

# Pneumococcal Polysaccharides

Diseases caused by the bacterium *Streptococcus pneumoniae* are a major global health concern. Millions of people become infected with this pathogen each year, developing serious conditions such as pneumonia, meningitis, and otitis media. Currently, it is estimated that pneumococcal diseases result in the death of more than one-million children under five years of age every year, primarily in developing countries. The severity of these pneumococcal diseases is primarily attributed to variations in the composition and structure of the capsular antigen.

To aid in the analysis and prevention of pneumococcal disease, ATCC offers 28 types of pneumococcal polysaccharides from various sources. They are the same serotypes found in current commercially available vaccines.

Each polysaccharide is extracted and purified separately, making the products specific and useful as antigens in:

- Direct enzyme-linked immunosorbent assays (ELISA)
- Epidemiological studies
- In vitro immunological research

ATCC pneumococcal polysaccharides are available in three package sizes and new lots will be provided with a Certificate of Analysis that will include identity by NMR, residual protein, antigenicity, and molecular weight (exclusive for Pfizer products).

**Table 1: ATCC Pneumococcal Polysaccharides by USA and Danish Designations**

| Pneumococcal Type<br>USA Designation <sup>1</sup> | Danish Designation <sup>2</sup> | Available Volumes (ATCC® No.) |       |       | Source | Corresponding Strains (ATCC® No.) | PMEN Strains (ATCC® No.)                                  |
|---|---------------------------------|-------------------------------|-------|-------|--------|-----------------------------------|---|
|   |                                 | 2 mg                          | 10 mg | 200mg |        |                                   |   |
| 1   | 1                               | 15-X                          | 161-X | NA    | Merck  | 6301™, 9163™, 33400™              | BAA-1666™, BAA-1654™, BAA-1655™                           |
|   |                                 | 10-X                          | 12-X  | 13-X  | Pfizer |                                   |   |
| 2   | 2                               | 16-X                          | 165-X | 168-X | Merck  | 6302™                             |   |
|   |                                 | 500-X                         | 501-X | 502-X | Pfizer |                                   |   |
| 3   | 3                               | 17-X                          | 169-X | 172-X | Merck  | 6303™, 10813™                     | BAA-1657™   |
|   |                                 | 31-X                          | 32-X  | 33-X  | Pfizer |                                   |   |
| 4   | 4                               | 18-X                          | 173-X | 176-X | Merck  | 6304™, BAA-334™*                  | BAA-1664™   |
|   |                                 | 34-X                          | 35-X  | 36-X  | Pfizer |                                   |   |
| 5   | 5                               | 57-X                          | NA    | NA    | Merck  | 6305™                             | BAA-341™  |
|   |                                 | 37-X                          | 38-X  | 41-X  | Pfizer |                                   |   |
| 6   | 6A                              | 14-X                          | 271-X | 280-X | Pfizer | 6306™                             | BAA-659™, BAA-1667™                                       |
| 8   | 8                               | 20-X                          | 185-X | 188-X | Merck  | 6308™                             | BAA-1659™   |
|   |                                 | 503-X                         | 504-X | 505-X | Pfizer |                                   |   |
| 9   | 9N                              | 21-X                          | 189-X | 192-X | Merck  | 6309™                             |   |
|   |                                 | 506-X                         | 507-X | 508-X | Pfizer |                                   |   |
| 12  | 12F                             | 22-X                          | NA    | NA    | Merck  | 6312™                             | BAA-1660™   |
|   |                                 | 515-X                         | 516-X | 517-X | Pfizer |                                   |   |
| 14  | 14                              | 23-X                          | NA    | NA    | Merck  | 6314™, 700672™                    | BAA-340™, BAA-1661™, BAA-1658™, 700677™, 700676™, 700902™ |
|   |                                 | 73-X                          | 74-X  | 81-X  | Pfizer |                                   |   |
| 17  | 17F                             | 63-X                          | 201-X | 204-X | Merck  | 6317™                             |   |
|   |                                 | 521-X                         | 522-X | 523-X | Pfizer |                                   |   |

<sup>1</sup>United States designations chronologically indicate the antigens in order of recognition. <sup>2</sup>The Danish designation uses an alphanumeric system to indicate any known cross-reactivity. The number refers to the sero-capsular antigen group, and the letter represents related serotypes that cannot be distinguished. \* Bacterial genome is fully sequenced

| Pneumococcal Type            |                                 | Available Volumes (ATCC® No.) |       |       | Source | Corresponding Strains (ATCC® No.) | PMEN Strains (ATCC® No.)                      |
|------------------------------|---------------------------------|-------------------------------|-------|-------|--------|-----------------------------------|---|
| USA Designation <sup>1</sup> | Danish Designation <sup>2</sup> | 2 mg                          | 10 mg | 200mg |        |                                   |   |
| 19                           | 19F                             | 84-X                          | 99-X  | 101-X | Pfizer | 6319™, 49619™                     | BAA-657™, 700905™*                            |
| 22                           | 22F                             | 527-X                         | 528-X | 529-X | Pfizer | 6322™                             |   |
| 23                           | 23F                             | 25-X                          | 217-X | 220-X | Merck  | 6323™, 51938™                     | 51916™, BAA-343™, 700906™, 700669™*, BAA-662™ |
|                              |                                 | 102-X                         | 103-X | 104-X | Pfizer |                                   |   |
| 24                           | 24F                             | 551-X                         | 552-X | 553-X | Pfizer | 6324™, 700669™, BAA-662™          |   |
| 25                           | 25F                             | 530-X                         | 531-X | 532-X | Pfizer | 6325™, 12359™                     |   |
| 26                           | 6B                              | 105-X                         | 106-X | 107-X | Pfizer | 6326™, BAA-612™                   | BAA-658™, 700670™, BAA-342™, 700675™, 700903™ |
| 30                           | 15A                             | 536-X                         | 537-X | 538-X | Pfizer | BAA-661™                          |   |
| 34                           | 10A                             | 60-X                          | 229-X | 232-X | Merck  | 8334™                             |   |
|                              |                                 | 509-X                         | 510-X | 511-X | Pfizer |                                   |   |
| 43                           | 11A                             | 61-X                          | 233-X | 236-X | Merck  | 10343™                            |   |
|                              |                                 | 512-X                         | 513-X | 514-X | Pfizer |                                   |   |
| 46                           | 23A                             | 545-X                         | 546-X | 547-X | Pfizer | 10346™                            |   |
| 51                           | 7F                              | 108-X                         | 281-X | 284-X | Pfizer | 10351™                            | BAA-1665™                                     |
| 54                           | 15B                             | 62-X                          | 241-X | 244-X | Merck  | 10354™                            | BAA-1663™                                     |
|                              |                                 | 518-X                         | 519-X | 520-X | Pfizer |                                   |   |
| 56                           | 18C                             | 285-X                         | 288-X | 289-X | Pfizer | 10356™                            | BAA-1662™                                     |
| 57                           | 19A                             | 64-X                          | 249-X | 252-X | Merck  | 10357™, BAA-475™                  | 700674™, 700673™*, 700678™, 700904™           |
|                              |                                 | 301-X                         | 302-X | 304-X | Pfizer |                                   |   |
| 64                           | 23B                             | 548-X                         | 549-X | 550-X | Pfizer | 10364™                            |   |
| 66                           | 35B                             | 539-X                         | 540-X | 541-X | Pfizer | 10366™                            |   |
| 68                           | 9V                              | 305-X                         | 325-X | 331-X | Pfizer | 10368™                            | 700671™                                       |
| 70                           | 33F                             | 67-X                          | 257-X | 260-X | Merck  | 10370™                            |   |
|                              |                                 | 533-X                         | 534-X | 535-X | Pfizer |                                   |   |
| 71                           | 38                              | 542-X                         | 543-X | 544-X | Pfizer | 10371™                            |   |

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### Additional resources for pneumococcal polysaccharide research

The **Pneumococcal Molecular Epidemiology Network (PMEN)** provides detailed information on strains listed in the preceding table, including typing by Pulsed-field gel electrophoresis (PFGE), multilocus sequencing, and PBP fingerprinting. Data for strains analyzed by PMEN are available online at [www.sph.emory.edu/PMEN](http://www.sph.emory.edu/PMEN).

The **NIST Chemistry WebBook** contains IR, mass, electronic/vibrational, and UV/VIS spectra as well as constants of diatomic molecules (spectroscopic data) and ion energetics data drawn from various evaluated sources. The WebBook is available online at [www.webbook.nist.gov/chemistry](http://www.webbook.nist.gov/chemistry).

The **Spectral Database System (SDBS)**, managed by the National Institute of Materials and Chemical Research in Japan, contains IR, 1H-NMR, 13C-NMR, mass, and ESR spectra of organics. The SDBS is available online at [www.sdbs.riodb.aist.go.jp/sdbs/cgi-bin/direct\\_frame\\_top.cgi](http://www.sdbs.riodb.aist.go.jp/sdbs/cgi-bin/direct_frame_top.cgi).

The **RCSB Protein Data Bank (PDB)** provides structural analysis and sequence data for *Streptococcus pneumoniae* proteins, including those related to ATCC® BAA-255™ (non-virulent) and ATCC® BAA-334™ (capsular serotype 4) fully genome sequenced strains. PDB is available online at [www.rcsb.org/pdb](http://www.rcsb.org/pdb).

See our online catalog at [www.atcc.org/polysaccharides](http://www.atcc.org/polysaccharides) for a full description of each item.

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