

- malignancies and stem cell transplant recipients. *J Antimicrob Chemother.* 2016;71:2386–96. <http://dx.doi.org/10.1093/jac/dkw156>
26. Hunter PR. Reproducibility and indices of discriminatory power of microbial typing methods. *J Clin Microbiol.* 1990;28:1903–5.
 27. Wynckel A, Toubas D, Noël N, Toupance O, Rieu P. Outbreak of *pneumocystis* pneumonia occurring in late post-transplantation period. *Nephrol Dial Transplant.* 2011;26:2417–8, author reply 2418. <http://dx.doi.org/10.1093/ndt/gfr159>
 28. Valade S, Azoulay E, Damiani C, Derouin F, Totet A, Menotti J. *Pneumocystis jirovecii* airborne transmission between critically ill patients and health care workers. *Intensive Care Med.* 2015;41:1716–8. <http://dx.doi.org/10.1007/s00134-015-3835-9>
 29. Hauser PM, Blanc DS, Sudre P, Senggen Manloff E, Nahimana A, Bille J, et al. Genetic diversity of *Pneumocystis carinii* in HIV-positive and -negative patients as revealed by PCR-SSCP typing. *AIDS.* 2001;15:461–6. <http://dx.doi.org/10.1097/00002030-200103090-00004>
 30. Rabodonirina M, Vanhems P, Couray-Targe S, Gillibert R-P, Ganne C, Nizard N, et al. Molecular evidence of interhuman transmission of *Pneumocystis* pneumonia among renal transplant recipients hospitalized with HIV-infected patients. *Emerg Infect Dis.* 2004;10:1766–73. <http://dx.doi.org/10.3201/eid1010.040453>
 31. Le Gal S, Damiani C, Rouillé A, Grall A, Tréguer L, Virmaux M, et al. A cluster of *Pneumocystis* infections among renal transplant recipients: molecular evidence of colonized patients as potential infectious sources of *Pneumocystis jirovecii*. *Clin Infect Dis.* 2012;54:e62–71. <http://dx.doi.org/10.1093/cid/cir996>
 32. Alanio A, Gits-Muselli M, Mercier-Delarue S, Dromer F, Bretagne S. Diversity of *Pneumocystis jirovecii* during infection revealed by ultra-deep pyrosequencing. *Front Microbiol.* 2016;7:733. <http://dx.doi.org/10.3389/fmicb.2016.00733>
 33. Le Gal S, Blanchet D, Damiani C, Guéguen P, Virmaux M, Abboud P, et al. AIDS-related *Pneumocystis jirovecii* genotypes in French Guiana. *Infect Genet Evol.* 2015;29:60–7. <http://dx.doi.org/10.1016/j.meegid.2014.10.021>
 34. Beser J, Hagblom P, Fernandez V. Frequent in vitro recombination in internal transcribed spacers 1 and 2 during genotyping of *Pneumocystis jirovecii*. *J Clin Microbiol.* 2007;45:881–6. <http://dx.doi.org/10.1128/JCM.02245-06>
 35. Struelens MJ. Consensus guidelines for appropriate use and evaluation of microbial epidemiologic typing systems. *Clin Microbiol Infect.* 1996;2:2–11. <http://dx.doi.org/10.1111/j.1469-0691.1996.tb00193.x>
 36. Urabe N, Ishii Y, Hyodo Y, Aoki K, Yoshizawa S, Saga T, et al. Molecular epidemiologic analysis of a *Pneumocystis* pneumonia outbreak among renal transplant patients. *Clin Microbiol Infect.* 2016;22:365–71. <http://dx.doi.org/10.1016/j.cmi.2015.12.017>
 37. Chen Y, Frazzitta AE, Litvintseva AP, Fang C, Mitchell TG, Springer DJ, et al. Next generation multilocus sequence typing (NGMLST) and the analytical software program MLST-EZ enable efficient, cost-effective, high-throughput, multilocus sequencing typing. *Fungal Genet Biol.* 2015;75:64–71. <http://dx.doi.org/10.1016/j.fgb.2015.01.005>

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Pneumocystis jirovecii [noo"mo-sis'tis ye"ro-vet'ze]

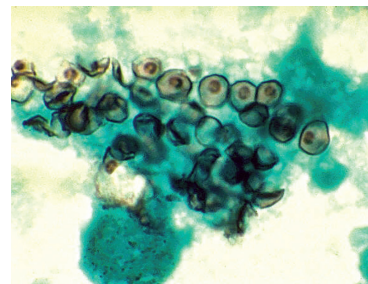
Ronnie Henry

A genus of unicellular fungi, *Pneumocystis* was likely originally described by Carlos Chagas in 1909 in guinea pigs, although he confused it with a trypanosome and placed it in a new genus, *Schizotrypanum*. In 1912, Delanoë and Delanoë at the Pasteur Institute published the first description of the new organism as unrelated to trypanosomes and proposed the species name *P. carinii* in honor of Antonio Carini.

Human *Pneumocystis* infections were first reported in 1942 by van der Meer and Brug, but not until 1976 did Frenkel report different morphologic and physiologic characteristics of human and rat *Pneumocystis* isolates. He proposed the name *P. jirovecii* in honor of Czech parasitologist Otto Jirovec, who reported *Pneumocystis* as a cause of interstitial pneumonia in infants, although this name change was not accepted by researchers at the time. When *Pneumocystis* was reclassified from a protozoan to a fungus, the naming convention shifted from the International Code of Zoological Nomenclature to the International Code of Botanical Nomenclature, and the species epithet was modified from *jiroveci* to *jirovecii*.

Sources

1. Frenkel JK. *Pneumocystis jiroveci* n. sp. from man: morphology, physiology, and immunology in relation to pathology. *Natl Cancer Inst Monogr.* 1976;43:13–30.
2. Hawksworth DL. Responsibility in naming pathogens: the case of *Pneumocystis jirovecii*, the causal agent of pneumocystis pneumonia. *Lancet Infect Dis.* 2007;7:3–5, discussion 5. [http://dx.doi.org/10.1016/S1473-3099\(06\)70663-6](http://dx.doi.org/10.1016/S1473-3099(06)70663-6)
3. Stringer JR, Beard CB, Miller RF, Wakefield AE. A new name (*Pneumocystis jiroveci*) for *Pneumocystis* from humans and new perspectives on the host-pathogen relationship. *Emerg Infect Dis.* 2002;8:891–6. <http://dx.doi.org/10.3201/eid0809.020096>
4. Stringer JR, Beard CB, Miller RF. Spelling *Pneumocystis jirovecii*. *Emerg Infect Dis.* 2009;15:506. <http://dx.doi.org/10.3201/eid1503.081060>
5. Walzer PD, Smulian AG. *Pneumocystis* species. In: Mandell GL, Bennett, JE, Dolin R, editors. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Disease.* 7th edition. Philadelphia: Elsevier; 2010. p. 3377–90.



Cysts of *Pneumocystis jirovecii* in smear from bronchoalveolar lavage. Methenamine silver stain. CDC/Dr. Russell K. Brynes

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