

Module 2: Types of meningococcal vaccine

This eModule is designed to give you an overview of the types of vaccine that are available to help protect against invasive meningococcal disease (IMD).

This eModule is provided to you by Pfizer Ltd. It is not intended to replace your guidelines, protocols and SOPs.

For UK registered healthcare professionals and other relevant decision makers*

References can be found via the buttons on every screen throughout the course, prescribing information and adverse event reporting can be found via buttons on the summary screen.

For full information on Nimenrix, please refer to the Summary of Product Characteristics.

*The ABPI Code of Practice definition of "other relevant decision makers" particularly includes those with an NHS role who could influence in any way the administration, consumption, prescription, purchase, recommendation, sale, supply or use of any medicine but who are not healthcare professionals

Module introduction and learning objectives

Introduction:

There are a number of different meningococcal vaccines available to help protect against most of the *N. meningitidis* serogroups that commonly cause invasive meningococcal disease (IMD). This second module will give you an overview of the different types of meningococcal vaccine.

Learning objectives:

By the end of this Module, you should be able to:



Explain why a number of different meningococcal vaccines have been developed



N. meningitidis

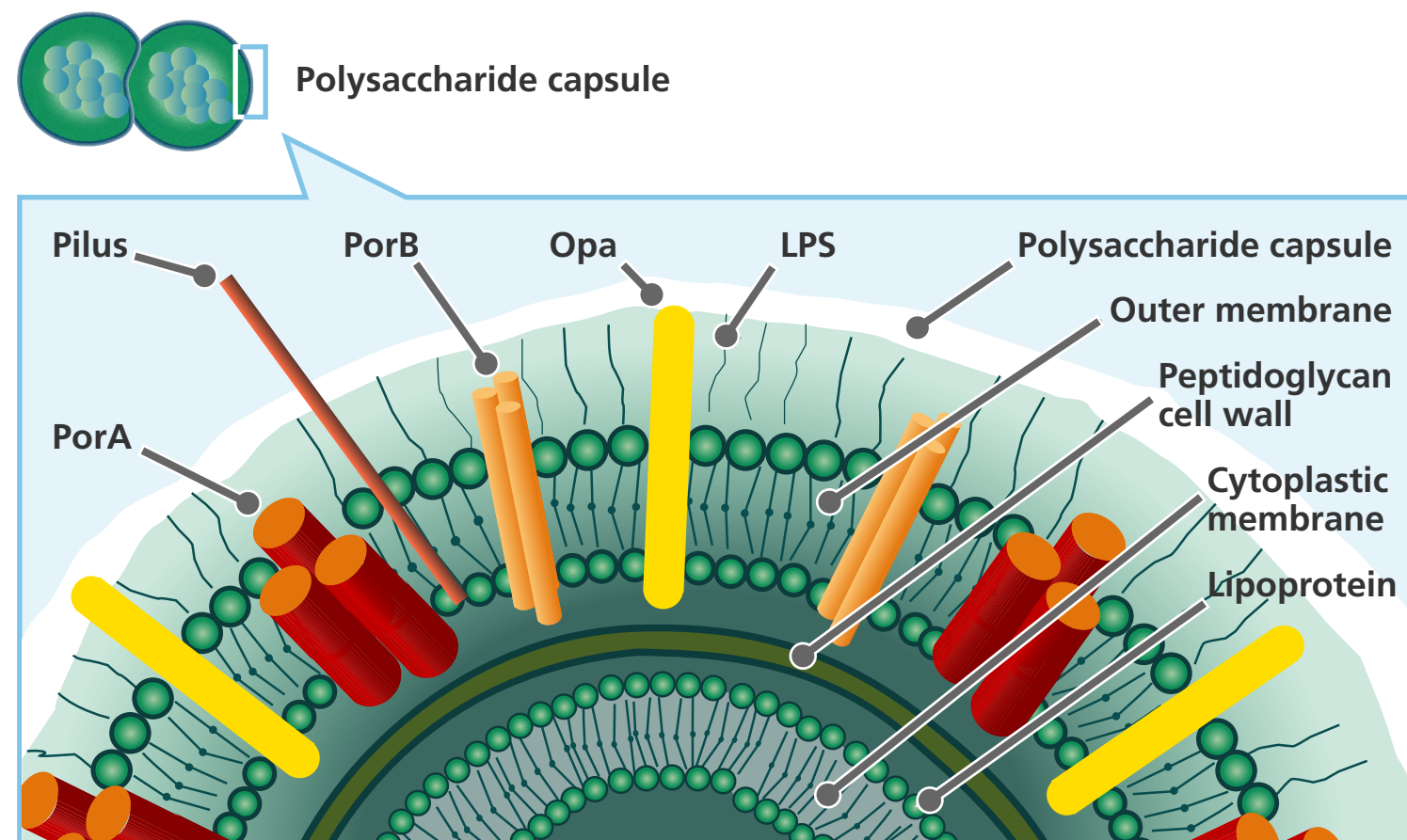
In Module 1 you learned that:

- *N. meningitidis* bacteria are classified into serogroups according to differences in their polysaccharide capsules¹
- Six *N. meningitidis* serogroups cause most cases of invasive meningococcal disease (IMD), A, B, C, W-135, X and Y.²

Different meningococcal vaccines are available to help protect against most of the *N. meningitidis* serogroups that commonly cause IMD. Most vaccines help to prevent infection by inducing an immune response against specific capsular polysaccharides found in these serogroups. This approach has led to the development of vaccines against serogroups A, C, W-135 and Y.³

Cross-sectional view of the *N. meningitidis* bacterium, showing the polysaccharide capsule and other cell surface components.

Adapted from Stephens *et al.*²



LPS, lipopolysaccharide; Opa, opacity-associated protein; PorA, porin A; PorB, porin B.

Cell surface antigens (cell markers) are unique components (e.g., proteins, carbohydrates) present on the cell surface that can be used to help identify or classify cells. These cell surface antigens can also be targets for vaccines.⁴

Types of meningococcal vaccine

There are a number of different types of meningococcal vaccines available that target most of the *N. meningitidis* serogroups that commonly cause IMD, including serogroups A, B, C, W-135 and Y.^{1,2}

The table below summarises the types of meningococcal vaccine that are based on capsular polysaccharides:³⁻¹³

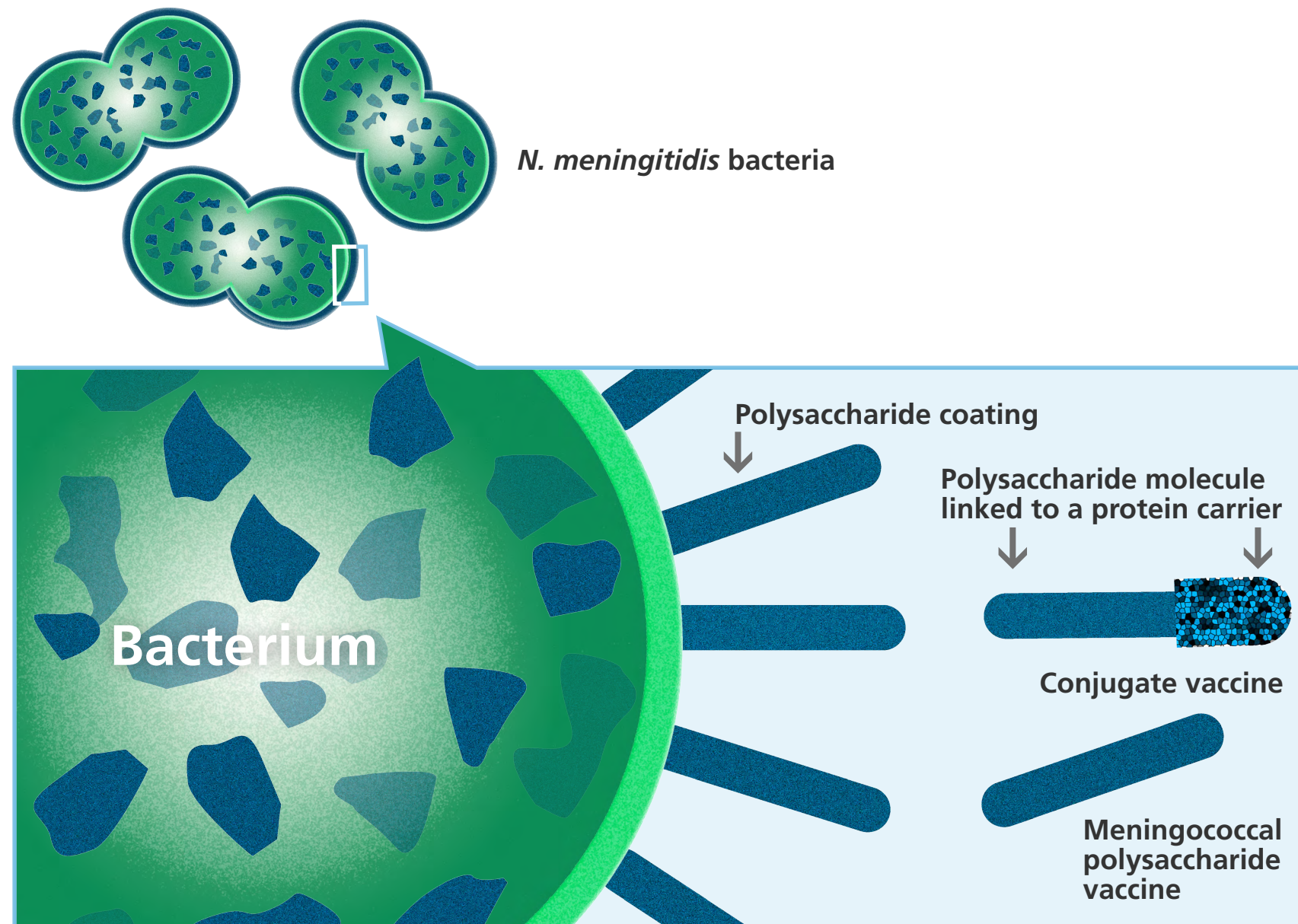
Polysaccharide vaccines	Conjugate vaccines
<ul style="list-style-type: none"> • Manufactured using a piece of the polysaccharide capsule that surrounds the <i>N. meningitidis</i> bacterium³ • Poorly immunogenic in children less than 2 years old^{4,5} • Less effective antigen, which results in a lower immune response⁵ • Polysaccharide vaccines are no longer available in the United Kingdom⁶ 	<ul style="list-style-type: none"> • Manufactured by joining a piece of the polysaccharide capsule that surrounds the <i>N. meningitidis</i> bacterium to a protein carrier^{5,7,8} • Immunogenic in infants and children less than 2 years old⁹ • Capable of eliciting long-term immunologic memory¹⁰ • Examples of conjugate vaccines that have been developed are: <ul style="list-style-type: none"> – Monovalent vaccines against serogroups C and A¹¹ – Combination vaccines against serogroup C (Hib/MenC)¹² – Multivalent vaccines against serogroups A, C, W-135 and Y^{9,13}

Protein-based meningococcal vaccines that target *N. meningitidis* serogroup B are also available.¹³

Protein-based vaccines are composed of specific isolated proteins of *N. meningitidis* manufactured using recombinant DNA technology.^{14,15}

Types of meningococcal vaccine

Polysaccharide and conjugate meningococcal vaccines¹



Check your understanding



True or false:

Meningococcal polysaccharide vaccines are immunogenic in infants?^{1,2}



Select the correct answer:

What is not one of 3 main types of meningococcal vaccine?^{2,3-6}

Module summary

✓ Different vaccines are available to help protect against most of the *N. meningitidis* serogroups that commonly cause IMD, including serogroups A, B, C, W-135 and Y. Most vaccines help to prevent infection by inducing an immune response against specific capsular polysaccharides found in these serogroups. This approach has led to the development of vaccines against serogroups A, C, W-135 and Y but has not been successful for serogroup B.^{1,2}

✓ The three types of meningococcal vaccine are:

- **Polysaccharide vaccines:**³⁻⁶

- Manufactured using a piece of the polysaccharide capsule
- Poorly immunogenic in children less than 2 years old
- Less effective at eliciting long-term immunologic memory
- Polysaccharide vaccines are no longer available in the United Kingdom

- **Conjugate vaccines:**^{5,7-9}

- Manufactured by joining a piece of the polysaccharide capsule to a protein carrier
- Capable of eliciting long-term immunologic memory

- **Examples of conjugate vaccines that have been developed are:**¹⁰⁻¹³

- Monovalent vaccines available against serogroups C and A
- Combination vaccines available against serogroup C
- Multivalent vaccines available against serogroups A, C, W-135 and Y.

- **Protein-based vaccines:**¹³⁻¹⁵

- Protein-based vaccines, such as the *N. meningitidis* serogroup B vaccines, are composed of specific isolated proteins of *N. meningitidis* manufactured using recombinant DNA technology.

