

A Periodic Table of Monosaccharides

The table is organized into columns based on functional groups: Aldoses, Ketoses, Amino Sugars, Uronic Acids, and Deoxy Sugars. Rows represent the number of carbon atoms, from trioses (3C) at the top to decoses (10C) at the bottom. Each cell contains the name of the monosaccharide, its symbol (e.g., Glc, Fru), its chemical formula (e.g., C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>), and its molecular mass (e.g., 180.156).

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### Description

It is important to recognize the great diversity of monosaccharides commonly encountered in animals, plants, and microbes, as well as to organize them in a visually interesting style that also emphasizes their similarities and relatedness. This article discusses the nature of building blocks, monosaccharides, and monosaccharide derivatives – terms commonly used in discussing ‘glycomolecules’ found in nature. To aid in awareness of monosaccharide diversity here is presented a Periodic Table of Monosaccharides. The rationale is given for the construction of the Table and the selection of 104 monosaccharides, which is largely based on those presented in the KEGG and SNFG websites of monosaccharides and includes room to enlarge as new discoveries are made. The Table should have educational value and is intended to capture the attention and foster the imagination of those unfamiliar with glycosciences and encourage researchers to delve deeper into this fascinating area.

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	Aldoses			Ketoses		Aminosugars						Uronic Acids				
triose	Glyceraldehyde			Dihydroxyacetone												
	Gly C <sub>3</sub> H <sub>6</sub> O <sub>3</sub> 90.06			DHA C <sub>3</sub> H <sub>6</sub> O <sub>3</sub> 90.06												
tetrose	Threose		Erythrose	Erythrulose												
	Thr C <sub>4</sub> H <sub>8</sub> O <sub>4</sub> 126.10		Ery C <sub>4</sub> H <sub>8</sub> O <sub>4</sub> 126.10	Eru C <sub>4</sub> H <sub>8</sub> O <sub>4</sub> 126.10												
pentose	Ribose	Xylose	Eltose	Ribulose	Xylulose											
	Rib C <sub>5</sub> H <sub>10</sub> O <sub>5</sub> 150.13	Xyl C <sub>5</sub> H <sub>10</sub> O <sub>5</sub> 150.13	Eib C <sub>5</sub> H <sub>10</sub> O <sub>5</sub> 150.13	Ribu C <sub>5</sub> H <sub>10</sub> O <sub>5</sub> 150.13	Xyлу C <sub>5</sub> H <sub>10</sub> O <sub>5</sub> 150.13											
	Arabinose	Lyxose	Apiose													
	Ara C <sub>5</sub> H <sub>10</sub> O <sub>5</sub> 150.13	Lyx C <sub>5</sub> H <sub>10</sub> O <sub>5</sub> 150.13	Api C <sub>5</sub> H <sub>10</sub> O <sub>5</sub> 150.13													
hexose	Glucose	Galactose	Mannose	Fructose	Psicose	Glucosamine	Galactosamine	Mannosamine	Bacillosamine	Desosamine	Allosamine	Glucuronic acid	Iduronic acid	Mannuronic acid	N-Acetyl-6-deoxy-L-altrosamine	
	Glc C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> 180.16	Gal C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> 180.16	Man C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> 180.16	Fru C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> 180.16	Psi C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> 180.16	GlcN C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 179.17	GalN C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 179.17	ManN C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 179.17	Bac C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 182.19	Des C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 175.23	AlIN C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 179.17	GlcA C <sub>6</sub> H <sub>10</sub> O <sub>7</sub> 194.14	IdoA C <sub>6</sub> H <sub>10</sub> O <sub>7</sub> 194.14	ManA C <sub>6</sub> H <sub>10</sub> O <sub>7</sub> 194.14	L6dAltNAC C <sub>6</sub> H <sub>13</sub> NO <sub>6</sub> 205.21	
	Altrose	Alliose	Idiose	Tagitose	Sorbose	Idosamine	Altrosamine	Talosamine	Gulosamine	Muramic acid	N-Acetyl-fucosamine	L-Altrosuronic acid	Guluronic acid	Fructuronic acid	N-Acetyl-6-deoxy-D-talosamine	
	Alt C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> 180.16	All C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> 180.16	Ido C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> 180.16	Tag C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> 180.16	Sor C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> 180.16	IdoN C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 179.17	AltN C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 179.17	TalN C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 179.17	GulN C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 179.17	Mur C <sub>6</sub> H <sub>13</sub> NO <sub>6</sub> 201.23	FucNAC C <sub>6</sub> H <sub>13</sub> NO <sub>6</sub> 205.21	LAltA C <sub>6</sub> H <sub>10</sub> O <sub>7</sub> 194.14	GulA C <sub>6</sub> H <sub>10</sub> O <sub>7</sub> 194.14	FruA C <sub>6</sub> H <sub>10</sub> O <sub>7</sub> 194.14	6dTalNAC C <sub>6</sub> H <sub>13</sub> NO <sub>6</sub> 205.21	
	Gulose	Talose				N-Acetyl-glucosamine	N-Acetyl-galactosamine	N-Acetyl-mannosamine	N-Acetyl-quinosamine	N-Acetyl-flamosamine	N-Acetyl-alamosamine	Talonic acid	Galacturonic acid	Aluronic acid		
Gul C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> 180.16	Tal C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> 180.16				GlcNAC C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 221.21	GalNAC C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 221.21	ManNAC C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 221.21	QuiNAC C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 221.21	RhaNAC C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 221.21	AllNAC C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 221.21	TalA C <sub>6</sub> H <sub>10</sub> O <sub>7</sub> 194.14	GalA C <sub>6</sub> H <sub>10</sub> O <sub>7</sub> 194.14	AllA C <sub>6</sub> H <sub>10</sub> O <sub>7</sub> 194.14			
					N-Acetyl-altrosamine	N-Acetyl-gulosamine	N-Acetyl-talosamine	N-Acetyl-quinosamine	N-Acetyl-muramic acid	N-Glycosyl-muramic acid	4-O-Methyl-D-glucuronic acid					
					LaltNAC C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 221.21	GulNAC C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 221.21	LidoNAC C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 221.21	TalNAC C <sub>6</sub> H <sub>13</sub> NO <sub>5</sub> 221.21	MurNAC C <sub>6</sub> H <sub>13</sub> NO <sub>6</sub> 205.27	MurNGc C <sub>6</sub> H <sub>13</sub> NO <sub>6</sub> 209.27	meGlcA C <sub>6</sub> H <sub>10</sub> O <sub>7</sub> 208.17					
heptose	D or L-Glycero-D-manno-Heptose			Sedoheptulose	Mannoheptulose											
	ManHep C <sub>7</sub> H <sub>14</sub> O <sub>7</sub> 216.18			Sed C <sub>7</sub> H <sub>14</sub> O <sub>7</sub> 216.18	ManH C <sub>7</sub> H <sub>14</sub> O <sub>7</sub> 216.18											
						D-erythro-L-galacto-Octose		3-Deoxy-D-manno-2-octulosonic acid	Erimiose	Methylthioinosanediol						
						Oct C <sub>8</sub> H <sub>16</sub> O <sub>8</sub> 240.21		Kdo C <sub>8</sub> H <sub>16</sub> O <sub>8</sub> 238.19	Erw C <sub>8</sub> H <sub>16</sub> O <sub>8</sub> 236.26	Mtl C <sub>8</sub> H <sub>16</sub> NO <sub>8</sub> 253.32						