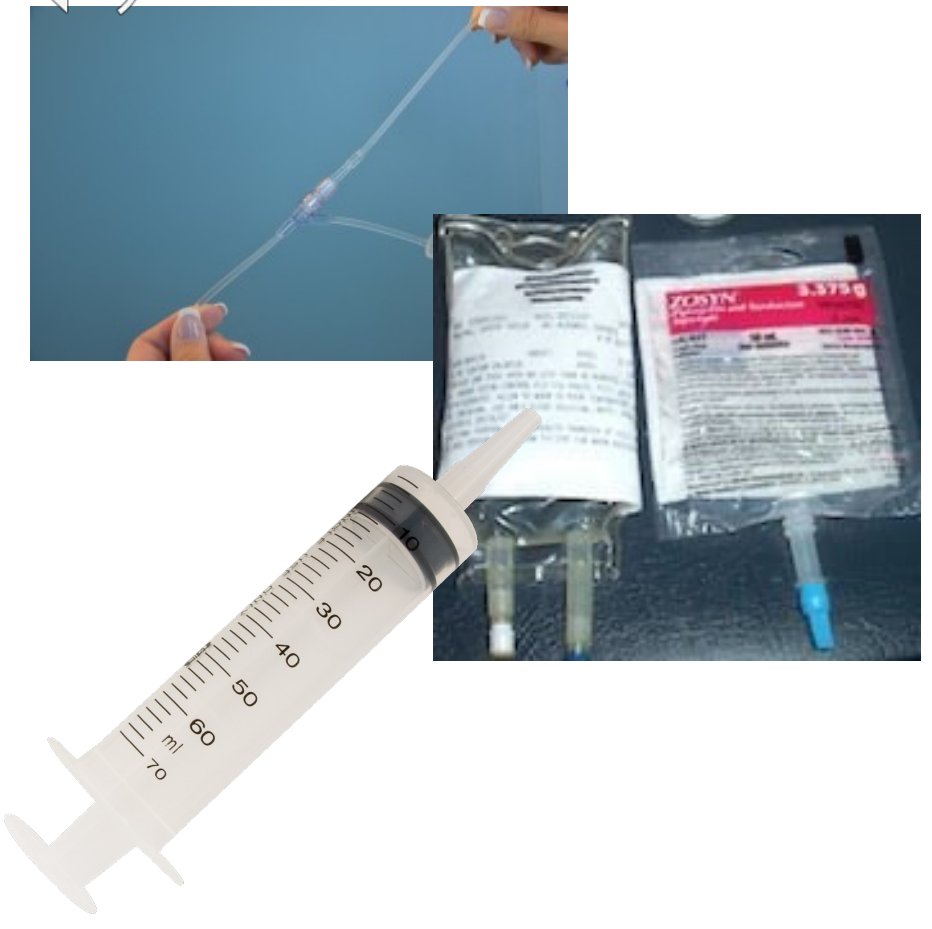

Material and devices used for preparation

Proteins might be sensitive to different materials.

- Risk of aggregates, loss of substance etc when introducing new types of materials
  - syringes, tubing, or IV-bags
  - spikes and CSTDs

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Closed system transfer devices

Benefits with CSTDs

- Protect healthcare workers
- Some extent of improved aseptic handeling

Risks related to CSTDS

- Aggregation and particle formation
- Reduction of the dose
- Protein adsorption

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… and uses biological drugs

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Infusion

- Biologics can be incompatible with some diluents and other drug products
- If possible, avoid the mixing of biological drugs with other drugs within the same infusion line
- Avoid direct sunlight when administering
- Be careful when it comes to compatibility with inline filters