Profile
Azidocillin is a semisynthetic penicillin with actions and uses similar to those of phenoxymethylpenicillin (p.314). It is given orally as the sodium salt; doses, expressed in terms of the base, are 750 mg twice daily in the treatment of susceptible infections. The potassium salt has also been used.

Preparations
Proprietary Preparations (details are given in Part 3)
Ger.: InfectoBicillin H.

Azithromycin *(BAN, USAN, rINN)*

Atsitromysiini; Azithromycine; Azithromycinum; Azitromicina; Azitromicinas; Azitromisin; Azitromycin; Azytromycyna; CP-62993; XZ-450. (2*R*,3*S*,4*R*,5*R*,8*R*,10*R*,11*R*,12*S*,13*S*,14*R*)-13-(2,6-Dideoxy-3-*C*-3-*O*-dimethyl-α-L-*ribo*-hexopyranosyloxy)-2-ethyl-3,4,10-trihydroxy-3,5,6,8,10,12,14-heptamethyl-11-(3,4,6-trideoxy-3-dimethylamino-β-D-*xylo*-hexopyranosyloxy)-1-oxa-6-azacyclopentadecan-15-one dihydrate; 9-Deoxo-9a-aza-9a-methyl-9a-homoerythromycin A dihydrate.

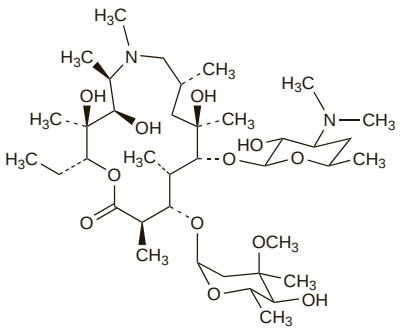
Азитромицин

$C_{38}H_{72}N_2O_{12},2H_2O$ = 785.0.

CAS — 83905-01-5 (anhydrous azithromycin); 117772-70-0 (azithromycin dihydrate).

ATC — J01FA10; S01AA26.

ATC Vet — QJ01FA10; QS01AA26.



Pharmacopoeias. In *Chin.* and *Jpn.*
Eur. (see p.vii) includes the anhydrous form.
US includes the monohydrate and the dihydrate.
Ph. Eur. 6.2 (Azithromycin). A white or almost white powder. Practically insoluble in water; freely soluble in dehydrated alcohol and in dichloromethane. A 0.2% solution in a mixture of methyl alcohol and water (1:1) has a pH of 9.0 to 11.0. Store in airtight containers.
USP 31 (Azithromycin). It is anhydrous or contains one or two molecules of water of hydration. pH of a 0.2% solution in a mixture of methyl alcohol and water (1:1) is between 9.0 and 11.0. Store in airtight containers.

Adverse Effects and Precautions
As for Erythromycin, p.270.

Gastrointestinal disturbances are the most frequent adverse effect of azithromycin but are usually mild and less frequent than with erythromycin. Headache, somnolence, and taste disturbances may occur. Severe hypersensitivity reactions occur rarely but may be prolonged. Thrombocytopenia and mild transient neutropenia have been rarely reported in patients receiving azithromycin. Pain and inflammation may occur at the site of intravenous infusions particularly at high concentrations.

Licensed product information states that azithromycin should be used with caution in patients with hepatic or renal impairment. It should not be given to those with severe hepatic impairment as safety has not been established. Although plasma concentrations may be increased in renal impairment dosage adjustment is not usually required.

Incidence of adverse effects. In patients receiving azithromycin daily long-term for mycobacterial infections,[1] gastrointestinal disorders occurred in 32 of 39 patients (82%), hearing impairment in 10 patients (26%), tinnitus in 18 patients (46%), and poor balance or dizziness in 11 patients (28%). In general, adverse effects were associated with higher serum-azithromycin concentrations.

1. Brown BA, *et al.* Relationship of adverse events to serum drug levels in patients receiving high-dose azithromycin for mycobacterial lung disease. *Clin Infect Dis* 1997; **24:** 958–64.

Effects on the ears. Reversible sensorineural hearing loss was reported in 3 patients given oral azithromycin 500 mg daily with clofazimine and ethambutol for the treatment of disseminated *Mycobacterium avium* complex infection.[1] Irreversible hearing loss has also been reported after low-dose exposure to oral azithromycin.[2,3] A patient who had had 8 days of treatment with intravenous azithromycin 500 mg daily for pneumonia reported complete deafness, which had resolved 20 days after stopping the drug.[4]

See also Incidence of Adverse Effects, above.

1. Wallace MR, *et al.* Ototoxicity with azithromycin. *Lancet* 1994; **343:** 241.
2. Ress BD, Gross EM. Irreversible sensorineural hearing loss as a result of azithromycin ototoxicity: a case report. *Ann Otol Rhinol Laryngol* 2000; **109:** 435–7.
3. Mick P, Westerberg BD. Sensorineural hearing loss as a probable serious adverse drug reaction associated with low-dose oral azithromycin. *J Otolaryngol* 2007; **36:** 257–63.
4. Bizjak ED, *et al.* Intravenous azithromycin-induced ototoxicity. *Pharmacotherapy* 1999; **19:** 245–8.

Effects on fluid and electrolyte homoeostasis. The syndrome of inappropriate antidiuretic hormone secretion was associated with azithromycin treatment in a patient.[1,2]

1. Cadle RM, *et al.* Symptomatic syndrome of inappropriate antidiuretic hormone secretion associated with azithromycin. *Ann Pharmacother* 1997; **31:** 1308–10.
2. Kintzel PE. Correction: symptomatic syndrome of inappropriate antidiuretic hormone secretion associated with azithromycin. *Ann Pharmacother* 1998; **32:** 388.

Effects on the kidneys. Acute interstitial nephritis leading to irreversible renal failure has been reported[1] in a patient who received azithromycin for 9 days. A later report[2] described a patient who developed recurrent acute interstitial nephritis after courses of azithromycin. Repeated exposure resulted in persistent renal damage; leucocytosis and eosinophilia were still present 1 year later.

1. Mansoor GA, *et al.* Azithromycin-induced acute interstitial nephritis. *Ann Intern Med* 1993; **119:** 636–7.
2. Soni N, *et al.* Recurrent acute interstitial nephritis induced by azithromycin. *Pediatr Infect Dis J* 2004; **23:** 965–6.

Eosinophilia. A syndrome characterised by eosinophilia, arthralgia, fever, and rash was associated with azithromycin or roxithromycin treatment in a patient on separate occasions.[1] The original authors believed the condition represented the Churg-Strauss syndrome, although this was disputed in correspondence[2] and attributed to the eosinophilia-myalgia syndrome.

1. Hübner C, *et al.* Macrolide-induced Churg-Strauss syndrome in a patient with atopy. *Lancet* 1997; **350:** 563.
2. Kränke B, Aberer W. Macrolide-induced Churg-Strauss syndrome in patient with atopy. *Lancet* 1997; **350:** 1551–2.

Overdosage. Bradycardia with complete heart block was reported[1] in a 9-month-old infant who had been inadvertently given about 50 mg/kg of azithromycin intravenously.

1. Tilelli JA, *et al.* Life-threatening bradyarrhythmia after massive azithromycin overdose. *Pharmacotherapy* 2006; **26:** 147–50.

Interactions
For a discussion of drug interactions of macrolide antibacterials, see Erythromycin, p.271.

Giving azithromycin with antacids containing aluminium or magnesium salts can reduce the rate, but not the extent, of its absorption; azithromycin should be given at least 1 hour before or 2 hours after the antacid.

Nelfinavir. Azithromycin serum concentrations are markedly increased when it is given with nelfinavir,[1] but the clinical significance of this is uncertain. US licensed product information for azithromycin states that dosage adjustment is not required although the patient should be closely monitored for adverse effects.

1. Amsden GW, *et al.* A study of the pharmacokinetics of azithromycin and nelfinavir when coadministered in healthy volunteers. *J Clin Pharmacol* 2000; **40:** 1522–7.

Antimicrobial Action
As for Erythromycin, p.271. Azithromycin is less active than erythromycin against streptococci and staphylococci, but has greater activity than erythromycin *in vitro* against some Gram-negative organisms such as *Haemophilus influenzae* and *Moraxella catarrhalis* (*Branhamella catarrhalis*), as well as having activity against some of the Enterobacteriaceae such as *Escherichia coli* and *Salmonella* and *Shigella* spp. Azithromycin is also more active than erythromycin against *Chlamydia trachomatis* and *Ureaplasma urealyticum*, and some opportunistic mycobacteria, including *Mycobacterium avium* complex. It has activity against the protozoa *Toxoplasma gondii* and *Plasmodium falciparum*.

Resistance. The pattern of resistance to azithromycin is similar to that seen with clarithromycin (p.249).

Pharmacokinetics
Azithromycin given orally is rapidly absorbed and about 40% bioavailable. Absorption from capsules, but not tablets or suspension, is reduced by food. Peak plasma concentrations occur 2 to 3 hours after an oral dose and 1 to 2 hours after intravenous dosage. However, azithromycin is extensively distributed into the tissues, and tissue concentrations subsequently remain much higher than those in the blood; in contrast to most other antibacterials, plasma concentrations are therefore of little value as a guide to efficacy. High concentrations are taken up into white blood cells. There is little diffusion into the CSF when the meninges are not inflamed. Data from *animal* studies indicate that azithromycin crosses the placenta. Small amounts of azithromycin are demethylated in the liver, and it is excreted in bile mainly as unchanged drug and a number of inactive metabolites have also been detected. About 6% of an oral dose (representing about 20% of the amount in the systemic circulation) is excreted in the urine. The terminal elimination half-life is about 68 hours.

◊ Reviews and references.

1. Lalak NJ, Morris DL. Azithromycin clinical pharmacokinetics. *Clin Pharmacokinet* 1993; **25:** 370–4.
2. Luke DR, *et al.* Safety, toleration, and pharmacokinetics of intravenous azithromycin. *Antimicrob Agents Chemother* 1996; **40:** 2577–81.
3. Rapp RP. Pharmacokinetics and pharmacodynamics of intravenous and oral azithromycin: enhanced tissue activity and minimal drug interactions. *Ann Pharmacother* 1998; **32:** 785–93.
4. Chandra R, *et al.* Clinical pharmacokinetics and gastrointestinal tolerability of a novel extended-release microsphere formulation of azithromycin. *Clin Pharmacokinet* 2007; **46:** 247–59.

Uses and Administration
Azithromycin is a nitrogen-containing macrolide (azalide) with actions and uses similar to those of erythromycin (p.272). It is given in the treatment of respiratory-tract infections (including otitis media), in skin and soft-tissue infections, and in uncomplicated genital infections. Azithromycin may also be used for the prophylaxis, and as a component of regimens in the treatment, of *Mycobacterium avium* complex (MAC) infections. It is used in some countries for the prophylaxis of endocarditis in at-risk patients unable to take penicillin. It is also used in the management of trachoma and typhoid.

For details of all these infections and their treatment, see under Choice of Antibacterial, p.162.

Azithromycin has been tried in protozoal infections such as babesiosis (below), crytosporidiosis (p.823), and toxoplasmosis (p.826).

It is given orally or by intravenous infusion usually as the dihydrate; doses are expressed in terms of the anhydrous substance. Azithromycin dihydrate 524 mg is equivalent to about 500 mg of anhydrous azithromycin. The capsule formulation should be given at least 1 hour before, or 2 hours after, meals.

The usual oral adult dose of azithromycin is 500 mg as a single dose daily for 3 days. Alternatively, an initial dose of 500 mg may be followed by 250 mg daily for a further 4 days.

For uncomplicated genital infections caused by *Chlamydia trachomatis* and for chancroid, 1 g of azithromycin is given as a single dose. A single dose of 2 g has been given for uncomplicated gonorrhoea. For the treatment of granuloma inguinale, an initial dose of 1 g followed by 500 mg daily may be given, or 1 g may be given once a week for at least 3 weeks, until all lesions have completely healed.

In the USA, a modified-release preparation given as an oral suspension is available. The product delivers a single dose of 2 g and should also be taken on an empty stomach. It is licensed for the treatment of acute bacterial sinusitis or community-acquired pneumonia in adults.

For prophylaxis of disseminated MAC infections, azithromycin 1.2 g may be given once weekly. For treatment or secondary prophylaxis, 500 mg once daily should be given with other antimycobacterials.

For mild or moderate typhoid caused by multidrug-resistant strains, 500 mg once daily may be given for 7 days.

For details of doses in infants and children, see below.

Azithromycin dihydrate may also be given initially by intravenous infusion to adults in doses equivalent to 500 mg of azithromycin as a single daily dose in the treatment of community-acquired pneumonia and pelvic inflammatory disease; treatment should be changed to the oral route after at least 2 days in pneumonia and after 1 or 2 days in pelvic inflammatory disease. It may be given either in a solution containing 1 mg/mL over 3 hours or in a solution containing 2 mg/mL over 1 hour.

In the USA, azithromycin is available as 1% eye drops for the topical treatment of conjunctivitis caused by susceptible strains of bacteria.

◊ Reviews.

1. Peters DH, *et al.* Azithromycin: a review of its antimicrobial activity, pharmacokinetic properties and clinical efficacy. *Drugs* 1992; **44:** 750–99.
2. Langtry HD, Balfour JA. Azithromycin: a review of its use in paediatric infectious disease. *Drugs* 1998; **56:** 273–97.
3. Alvarez-Elcoro S, Enzler MJ. The macrolides: erythromycin, clarithromycin, and azithromycin. *Mayo Clin Proc* 1999; **74:** 613–34.
4. Garey KW, Amsden GW. Intravenous azithromycin. *Ann Pharmacother* 1999; **33:** 218–28.
5. Ioannidis JPA, *et al.* Meta-analysis of randomized controlled trials on the comparative efficacy and safety of azithromycin against other antibiotics for upper respiratory tract infections. *J Antimicrob Chemother* 2001; **48:** 677–89.
6. Contopoulos-Ioannidis DG, *et al.* Meta-analysis of randomized controlled trials on the comparative efficacy and safety of azithromycin against other antibiotics for lower respiratory tract infections. *J Antimicrob Chemother* 2001; **48:** 691–703.
7. Zuckerman JM. Macrolides and ketolides: azithromycin, clarithromycin, telithromycin. *Infect Dis Clin North Am* 2004; **18:** 621–49.
8. Law C, Amsden GW. Single-dose azithromycin for respiratory tract infections. *Ann Pharmacother* 2004; **38:** 433–9.
9. Blumer JL. Evolution of a new drug formulation: the rationale for high-dose, short-course therapy with azithromycin. *Int J Antimicrob Agents* 2005; **26** (suppl 3): S143–S147.
10. Swainston Harrison T, Keam SJ. Azithromycin extended release: a review of its use in the treatment of acute bacterial sinusitis and community-acquired pneumonia in the US. *Drugs* 2007; **67:** 773–92.
11. Panpanich R, *et al.* Azithromycin for acute lower respiratory tract infections. Available in The Cochrane Database of Systematic Reviews; Issue 1. Chichester: John Wiley; 2008 (accessed 18/06/08).

Administration in children. Azithromycin is licensed for use in infants and children and the usual oral dose in those over 6 months of age is 10 mg/kg once daily for 3 days, or an initial dose of 10 mg/kg may be followed by 5 mg/kg daily for a further 4 days; those who weigh over 45 kg may be given the usual adult dose (see above). A single dose of 30 mg/kg may also be given for acute otitis media. For pharyngitis or tonsillitis in children aged over 2 years, 12 mg/kg once daily for 5 days may be given.

US official guidelines suggest that for prophylaxis of disseminated *Mycobacterium avium* complex infections, azithromycin 20 mg/kg (to a maximum of 1.2 g) once weekly or 5 mg/kg (to a maximum of 250 mg) once daily may be given.[1] For treatment, 10 to 12 mg/kg (to a maximum of 500 mg) once daily should be given with other antimycobacterials.[2]

In the UK, the *BNFC* suggests that azithromycin may be used in penicillin allergic children for the prevention of secondary cases of group A streptococcal infection; those 6 months and older may be given an oral dose of 12 mg/kg (to a maximum of 500 mg) once daily for 5 days.

The *BNFC* also suggests giving azithromycin 10 mg/kg once daily for 7 days in the treatment of mild to moderate typhoid caused by multidrug-resistant strains in those aged 6 months and over.

1. CDC. Guidelines for preventing opportunistic infections among HIV-infected persons—2002: recommendations of the US Public Health Service and the Infectious Diseases Society of America. *MMWR* 2002; **51** (RR-8): 1–52. Also available at: http://www.cdc.gov/mmwr/PDF/rr/rr5108.pdf (accessed 01/05/07)
2. CDC. Treating opportunistic infections among HIV-exposed and infected children: recommendations from CDC, the National Institutes of Health, and the Infectious Diseases Society of America. *MMWR* 2004; **53** (RR-14): 1–63. Also available at: http://www.cdc.gov/mmwr/PDF/RR/RR5314.pdf (accessed 01/05/07)

Babesiosis. In a prospective, randomised study[1] involving 58 patients with babesiosis (p.823), azithromycin with atovaquone was found to be as effective as, and associated with fewer adverse effects than, standard therapy with quinine and clindamycin. Azithromycin 600 mg once daily, or 500 to 1000 mg on day 1 followed by 250 mg once daily thereafter, with atovaquone 750 mg twice daily, both orally for 7 to 10 days, has been recommended by some experts[2,3] in the USA for the treatment of *Babesia microti* infections. Immunocompromised patients may be given higher doses of azithromycin (600 to 1000 mg daily). Children may be given azithromycin 12 mg/kg once daily, or 10 mg/kg on day 1 followed by 5 mg/kg once daily thereafter, with atovaquone 20 mg/kg twice daily, both orally for 7 to 10 days. Azithromycin with quinine was reported to be effective in 2 patients who had not responded to quinine plus clindamycin.[4,5]

1. Krause PJ, *et al.* Atovaquone and azithromycin for the treatment of babesiosis. *N Engl J Med* 2000; **343:** 1454–8.
2. Abramowicz M, ed. *Drugs for parasitic infections*. 1st ed. New Rochelle NY: The Medical Letter, 2007.
3. Wormser GP, *et al.* The clinical assessment, treatment, and prevention of Lyme disease, human granulocytic anaplasmosis, and babesiosis: clinical practice guidelines by the Infectious Diseases Society of America. *Clin Infect Dis* 2006; **43:** 1089–1134. Also available at: http://www.journals.uchicago.edu/doi/pdf/10.1086/508667 (accessed 12/08/08)
4. Shaio MF, Yang KD. Response of babesiosis to a combined regimen of quinine and azithromycin. *Trans R Soc Trop Med Hyg* 1997; **91:** 214–15.
5. Shih C-M, Wang C-C. Ability of azithromycin in combination with quinine for the elimination of babesial infection in humans. *Am J Trop Med Hyg* 1998; **59:** 509–12.

Cholera. Azithromycin has been tried[1-3] in the treatment of cholera (p.172). A single dose of 10 or 20 mg/kg was found to be effective in children[1,2] and 1 g in adults.[3]

1. Khan WA, *et al.* Comparison of single-dose azithromycin and 12-dose, 3-day erythromycin for childhood cholera: a randomised, double-blind trial. *Lancet* 2002; **360:** 1722–7.
2. Bhattacharya MK, *et al.* Azithromycin in the treatment of cholera in children. *Acta Paediatr* 2003; **92:** 676–8.
3. Saha D, *et al.* Single-dose azithromycin for the treatment of cholera in adults. *N Engl J Med* 2006; **354:** 2452–62.

Hyperplasia. For reference to the use of azithromycin to control ciclosporin-induced gingival hyperplasia, see p.1824.

Ischaemic heart disease. Macrolide antibacterials, including azithromycin,[1-4] clarithromycin,[5-9] and roxithromycin,[10-14] have been investigated in the prevention of ischaemic heart disease, based on a suggested link between atherosclerosis and infection with *Chlamydophila pneumoniae* (*Chlamydia pneumoniae*) (see p.166). Although preliminary results from some pilot studies were promising, longer-term studies in large numbers of patients were disappointing and none of the three macrolides decreased ischaemic events or provided clinical benefit; indeed, in one study[9] an unexpected increase in cardiovascular mortality was seen in those taking clarithromycin.

1. Anderson JL, *et al.* Randomized secondary prevention trial of azithromycin in patients with coronary artery disease and serological evidence for Chlamydia pneumoniae infection: the Azithromycin in Coronary Artery Disease: Elimination of Myocardial Infection with Chlamydia (ACADEMIC) study. *Circulation* 1999; **99:** 1540–7.
2. Cercek B, *et al.* Effect of short-term treatment with azithromycin on recurrent ischaemic events in patients with acute coronary syndrome in the Azithromycin in Acute Coronary Syndrome (AZACS) trial: a randomised controlled trial. *Lancet* 2003; **361:** 809–13.
3. O'Connor CM, *et al.* Azithromycin for the secondary prevention of coronary heart disease events: the WIZARD study: a randomized controlled trial. *JAMA* 2003; **290:** 1459–66.
4. Grayston JT, *et al.* Azithromycin for the secondary prevention of coronary events. *N Engl J Med* 2005; **352:** 1637–45.
5. Sinisalo J, *et al.* Effect of 3 months of antimicrobial treatment with clarithromycin in acute non-Q-wave coronary syndrome. *Circulation* 2002; **105:** 1555–60.
6. Berg HF, *et al.* Effect of clarithromycin on inflammatory markers in patients with atherosclerosis. *Clin Diagn Lab Immunol* 2003; **10:** 525–8.
7. Berg HF, *et al.* Treatment with clarithromycin prior to coronary artery bypass graft surgery does not prevent subsequent cardiac events. *Clin Infect Dis* 2005; **40:** 358–65.
8. Berg HF, *et al.* Effect of clarithromycin treatment on Chlamydia pneumoniae in vascular tissue of patients with coronary artery disease: a randomized, double-blind, placebo-controlled trial. *J Clin Microbiol* 2005; **43:** 1325–9.
9. Jespersen CM, *et al.* Randomised placebo controlled multicentre trial to assess short term clarithromycin for patients with stable coronary heart disease: CLARICOR trial. *BMJ* 2006; **332:** 22–7. Correction. *ibid.*; 151.
10. Gurfinkel E, *et al.* Treatment with the antibiotic roxithromycin in patients with acute non-Q-wave coronary syndromes: the final report of the ROXIS Study. *Eur Heart J* 1999; **20:** 121–7.
11. Wiesli P, *et al.* Roxithromycin treatment prevents progression of peripheral arterial occlusive disease in Chlamydia pneumoniae seropositive men: a randomized, double-blind, placebo-controlled trial. *Circulation* 2002; **105:** 2646–52.
12. Zahn R, *et al.* Antibiotic therapy after acute myocardial infarction: a prospective randomized study. *Circulation* 2003; **107:** 1253–9.
13. Sander D, *et al.* Progression of early carotid atherosclerosis is only temporarily reduced after antibiotic treatment of Chlamydia pneumoniae seropositivity. *Circulation* 2004; **109:** 1010–15.
14. Kaehler J, *et al.* A randomized trial in patients undergoing percutaneous coronary angioplasty: roxithromycin does not reduce clinical restenosis but angioplasty increases antibody concentrations against Chlamydia pneumoniae. *Am Heart J* 2005; **150:** 987–93.

Malaria. Azithromycin has been studied[1-7] in the management of malaria. Studies[1,4] have shown that an initial loading dose of 750 mg of azithromycin on the first day followed by 250 mg daily thereafter for 20 weeks was effective in the prophylaxis of *Plasmodium vivax* malaria; the drug was well tolerated and the most frequently reported adverse effects were heartburn, paraesthesia, and itching.[3] In the treatment of *P. vivax* malaria, a study[5] found that azithromycin 1 g daily for 3 days resulted in an 88% clinical response rate by day 7, but with a slower onset of action, when compared with chloroquine 600 mg daily for 2 days then 300 mg on day 3 which resulted in a rate of 99%.

Azithromycin in a dose of 0.5 g once daily up to 1.5 g daily in divided doses together with other antimalarials, such as artesunate 200 mg daily[2,7] or quinine 10 mg/kg 3 times daily,[6,7] given for 3 days was found to be effective in the treatment of uncomplicated multidrug-resistant *P. falciparum* malaria.

However, further studies are warranted, especially in children and pregnant women.

1. Taylor WR, *et al.* Malaria prophylaxis using azithromycin: a double-blind, placebo-controlled trial in Irian Jaya, Indonesia. *Clin Infect Dis* 1999; **28:** 74–81.
2. Krudsood S, *et al.* A randomized clinical trial of combinations of artesunate and azithromycin for treatment of uncomplicated Plasmodium falciparum malaria in Thailand. *Southeast Asian J Trop Med Public Health* 2000; **31:** 801–7.
3. Taylor WR, *et al.* Tolerability of azithromycin as malaria prophylaxis in adults in Northeast Papua, Indonesia. *Antimicrob Agents Chemother* 2003; **47:** 2199–2203.
4. Heppner DG, *et al.* Randomized, controlled, double-blind trial of daily oral azithromycin in adults for the prophylaxis of Plasmodium vivax malaria in Western Thailand. *Am J Trop Med Hyg* 2005; **73:** 842–9.
5. Dunne MW, *et al.* A double-blind, randomized study of azithromycin compared to chloroquine for the treatment of Plasmodium vivax malaria in India. *Am J Trop Med Hyg* 2005; **73:** 1108–11.
6. Miller RS, *et al.* Effective treatment of uncomplicated Plasmodium falciparum malaria with azithromycin-quinine combinations: a randomized, dose-ranging study. *Am J Trop Med Hyg* 2006; **74:** 401–6.
7. Noedl H, *et al.* Azithromycin combination therapy with artesunate or quinine for the treatment of uncomplicated Plasmodium falciparum malaria in adults: a randomized, phase 2 clinical trial in Thailand. *Clin Infect Dis* 2006; **43:** 1264–71.

Respiratory disorders. For reference to the use of azithromycin in the management of respiratory disorders, see under Erythromycin, p.273.

Preparations

USP 31: Azithromycin Capsules.

Proprietary Preparations (details are given in Part 3)

Arg.: Arzomicin; Azitral; Azitrogal; Azitrolan; Azitrona; Azitrox; Clearsing; Cronopen; Doyle; Fabramicina; Finatres†; Macromax; Misultina; Naxocina; Neblic; Nifostin; Novozitron; Orobiotic; Sitrox; Sumir†; Talcilina; Tanezox; Triamid; Tritab; Vectocilina; Zitromax; ***Austral.:*** Zithromax; ***Austria:*** Zithromax; ***Belg.:*** Zitromax; ***Braz.:*** Astro; Atromicin; Azatill; Azi; Azidromic†; Azimed; Azimix; Azitrax†; Azitrin; Azitrogran; Azitrolab; Azitromicil; Azitromin†; Azitron; Azitronax†; Azitroxil; Biozitrom†; Clindal; Ems-Max; Mac Azi; Mazitrom; Novatrex; Selimax; Selimax Pulso; Siftromin†; Triazi†; Tromix; Trozyman; Zimicina†; Zitril; Zitromax; Zitromil; Zitroneo; ***Canad.:*** Z-Pak; Zithromax; ***Chile:*** Abacten; Aspiral†; Atizor; Azitrom; Ricilina; Trex; Zithromax; ***Cz.:*** Azibiot; Azitrox; Sumamed; Zitrocin; ***Denm.:*** Zitromax; ***Fin.:*** Zithromax; ***Fr.:*** Azadose; Zithromax; ***Ger.:*** Ultreon; Zithromax; ***Gr.:*** Azibactron; Azifarm; Azirox; Azirutec; Azithral; Azithrin; Azitrolid; Azivirus; Azytan; Bezanin; Disithrom; Figothrom; Goldamycin; Gramokil; Novozithron; Zinfect; Zithro-Due; Zithromax; Zithropan; Zithrotel; Zithroxyn; Zitrax; ***Hong Kong:*** Zithromax; ***Hung.:*** Azi; Azicid; Sumamed; Zitrocin; ***India:*** Azee; Azibact; Azifast; Azithral; Aziwok; Zithrocin; Zycin; ***Indon.:*** Aztrin; Binozyt; Mezatrin; Zarom; Zibramax; Zicho; Zifin; Zistic; Zithromax; Zycin; ***Irl.:*** Azromax; Zithromax; ***Israel:*** Azenil; Zeto; Zithromax; ***Ital.:*** Azitrocin; Ribotrex; Trozocina; Zitromax; ***Malaysia:*** Zithromax; ***Mex.:*** Amsati; Azibiot; Aziphar; Azitrocin; Azitrohexal; Azo-Max; Koptin; Macrozit; Medatz; Sicalan; Texis; Tromicina; Truxa; Zertalin; Zithran; Zitroken; ***Neth.:*** Azacleus; Azitro; Merckazitro; Nucaza; Zithromax; ***Norw.:*** Azitromax; ***NZ:*** Zithromax; ***Philipp.:*** Zithromax; ZMax; ***Pol.:*** Azibiot; Azimycin; Azitrox; Macromax; Oranex; Sumamed; ***Port.:*** 3Z; Arzomicina†; Azimax; Aziton; Azitrix; Biozitra; Gigatrom; Lazitrom; Neofarmiz; Unizitro; Vascin; Zithromax; Zitrozina; ***Rus.:*** Azithrox (Азитрокс); Azithrus (Азитрус); Azitral (Азитрал); Aziwok (Азивок); Hemomycin (Хемомицин); Sumamed (Сумамед); Zetamax (Зетамакс); ZI-Factor (ЗИ-фактор); Zithrocin (Зитроцин); Zitrolid (Зитролид); ***S.Afr.:*** Zithrogen; Zithromax; ***Singapore:*** Zithromax; ***Spain:*** Altezym; Goxil; Pefloden; Toraseptol; Vinzam; Zentavion; Zitromax; ***Swed.:*** Azitromax; ***Switz.:*** Zithromax; ***Thai.:*** Binozyt; Zithromax; ***Turk.:*** Azacid; Azeltin; Azitro; Azomax; Azro; Tremac; Zitromax; Zitrotek; ***UAE:*** Azomycin; ***UK:*** Zithromax; ***USA:*** AzaSite; Zithromax; Zmax; ***Venez.:*** Amizin; Amovin; Aruzilina; Arzomidol; Atromizin; Azigram; Azimakrol; Azitrom; Azitromin; Binozyt; Saver; Zitromax; Zival.

Multi-ingredient: ***India:*** Orflaz Kit; Safkit; ***Mex.:*** Zithroflam.

Azlocillin *(BAN, USAN, rINN)*

Atslosilliini; Azlocilina; Azlocilline; Azlocillinum. 6-[*N*-(2-Oxoimidazolidin-1-ylcarbonyl)-D-phenylglycylamino]penicillanic acid.

Азлоциллин

$C_{20}H_{23}N_5O_6S$ = 461.5.

CAS — 37091-66-0.

ATC — J01CA09.

ATC Vet — QJ01CA09.