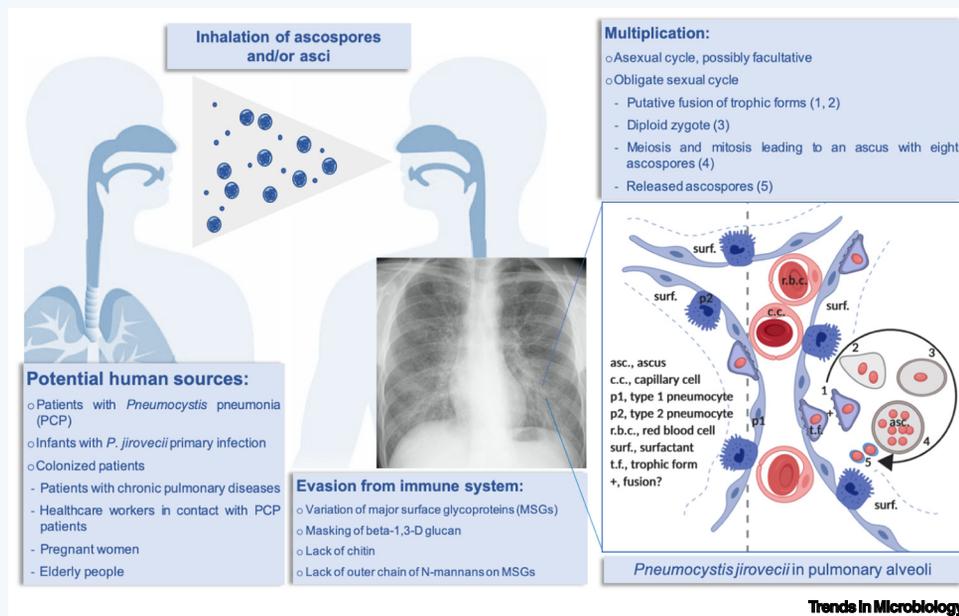


# *Pneumocystis jirovecii*

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*Pneumocystis jirovecii* is an ascomycete, specific for humans, characterized by a strong tropism for the lungs and airborne host-to-host transmission. This pathogen constitutes a unique phenomenon in medical mycology. *Pneumocystis pneumonia* (PCP) was a major cause of morbidity and mortality among patients with HIV during the 1980s and 1990s, and it remains the main cause of AIDS-defining disease in developed countries. However, an increased frequency of PCP in patients without AIDS but with defects in cellular or global immunity has been reported. The fungus is also a co-morbidity factor in acute or chronic pulmonary diseases. Thus, *Pneumocystis* infections remain a serious public health issue, as attested by the 250 publications published annually on this topic recorded by the National Center for Biotechnology Information. Here, we summarize the present knowledge of *P. jirovecii* fundamental biology and epidemiology.

**KEY FACTS:**

*P. jirovecii* is a species that specifically infects humans.

It has a worldwide distribution.

It is not routinely cultivable.

It does not have a proven environmental niche.

It is transmitted through the air from host to host.

Ascospores contained in asci and/or the asci themselves represent the transmitted infectious stages.

It shows a strong tropism for the lungs.

It constitutes a unique phenomenon in medical mycology.

In the cytoplasmic membrane of *P. jirovecii*, ergosterol is replaced by cholesterol, explaining why this fungus is resistant to amphotericin B and azoles.

The first genome sequence of *P. jirovecii* was published in 2012 (8.1 Mbp long and containing 3898 coding genes).

**DISEASE FACTS:**

*P. jirovecii* is an opportunistic fungus that causes life-threatening pneumonia in immunocompromised patients (*Pneumocystis pneumonia*, PCP). PCP is the most frequent AIDS-defining disease in developed countries, with an incidence of ~400 000 cases with ~50 000 deaths.

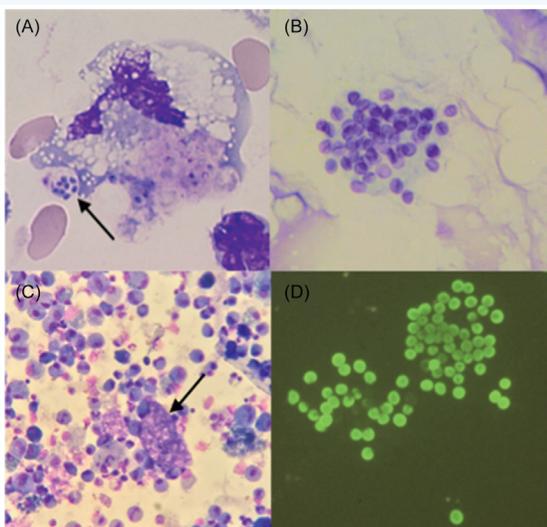
Torpid infections may occur in patients with acute or chronic bronchopulmonary disease, primary infected infants, pregnant women, and healthcare workers in contact with infected patients. These colonized patients and patients with PCP represent sources of the infection in both the community and hospitals.

The first line for treatment is sulfamethoxazole-trimethoprim (SMX-TMP).

The combination of SMX-TMP with echinocandins requires further evaluation.

Although chemoprophylaxis remains essential, isolation measures for infected patients within hospitals are required.

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(A) Ascus containing ascospores (indicated by the arrow, Wright Giemsa stain, × 1000). (B) Asci (Toluidine blue stain, × 400). (C) Cluster of *Pneumocystis jirovecii* organisms (indicated by the arrow, Wright Giemsa stain, × 100). (D) Asci [two-step indirect fluorescent antibody (IFA), anti-ascus antibodies, MONOFLUO Kit *P. jirovecii* Bio-Rad, × 400].

**TAXONOMY AND CLASSIFICATION:**

- KINGDOM:** Fungi
- PHYLUM:** Ascomycota
- SUB-PHYLUM:** Taphrinomycotina
- CLASS:** Pneumocystomycetes
- ORDER:** Pneumocystidales
- FAMILY:** Pneumocystidaceae
- GENUS:** *Pneumocystis*
- SPECIES:** *jirovecii*



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