Platform and Prescription Platform Biologics

Dr. Amy Gill

Senior Staff Veterinarian
USDA APHIS VS STAS
Center for Veterinary Biologics - PEL
1920 Dayton Ave.
Ames, Iowa USA 50010
515-337-6100
Email: amy.f.gill@aphis.usda.gov

Guidance for New Technology

- **VS Memorandum No. 800.213**, Licensing Guidelines for Production Platform-Based, Non-Replicating, Nonviable Products (2018)
- **VS Memorandum No. 800.214**, Prescription Platform Product Biologics (2018)

What is the Goal

- CVB recognizes the need and desire to get new or updated products to the market **faster**
- Platform/Recombinant technologies allow for a **standardized manufacturing** process
- Platform and Prescription products rely on this standardization to provide **increased flexibilities**
- These products are related but different…

What is a Platform Product

- In general a Platform Product is defined by all of the following components:
  - Initial Product
  - Vector or Expression System (VES)
  - Gene (antigen) of Interest (GOI)
  - Manufacturing Process
  - Efficacy/Safety

What is a Platform Product

- In general Platform Product is defined by and includes all of the following components:

- **Initial Product**
- Vector or Expression System (VES)
- Gene (antigen) of Interest (GOI)
- Manufacturing Process
- Efficacy/Safety

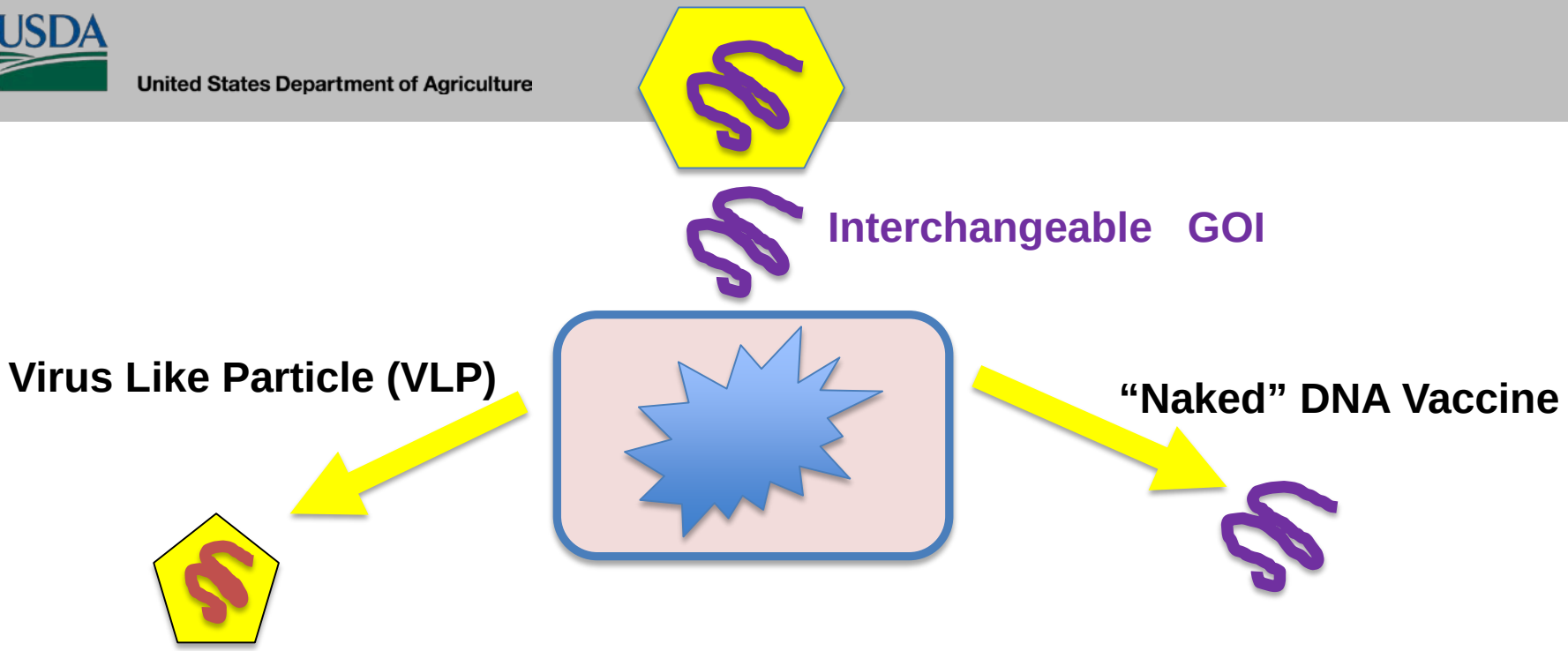
- A fully-licensed product that "establishes" the platform
- All subsequent permissible variants are based on the initial product
- Other than a GOI variant, other deviations from the initial product will require new licensure

What is a Platform Product

- In general Platform Product is defined by and includes all of the following components:

  - Initial Product
  - **Vector or Expression System (VES)**
  - Gene (antigen) of Interest (GOI)
  - Manufacturing Process
  - Efficacy/Safety

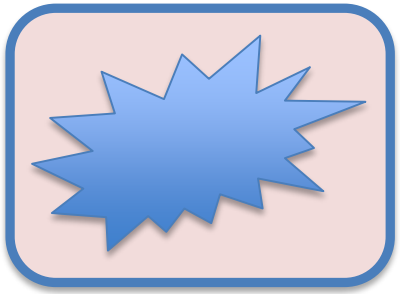
  - System used to express the GOI *in vivo (Vector)* or *in vitro (Expression System)*
  - Non-replicating and nonviable
  - Includes all reagents, seeds, sequences and cells to propagate the final construct



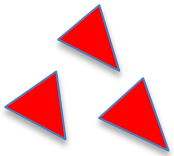
VECTOR = *in vivo* expression of the antigen.

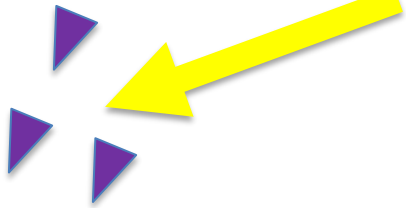
Antigen formed *within* the host "infected" cell.

Interchangeable GOI



GTT





<u>Synthetic Protein Peptide</u>:
Amino acids of epitope or antigenic determinant

Protein Sub-Unit
Polysaccharide
Conjugated Polysaccharide

Inactivated Recombinant Vaccine

EXPRESSION SYSTEM = *in vitro* expression of antigen. The *recombinant or transfected cell* produces the antigen.

What is a Platform Product

- In general Platform Product is defined by and includes all of the following components:

  - Initial Product
  - Vector or Expression System (VES)
  - **Gene (antigen) of Interest (GOI)**
  - Manufacturing Process
  - Efficacy/Safety

  - Referred to as gene, but think about in terms of antigen
  - One, partial or multiple genes
  - GOI variants, different sequence but same protein
  - Currently limited to antigens, does not include other products such as cytokines

What is a Platform Product

- In general Platform Product is defined by and includes all of the following components:

- Initial Product
- Vector or Expression System (VES)
- Gene (antigen) of Interest (GOI)
- **Manufacturing Process**
- Efficacy/Safety

- Standardized system for consistency in manufacture and formulation
- Subject to the same testing requirements as a traditional product
- Defined process for swapping the GOI

What is a Platform Product

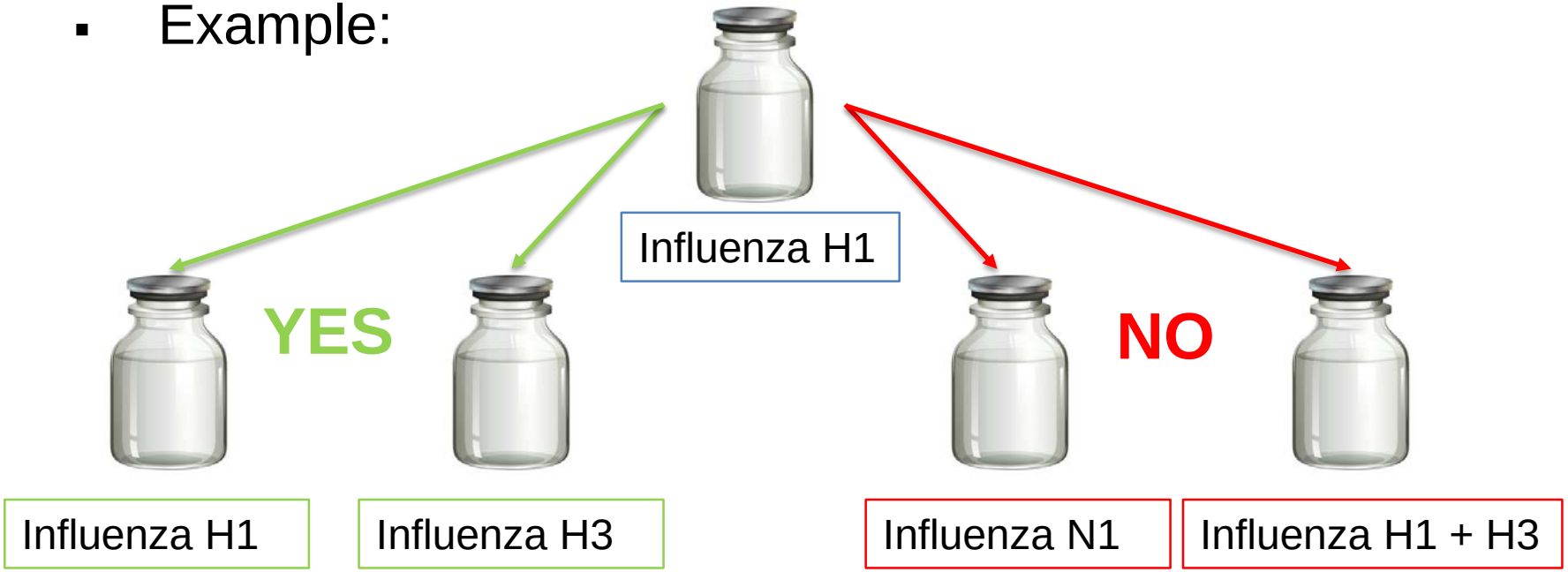
- In general Platform Product is defined by and includes all of the following components:

  - Initial Product
  - Vector or Expression System (VES)
  - Gene (antigen) of Interest (GOI)
  - Manufacturing Process
  - **Efficacy/Safety**

  - Establishes:
    - Target species
    - Minimum age
    - Dose volume
    - Route of administration
    - Minimum antigenic dose (efficacy)
    - Maximum antigenic content (safety)

Platform Product

- Once the initial product is licensed
  - The platform is considered “established”
  - No changes can occur except a variant of the GOI
  - A variant of the same GOI can be swapped for the original GOI and licensed with reduced requirements
  - Example:



Platform Product

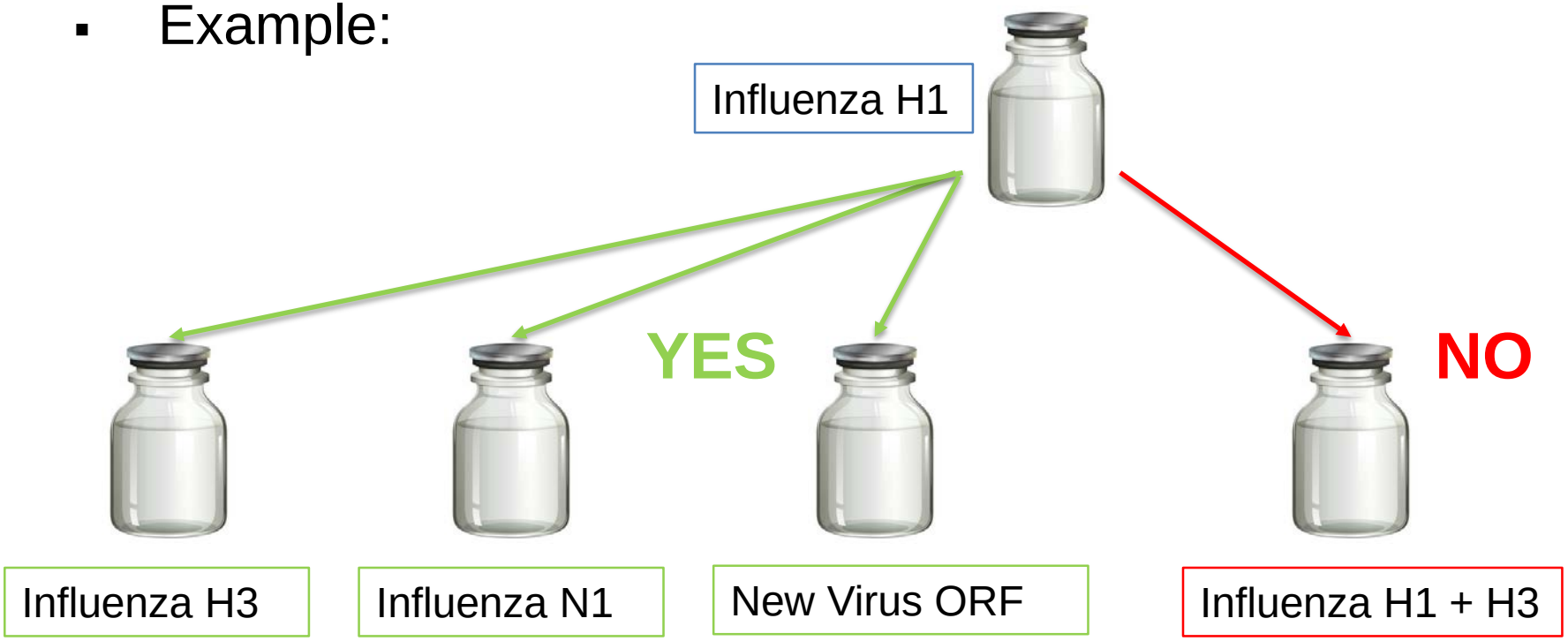
- After initial product, reduced minimum requirements to license subsequent GOI variants
  - Evidence of field relevance/need
  - Reasonable expectation of efficacy (e.g. serology)
  - New Category IV SIF with the new sequence
  - CVB confirmatory testing of Master Seed or Master Sequence
- Generally not needed (may vary)
  - Full efficacy (required for full license, not conditional)
  - Reevaluation for compliance with NEPA
  - Inactivation kinetics study
  - Field safety trial

Prescription Platform Product

- Custom veterinary biological product prepared for an individual animal or animals under a prescription written by a licensed veterinarian.
- Tested for safety and purity, but no efficacy claims
- Based on initial product fully licensed as described for a Platform Product
  - The platform is considered “established”
  - Again, no changes can occur except the inserted GOI, but not limited to just GOI variants…

Prescription Platform Product

- Based on a fully licensed Platform Product
  - Different GOI can be swapped for the original GOI
  - Limited to species, age, dose, route and maximum antigenic content established in licensed initial product
  - Example:



Platform vs Prescription

	Platform	Prescription
Product must be non-replicating/nonviable	**Yes**	**Yes**
Requires full licensure of initial product	**Yes**	**Yes**
Limited to initial manufacturing process, maximum antigenic content, species for use, age, dose, route	**Yes**	**Yes**
Limited to initial gene/pathogen and variants	**Yes**	**No**
Must support GOI changes with field relevance, safety aspects, restricted organisms	**Yes**	**Yes**
Restricted use under a veterinary prescription	**No**	**Yes**
Can label and market efficacy claims	**Yes**	**No**
Restricted organisms require authorization	**Yes**	**Yes**

Questions