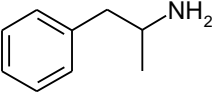
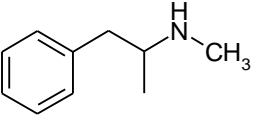
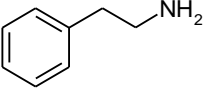
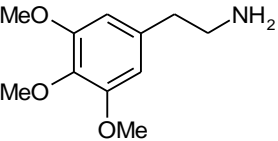
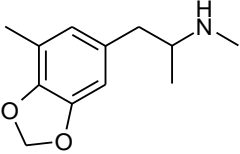
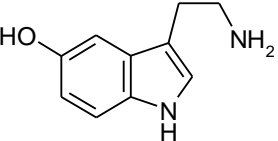
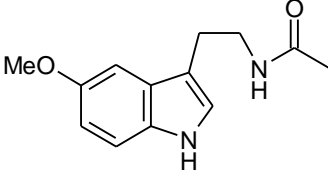
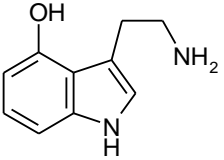
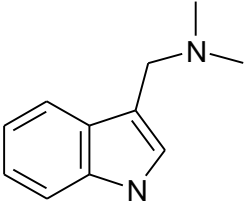
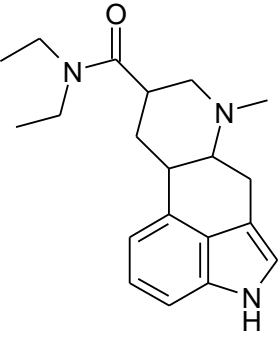
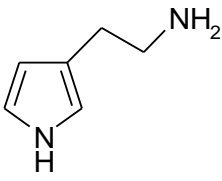
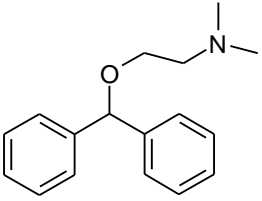
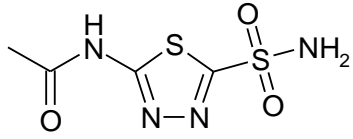
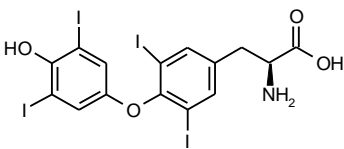


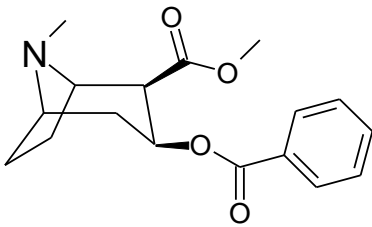
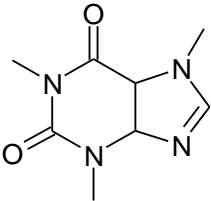
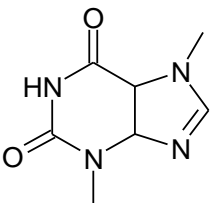
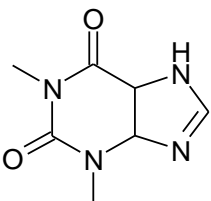
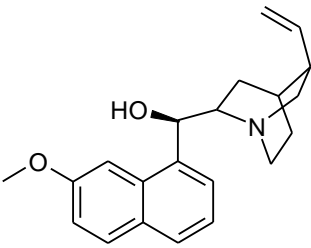
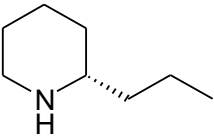
Chapter 25: Amines

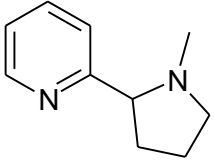
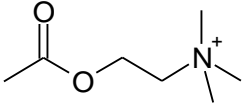
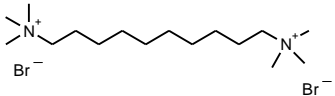
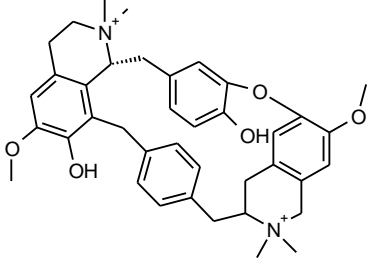
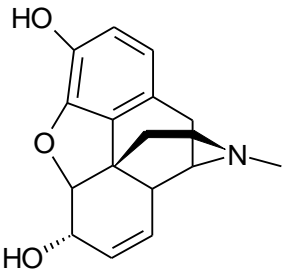
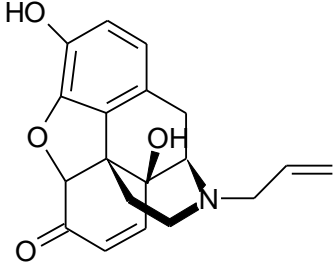
NEUROTRANSMITTERS, HORMONES, DRUGS, and ALKALOIDS

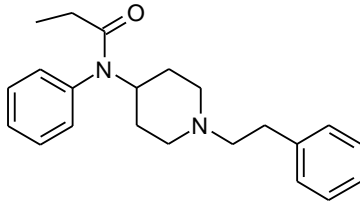
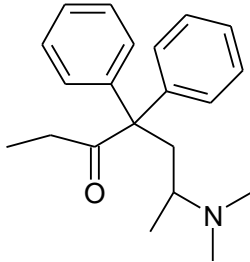
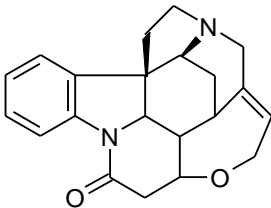
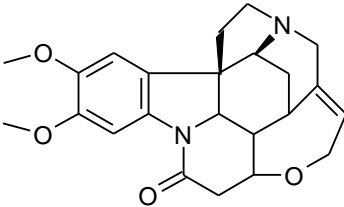
Common Name	"IUPAC" Name	Line Structure	Comments
glycine	aminoacetate		inhibitory neurotransmitter in spinal tract; antagonized by strychnine and brucine. and yes, it's one of the 20 common amino acids!
glutamate	2-amino pentanedioate		neurotransmitter many people are sensitive to MSG added to foods; it's also one of the 20 common amino acids!
γ -aminobutyric acid GABA	3-aminobutanoate		neurotransmitter and antihypertensive drug
dopamine	2-(3,4-dihydroxy phenyl) ethanamine		neurotransmitter involved in CNS control of muscle movement; deficient in Parkinson's disease
L-DOPA	L-3,4-dihydroxy phenylalanine		biosynthetic precursor to dopamine, norepinephrine, epinephrine, and melanin. Used as a drug to treat Parkinson's disease.
norepinephrine or noradrenaline	1-(3,4-dihydroxy phenyl) -2-amino ethanol		postganglionic neurotransmitter in the sympathetic nervous system, also a CNS neurotransmitter. Also a hormone produced by the adrenal medulla, elevates blood glucose levels by stimulating glycogen breakdown in the liver. Also stimulates fat breakdown in adipose tissue and affects heart rate.
epinephrine or adrenaline	N-methyl-1-(3,4-dihydroxyphenyl) -2-amino ethanol		"fight or flight" hormone produced in adrenal medulla; powerful cardiac stimulant, bronchodilator, peripheral vasoconstrictor

amphetamine	1-amino-2-phenyl propane		sympathomimetic, CNS stimulant, depresses appetite; drug of abuse
methamphetamine	1-methylamino-2-phenyl propane		sympathomimetic, CNS stimulant, depresses appetite; major drug of abuse, closely linked to psychotic and violent behavior.
phenethylamine	1-amino-2-phenyl ethane		it's the "love drug" found in chocolate
mescaline	2-(3,4,5-trimethoxy phenyl)-ethanamine		hallucinogen; the active ingredient in peyote;
MMDA "Ecstasy"	5-methyl-3,4-methylenedioxy methamphetamine		highly problematic illegal hallucinogenic drug
serotonin	2-(5-hydroxy-3-indolyl)-1-amino ethane 5-hydroxytryptamine		neurotransmitter and hormone
melatonin	N-acetyl serotonin		hormone produced by pineal gland; affects sleep and other behavior.
psilocybin	4-hydroxytryptamine		hallucinogenic drug from "shrooms"

DMT	N,N-dimethyltryptamine		a fast- and short-acting hallucinogen and psychotogen used in the '60s
LSD-25	lysergic acid N,N-diethylamide		serotonin antagonist and incredibly potent hallucinogen – as little as 125 µg causes profound hallucinations that last for many hours. Note the indole ring with an N two carbons away from the 3-position.
histamine	1-amino-2-(5-imidazolyl) ethane		produced by mast cells; powerful vasodilator; involved in allergic reactions
diphenhydramine Benadryl®	C ₁₇ H ₂₁ NO		antihistamine, used to treat allergies and motion sickness
acetazolamide Diamox®	xxx		inhibits renal carbonic anhydrase and acts as diuretic
thyroxine T4	xxx		a thyroid hormone; stimulates metabolism

cocaine			local anesthetic and drug of serious abuse
caffeine	1,3,7-trimethyl xanthine		stimulant from coffee, tea, guarana, kola nuts, and other plants
theobromine	3,7-dimethyl xanthine		found in cacao, tea, and kola nuts; used as bronchodilator, diuretic, and cardiac stimulant
theophylline	1,3-dimethyl xanthine		found in tea; has diuretic, bronchodilator, and cardiac stimulant activities
quinine	xxx		antimalarial from bark of cinchona tree
coniine	xxx		the poison in hemlock [remember Socrates?]

nicotine	xxx		from tobacco; claimed to be more addictive than heroin. partial antagonist to acetylcholine at neuromuscular junction [hence, the term “nicotinic” receptors]
acetylcholine	xxx		neurotransmitter in CNS and peripherally [parasympathetic, preganglionic sympathetic, and neuromuscular junction]
decamethonium	<i>N,N,N,N',N',N'</i> -hexamethyl-1,10-decanediaminium dibromide		skeletal muscle relaxant used in surgery
tubocurarine	$[C_{39}H_{46}N_2O_5]^{2+}$		
morphine	$C_{17}H_{19}NO_3$		powerful and addictive analgesic from the opium poppy
naloxone	$C_{19}H_{21}NO_4$		potent receptor-blocking antagonist of morphine and other opiates. Used in diagnosis and treatment of opiate overdose and addiction.

<p>fentanyl</p>	<p>$C_{22}H_{28}N_2O$</p>		<p>synthetic narcotic analgesic with high addiction potential</p>
<p>methadone</p>	<p>$C_{21}H_{27}NO$</p>		<p>another synthetic and highly addictive narcotic. Used to “treat” heroin addicts, it leaves them addicted to it instead and causes physical damage to the body.</p>
<p>strychnine</p>	<p>$C_{21}H_{22}N_2O_2$</p>		<p>incredibly toxic alkaloid from <i>Nux vomica</i> – as little as 1 mg can be fatal</p>
<p>brucine</p>	<p>$C_{23}H_{26}N_2O_4$</p>		<p>about $\frac{1}{3}$ as toxic as strychnine. In the movie <i>The Mechanic</i>, this is what the young apprentice hitman Jan-Michael Vincent used to kill his mentor Charles Bronson once he felt ready to take over the action.</p>

Molecular structures drawn by Ron Rinehart