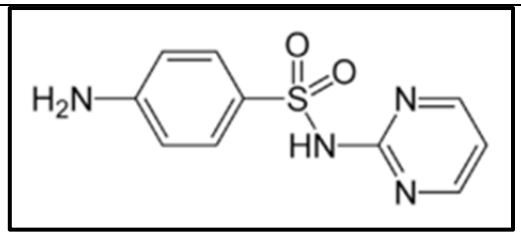
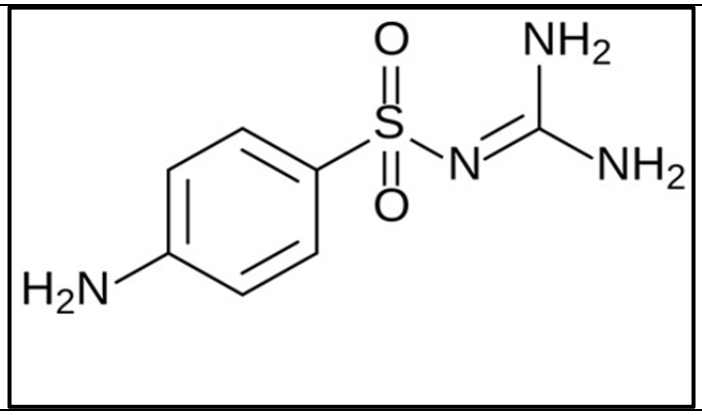
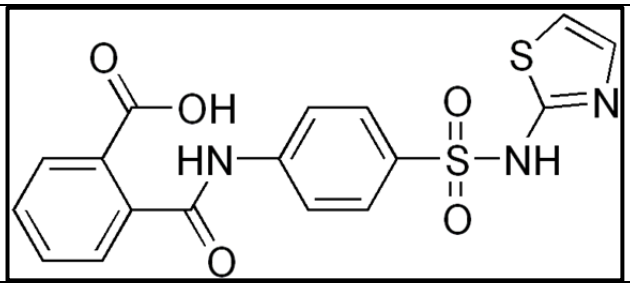
Sulfonamides

Name	Sulphadiazine
Synonym	• 2-sulfanilamidopyrimidine • Sulfadiazin • Sufapyrimidine • Sulfazine
IUPAC Name	4-amino-*N*-pyrimidin-2-ylbenzenesulfonamide
Chemical Structure	
Uses	• It is an antibiotic that is used in the treatment of urinary tract infections, ear infections, rheumatic fever, conjunctivitis and chlamydial infections. • It is used along with pyrimethamine to treat toxoplasmosis. • Silver sulfadiazine is commonly used as an antibacterial and antifungal agent topically.
Physicochemical properties	• **Melting point :** 255.5 □C • **Water solubility:** 77 mg/L at 25 □C • **Lipophilicity (Log P):** -0.09 • **Dissociation constant (pKa):** 6.99 • **Molecular weight:** 250.28 g/mol
Mechanism of Action	• It is a synthetic sulfonamide derivative that is bacteriostatic against a wide spectrum of gram-positive and gram-negative bacteria. • This antibiotic inhibits folic acid synthesis through competitive inhibition of p-amino benzoic acid. As a result of this bacterial multiplication is inhibited.
Stability and storage condition	• Stable under normal conditions but undergoes thermal decomposition when exposed to direct heat. It is incompatible with strong oxidizing agents. • Store in a cool, dry and tightly-closed container. It should be kept away from direct light.
Pharmaceutical formulations	• Suppository • Cream • Tablet • Suspension

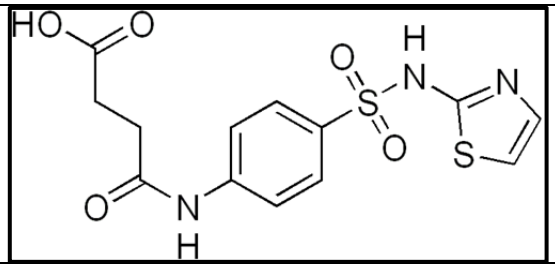
Brand name	• Sulfadiazine tablet • Adiazine • Other popular brands containing sulfadiazine as an active ingredient include: ✓Coptin oral suspension ✓Coptin tablet ✓Ovoquinol cream vaginale ✓Ovoquinol cones ✓Trisulfaminic suspension ✓Trisulfaminic tablet

Name	Sulphaguanidine
Synonym	• Sulfaguanidine • Sulfaguine • Sulfaguanidin • Sulfaguanidium
IUPAC Name	2-(4-aminophenyl)sulfonylguanidine
Chemical Structure	
Uses	• It is used in the treatment of bacillary dysentery, enteritis and other enteric infections. • It is also the first-choice drug for the treatment of leprosy. Other conditions for which it is used include herpetiformis, lupus, psoriasis and foot fungus disease. • It can also be used to treat bacterial infections in animals.
Physicochemical properties	• **Melting point :** 191.5 □C • **Water solubility:** 0.805mg/mL • **Lipophilicity (Log P):** -1.22 • **Dissociation constant (pKa):** 10.53 • **Molecular weight:** 214.25 g/mol

Mechanism of Action	• It is a guanidine derivative of sulfanilamide that acts by inhibiting the bacterial enzyme, dihydropteroate synthase. This in turn inhibits the synthesis of dihydrofolic acid and alters DNA synthesis. • Thereby it produces a bacteriostatic effect and arrests bacterial multiplication.
Stability and storage condition	• It is stable at normal conditions but is incompatible with strong oxidizing agents. • It must be stored in well-closed containers and kept away from light. It is preferably stored in low temperatures (~20 □C).
Pharmaceutical formulations	Tablets
Brand name	• Bioguanil • Canidiarix (veterinary use) • Carbon sulfaguanidina Valma • Felidiarix (veterinary use)

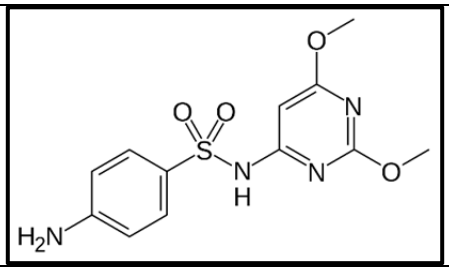
Name	Phthalylsulphathiazole
Synonym	• Phthalylsulfathiazole • Sulfathalidine • Phthalozol • Sulphaphthalyl
IUPAC Name	2-[[4-(1,3-thiazol-2-ylsulfamoyl)phenyl]carbamoyl]benzoic acid
Chemical Structure	
Uses	• It is a broad spectrum antibiotic used in the treatment of intestinal infections like bacillus dysentery. • It is also used to treat colitis, gastroenteritis, dysentery and is given before bowel surgery.
Physicochemical	• **Melting point :** 273 □C • **Water solubility:** 0.0171 mg/mL

properties	• **Lipophilicity (Log P):** 2.22 • **Dissociation constant (pKa):** -4.4 • **Molecular weight:** 403.4 g/mol
Mechanism of Action	• It is a sulfonamide derivative that acts by inhibiting the bacterial enzyme, dihydropteroate synthase. • This in turn inhibits the synthesis of dihydrofolic acid and alters the synthesis of purine and pyrimidine. Thereby it produces a bacteriostatic effect.
Stability and storage condition	• Stable under normal conditions but undergoes thermal decomposition when exposed to direct heat. It is incompatible with strong oxidizing agents. • Store in a cool, dry and tightly-closed container. It should be kept away from direct light.
Pharmaceutical formulations	• Tablets • Capsules
Brand name	• Imecol • Vagomycin • Tridyn • Ensal • Enteran • Phthalazol-Darnista

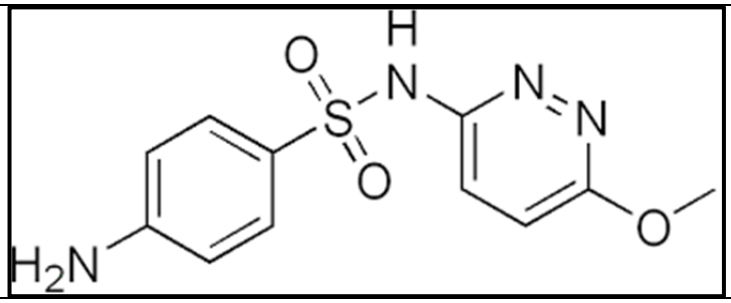
Name	Succinylsulphathiazole
Synonym	• Sulfasuccinil • Sulfasuccithiazole • Succinylsulfathiazole
IUPAC Name	4-oxo-4-[4-(1,3-thiazol-2-ylsulfamoyl)anilino]butanoic acid
Chemical Structure	

Uses	• It is used in the preoperative preparation of the large bowel and also used as an antibacterial for intestinal infections.
Physicochemical properties	• **Melting point :** 193.5 □C • **Water solubility:** 0.185mg/mL • **Lipophilicity (Log P):** 0.99 • **Dissociation constant (pKa):** 3.36 • **Molecular weight:** 355.4 g/mol
Mechanism of Action	• It is a sulfonamide derivative that acts by inhibiting the bacterial enzyme, dihydropteroate synthase. • This in turn inhibits the synthesis of dihydrofolic acid and alters the synthesis of purine and pyrimidine. • Through this way, it disrupts the DNA synthesis of the bacteria to produce a bacteriostatic effect.
Stability and storage condition	• Stable under normal conditions but undergoes thermal decomposition when exposed to direct heat. It is incompatible with strong oxidizing agents. • Store in a cool, dry and tightly-closed container. It should be kept away from direct light and stored at room temperature.
Pharmaceutical formulations	• Tablets • Powder
Brand name	• Guanicar • Cremosuxidine • Kaoxidine • Sulfasuccidine • Thiacyl • Sulfadigesin

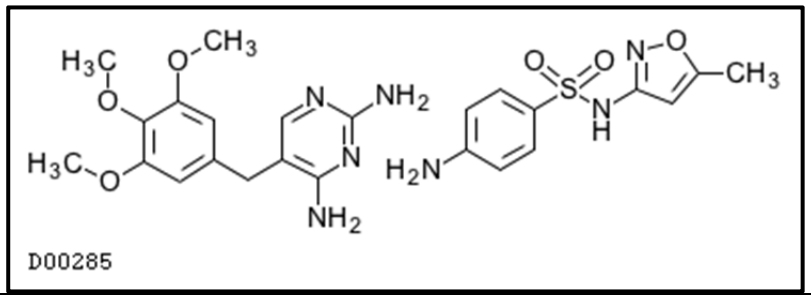
Name	Sulphadimethoxine
Synonym	• Sulfadimethoxine sodium • Sodium sulfadimethoxine

IUPAC Name	4-amino-*N*-(2,6-dimethoxypyrimidin-4-yl)benzenesulfonamide
Chemical Structure	
Uses	• It is used as an antibiotic to treat urinary tract, respiratory, soft tissue and enteric infections. • It is widely used as a veterinary medicine but is also used in humans in some countries like Russia. • Bovine respiratory disease, bacterial pneumonia, necrotic pododermatitis and calf diphtheria are some of the diseases that are treated by sulfadimethoxine.
Physicochemical properties	• **Melting point :** 203.5 □C • **Water solubility:** 0.278 mg/mL • **Lipophilicity (Log P):** 1.63 • **Dissociation constant (pKa):** 6.91 • **Molecular weight:** 310.33 g/mol
Mechanism of Action	• It is a sulfonamide antibiotic that acts by inhibiting the binding of p-amino benzoic acid to dihyropteroate synthase. • In this way, it prevents the synthesis of folic acid and interferes with the bacterial DNA synthesis.
Stability and storage condition	• Stable under normal conditions but undergoes thermal decomposition when exposed to direct heat. It is incompatible with strong oxidizing agents. • Store in a cool, dry and tightly-closed container. It should be kept away from direct light and stored at room temperature.
Pharmaceutical formulations	• Oral solution • Soluble powder • Tablet • Injection • Bolus • Sustained release formulation

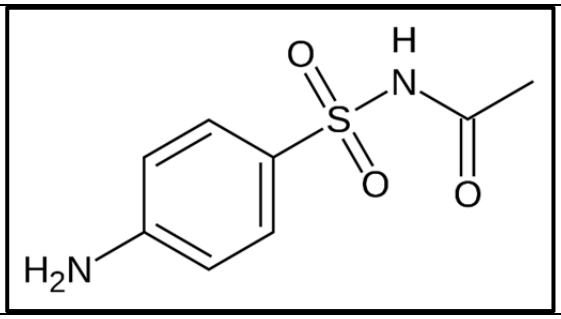
Brand name	• Di-methox • Albon • Agribon • Diasulfyl • Bactrovet

Name	Sulphamethoxypyridazine
Synonym	• Sulfapyridazine • Sulfalex • Longin • Midicel
IUPAC Name	4-amino-*N*-(6-methoxypyridazin-3-yl)benzenesulfonamide
Chemical Structure	
Uses	• It is a sulfonamide antibacterial that is used in the treatment of severe acute thrush and vaginal irritation. • It is also used as a substitute for dapsone in the treatment of dermatitis herpetiformis. • It is also used as a veterinary medicine for the treatment of sulfa-susceptible gram-positive and gram-negative bacterial infections.
Physicochemical properties	• **Melting point :** 182.5 □C • **Water solubility:** 0.325 mg/mL • **Lipophilicity (Log P):** 0.32 • **Dissociation constant (pKa):** 6.84 • **Molecular weight:** 280.31 g/mol
Mechanism of Action	• It is a sulfonamide antibiotic that acts by inhibiting the binding of p-amino benzoic acid to dihyropteroate synthase. • In this way, it prevents the synthesis of folic acid and interferes with the bacterial DNA synthesis.

Stability and storage condition	• Stable under normal conditions but undergoes thermal decomposition when exposed to direct heat. It is incompatible with strong oxidizing agents. • Store in a cool, dry and tightly-closed container. It should be kept away from direct light and stored at room temperature.
Pharmaceutical formulations	• Tablets • Oral suspension
Brand name	• Amphoprim • Uropac • Metasulfa • Urosima • Tandozin

Name	Co-trimoxazole
Synonym	• Trimethoprim/Sulfamethoxazole • Septra • Septrin
IUPAC Name	4-amino-*N*-(5-methyl-1,2-oxazol-3-yl)benzenesulfonamide;5-[(3,4,5-trimethoxyphenyl)methyl]pyrimidine-2,4-diamine
Chemical Structure	
Uses	• It is used for the treatment of bacterial infections of the respiratory tract, gastrointestinal tract and urinary tract. • Skin and wound infections, tuberculosis, pneumonia, meningococcal disease, toxoplasmosis and sepsis are also treated using co-trimoxazole. • It also reduces the risk of recurrence of retinochoroiditis.

Physicochemical properties	• **Melting point :** 167 □C • **Water solubility:** 0.459 mg/mL • **Lipophilicity (Log P):** 0.89 • **Dissociation constant (pKa):** -2.7 • **Molecular weight:** 543.6 g/mol
Mechanism of Action	• It is a combination of sulfamethoxazole and trimethoprim. This combination exhibits a synergistic effect. • Sulfamethoxazole,a sulfonamide inhibits the synthesis of dihydropteroic acid by competitive inhibition of p-amino benzoic acid. This in turn prevents the formation of dihydrofolic acid. • Trimethoprim, inhibits the dihydrofolate reductase enzyme and prevents the formation of tetrahydrofolic acid. • Both these steps are essential in the synthesis of purines and pyrimidines and hence by disrupting them, co-trimoxazole inhibits bacterial replication and produces a bactericidal effect.
Stability and storage condition	• Stable under normal conditions but undergoes thermal decomposition when exposed to direct heat. It is incompatible with strong oxidizing agents. • Store in a cool, dry and tightly-closed container. It should be kept away from direct light and stored at room temperature. • Solutions and parenteral forms of co-trimoxazole must be kept in refrigerator (~20 □C).
Pharmaceutical formulations	• Tablet • Intravenous injection • Solution • Suspension • Powder
Brand name	• Trimosulfa • Bactrim • Sulprim • Oriprim • Eusaprim

Name	Sulfacetamide
Synonym	• Acetosulfamine • Acetocid • Sulfacet • Sulfacyl • Albamine
IUPAC Name	*N*-(4-aminophenyl)sulfonylacetamide
Chemical Structure	
Uses	• It is a broad spectrum antibiotic used in the treatment of acne rosacea, conjunctivitis and seborrheic dermatitis. • It also shows anti-inflammatory properties and is used as a therapeutic in the treatment of papulopustular rosacea and perioral dermatitis.
Physicochemical properties	• **Melting point :** 183 □C • **Water solubility:** 4.21 mg/mL • **Lipophilicity (Log P):** -0.96 • **Dissociation constant (pKa):** 4.3 • **Molecular weight:** 214.24 g/mol
Mechanism of Action	• It is a sulfanylacetamide derivative that acts by inhibiting the binding of p-amino benzoic acid to dihyropteroate synthase. • In this way, it prevents the synthesis of folic acid and interferes with the bacterial DNA synthesis. • This results in the bacteriostatic action that is enhanced when used in combination with sulfur.
Stability and storage condition	• Stable under normal conditions but undergoes thermal decomposition when exposed to direct heat. It is incompatible with strong oxidizing agents. • Store in a cool, dry and tightly-closed container. It should be kept away from direct light and stored at room temperature.

Pharmaceutical formulations	• Solution/drops • Ointment • Liquid • Lotion • Aerosol (foam) • Emulsion • Suspension/drops • Gel • Shampoo • Vaginal cream
Brand name	• Isopto Cetamide • Klaron • Cetamide • Blephamide • Basulph ophthalmic liquid • Cetazin