

PERIOD ↓	METALS																	
	I A		II A		III B		IV B		V B		VI B		VII B		VIII			
	1	g	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
1	1 H 1.00794 ^a 1 Hydrogen																	
2	2 1 3 Li 6.94 ^{a,b,c} 1 Lithium		2 2 4 Be 9.012182 2 Beryllium															
3	2 8 1 11 Na 22.989768 1 Sodium		2 8 2 12 Mg 24.305 ^b 2 Magnesium															
4	2 8 8 1 19 K 39.098 ₁ 1 Potassium		2 8 8 2 20 Ca 40.078 ^b 2 Calcium		2 8 9 2 21 Sc 44.95591 3 Scandium		2 8 10 2 22 Ti 47.88 2, 3, 4 Titanium		2 8 11 2 23 V 50.9415 2, 3, 4, 5 Vanadium		2 8 13 1 24 Cr 51.9961 2, 3, 6 Chromium		2 8 13 2 25 Mn 54.93805 2, 3, 4, 6, 7 Manganese		2 8 14 2 26 Fe 55.84 ₂ 2, 3 Iron		2 8 15 2 27 Co 58.9332 2, 3 Cobalt	
5	2 8 18 8 1 37 Rb 85.467 ^b 1 Rubidium		2 8 18 8 2 38 Sr 87.62 ^b 2 Strontium		2 8 18 9 2 39 Y 88.90585 3 Yttrium		2 8 18 10 2 40 Zr 91.224 ^b 4 Zirconium		2 8 18 12 1 41 Nb 92.90638 3, 5 Niobium		2 8 18 13 1 42 Mo 95.94 2, 3, 4, 5, 6 Molybdenum		2 8 18 13 2 43 Tc (97.9072) 6, 7 Technetium		2 8 18 15 1 44 Ru 101.07 ^b 2, 3, 4, 6, 8 Ruthenium		2 8 18 16 1 45 Rh 102.9055 2, 3, 4 Rhodium	
6	2 8 18 18 8 1 55 Cs 132.90543 1 Cesium		2 8 18 18 8 2 56 Ba 137.327 ^b 2 Barium		2 8 32 10 2 57-71 See Lanthanide Series Lanthanum		2 8 18 32 10 2 72 Hf 178.4 ₂ 4 Hafnium		2 8 18 32 11 2 73 Ta 180.947 ₉ 5 Tantalum		2 8 18 32 12 2 74 W 183.8 ₅ 2, 3, 4, 5, 6 Tungsten		2 8 18 32 13 2 75 Re 186.207 3, 4, 5, 6, 7 Rhenium		2 8 18 32 14 2 76 Os 190.2 ^b 2, 3, 4, 6, 8 Osmium		2 8 18 32 17 77 Ir 192.2 ₂ 2, 3, 4 Iridium	
7	2 8 18 32 18 8 1 87 Fr (223.0197) 1 Francium		2 8 18 32 18 8 2 88 Ra 226.0254 ^{b,d} 2 Radium		89-103 See Actinide Series Actinium		104 (Unq) (261.11) (Unnilquadium) [§]		105 (Unp) (262.114) (Unnilpentium) [§]		106 (Unh) (263.118) (Unnilhexium) [§]		107 Uns (262.12) (Unnilseptium) [§]					

KEY

Electron population of orbits

K
L
M
N
O
P
Q

At No
Symbol
At Wt
Valence
Name

State at 30°C if other than solid:
g = gas; l = liquid

Outline letters represent elements known only through synthesis.

On the scale ¹²C = 12*

Characteristic values

Lanthanide Series (Rare Earth Elements)	2 8 18 18 9 2 57 La 138.905 ^b 3 Lanthanum	2 8 18 19 9 2 58 Ce 140.115 ^b 3, 4 Cerium	2 8 18 20 8 2 59 Pr 140.90765 3, 4 Praseodymium	2 8 18 22 8 2 60 Nd 144.2 ^b 3 Neodymium	2 8 18 23 8 2 61 Pm (144.9127) 3 Promethium	2 8 18 24 8 2 62 Sm 150.36 2, 3 Samarium	2 8 18 25 8 2 63 Eu 151.965 ^b 2, 3 Europium
	Actinide Series	2 8 18 32 18 9 2 89 Ac 227.0278 ^d 3 Actinium	2 8 18 32 19 9 2 90 Th 232.0381 ^{b,d} 4 Thorium	2 8 18 20 9 2 91 Pa 231.0359 ^d 5 Protactinium	2 8 18 32 21 9 2 92 U 238.0289 ^{b,c} 3, 4, 5, 6 Uranium	2 8 18 32 22 9 2 93 Np 237.0482 ^d 3, 4, 5, 6 Neptunium	2 8 18 32 23 9 2 94 Pu (244.0642) 3, 4, 5, 6 Plutonium

* Atomic weight is an alternative term for 'relative atomic mass of an element', $A_r(E)$. The IUPAC values given here are scaled to $A_r(^{12}\text{C}) = 12$ and apply to elements as they exist in materials of terrestrial origin and to certain artificial elements. When used with due regard to the footnotes they are considered reliable to ± 1 in the last digit or ± 3 if that digit is subscript. Values in parentheses are for radioactive elements whose atomic weights cannot be quoted precisely without knowledge of the origin of the elements; the value given is the atomic mass number of the isotope of that element of longest known half-life.

† Beginning with Group III, authors differ in their presentation of the "A" and "B" groups of elements.

‡ Expected value from theoretical considerations. § Names and symbols provisionally suggested by IUPAC.

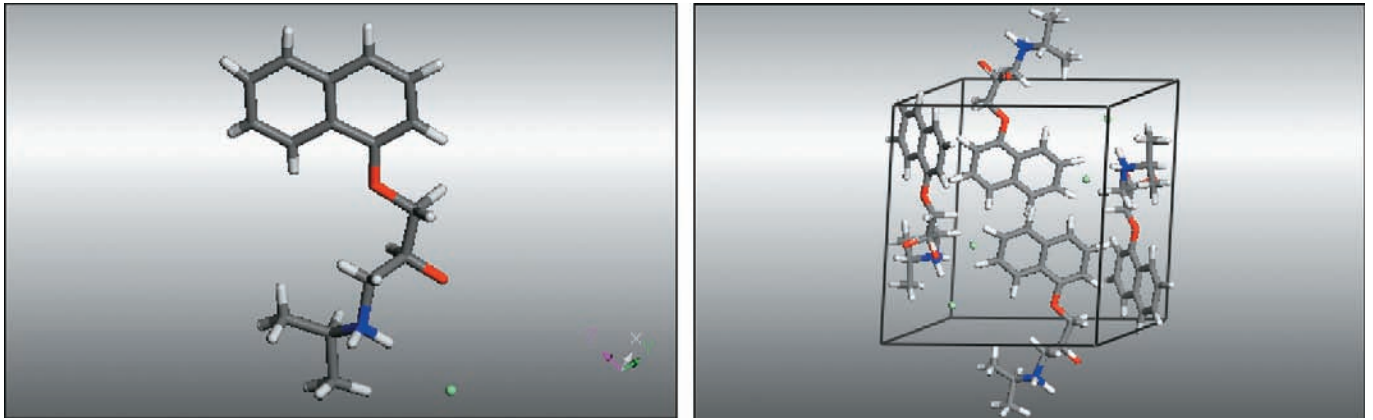
NON-METALS																INERT GASES												
														VII A		ZERO												
														1	g	2	g											
														1 H 1.00794 ^a -1 Hydrogen		2 He 4.002602 ^b 0 Helium												
III A				IV A				V A				VI A																
2 3	5 B 10.811 ^{a,c} 3 Boron		2 4	6 C 12.011 ^a -4; 2, 4 Carbon		2 5	7 N 14.00674 -3; 3, 5 Nitrogen		2 6	8 O 15.999 ^a -2 Oxygen		2 7	9 F 18.9984032 -1 Fluorine		2 8	10 Ne 20.1797 ^c 0 Neon												
2 8 3	13 Al 26.981539 3 Aluminum		2 8 4	14 Si 28.085 ^s -4; 4 Silicon		2 8 5	15 P 30.973762 -3; 3, 5 Phosphorus		2 8 6	16 S 32.066 ^a -2; 2, 4, 6 Sulfur		2 8 7	17 Cl 35.4527 -1; 1, 3, 5, 7 Chlorine		2 8 8	18 Ar 39.94 ^{a,b} 0 Argon												
I B		II B																										
2 8 16 2	28 Ni 58.69 2, 3 Nickel		2 8 18 1	29 Cu 63.54 ^d 1, 2 Copper		2 8 18 2	30 Zn 65.39 2 Zinc		2 8 18 3	1	2 8 18 3	31 Ga 69.723 3 Gallium		2 8 18 4	32 Ge 72.61 4 Germanium		2 8 18 5	33 As 74.92159 -3; 3, 5 Arsenic		2 8 18 6	34 Se 78.9 ^s -2; 4, 6 Selenium		2 8 18 7	35 Br 79.904 -1; 1, 3, 5, 7 Bromine		2 8 18 8	36 Kr 83.80 ^{b,c} 0 Krypton	
2 8 18 18	46 Pd 106.42 ^b 2, 4 Palladium		2 8 18 1	47 Ag 107.868 ^b 1 Silver		2 8 18 2	48 Cd 112.411 ^b 2 Cadmium		2 8 18 3	1	2 8 18 3	49 In 114.82 ^b 3 Indium		2 8 18 4	50 Sn 118.71 2, 4 Tin		2 8 18 5	51 Sb 121.7 ^s -3; 3, 5 Antimony		2 8 18 6	52 Te 127.6 ^b -2; 4, 6 Tellurium		2 8 18 7	53 I 126.90447 -1; 1, 3, 5, 7 Iodine		2 8 18 8	54 Xe 131.29 ^{b,c} 0 Xenon	
2 8 18 32 17 1	78 Pt 195.0 ^s 2, 4 Platinum		2 8 18 32 1	79 Au 196.96654 1, 3 Gold		2 8 18 32 2	80 Hg 200.5 ^s 1, 2 Mercury		2 8 18 3	1	2 8 18 3	81 Tl 204.3833 1, 3 Thallium		2 8 18 32 4	82 Pb 207.2 ^{a,b} 2, 4 Lead		2 8 18 32 5	83 Bi 208.980437 3, 5 Bismuth		2 8 18 32 6	84 Po (208.9824) 2, 4 Polonium		2 8 18 32 7	85 At (209.9871) 1, 3, 5, 7; Astatine		2 8 18 32 8	86 Rn (222.0176) 0 Radon	

2 8 18 25 9 2	64 Gd 157.2 ^{s,b} 3 Gadolinium		2 8 18 26 9 2	65 Tb 158.92534 3, 4 Terbium		2 8 18 28 8 2	66 Dy 162.5 ₀ 3 Dysprosium		2 8 18 29 8 2	67 Ho 164.93032 3 Holmium		2 8 18 30 8 2	68 Er 167.2 ₆ 3 Erbium		2 8 18 31 8 2	69 Tm 168.93421 3 Thulium		2 8 18 32 8 2	70 Yb 173.0 ₄ 2, 3 Ytterbium		2 8 18 32 9 2	71 Lu 174.96 ₇ 3 Lutetium	
2 8 18 32 25 9 2	96 Cm (247.0703) 3 Curium		2 8 18 32 26 9 2	97 Bk (247.0703) 3, 4 Berkelium		2 8 18 32 27 9 2	98 Cf (251.0796) 3 Californium		2 8 18 32 28 9 2	99 Es (252.083) 3 [†] Einsteinium		2 8 18 32 29 9 2	100 Fm (257.0951) 3 [†] Fermium		2 8 18 30 31 9 2	101 Md (258.10) 3 [†] Mendelevium		2 8 18 32 31 9 2	102 No (259.1009) 3 [†] Nobelium		2 8 18 32 32 9 2	103 Lr (262.11) 3 [†] Lawrencium	

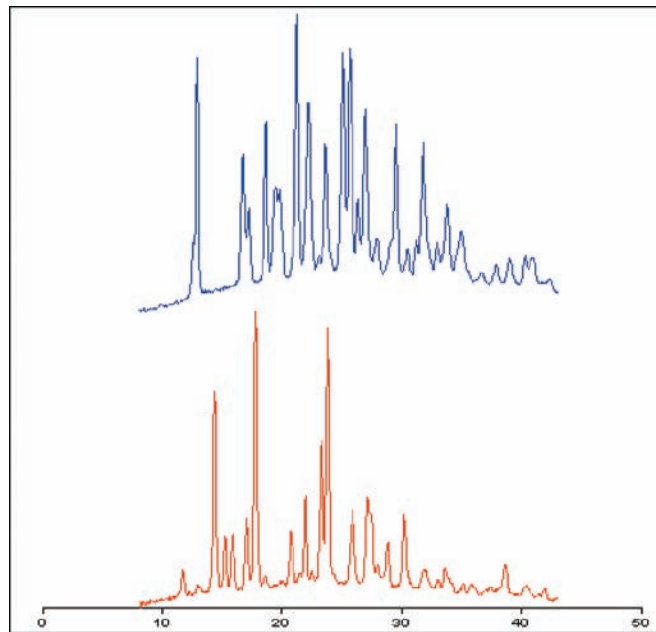
Element for which known variations in isotopic composition in normal terrestrial material prevent a more precise atomic weight being given; A_r (E) values should be applicable to any 'normal' material. ^bElement for which geological specimens are known in which the element has an anomalous isotopic composition, such that the difference between the atomic weight of the element in such specimens and that given in the table may exceed considerably the implied uncertainty. ^cElement for which substantial variations in A_r from the value given can occur in commercially available material because of inadvertent or undisclosed change of isotopic composition. ^dElement for which the value of A_r is that of the radioisotope of longest half-life.

Table of Logarithms

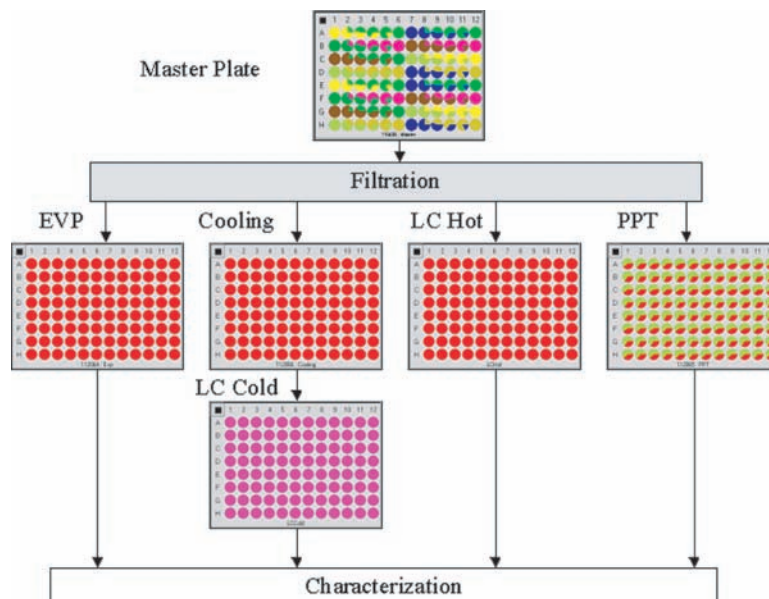
True Number	Proportional Parts										Log Number	Proportional Parts										True Number								
	0 1 2 3 4 5 6 7 8 9											0 1 2 3 4 5 6 7 8 9																		
	1	2	3	4	5	6	7	8	9			1	2	3	4	5	6	7	8	9										
10	0000	0043	0086	0128	0170	0212	0253	0294	0334	0374	55	7404	7412	7419	7427	7435	7443	7451	7459	7466	7474	1	2	3	4	5	6	7	8	9
11	0414	0453	0492	0531	0569	0607	0645	0682	0719	0755	56	7482	7490	7497	7505	7513	7520	7528	7536	7543	7551	1	2	3	4	5	6	7	8	9
12	0792	0828	0864	0899	0934	0969	1004	1038	1072	1106	57	7559	7566	7574	7582	7589	7597	7604	7612	7619	7627	1	2	3	4	5	6	7	8	9
13	1139	1173	1206	1239	1271	1303	1335	1367	1399	1430	58	7634	7642	7649	7657	7664	7672	7679	7686	7694	7701	1	2	3	4	5	6	7	8	9
14	1461	1492	1523	1553	1584	1614	1644	1673	1703	1732	59	7709	7716	7723	7731	7738	7745	7752	7760	7767	7774	1	2	3	4	5	6	7	8	9
15	1761	1790	1818	1847	1875	1903	1931	1959	1987	2014	60	7782	7789	7796	7803	7810	7818	7825	7832	7839	7846	1	2	3	4	5	6	7	8	9
16	2041	2068	2095	2122	2148	2175	2201	2227	2253	2279	61	7853	7860	7868	7875	7882	7889	7896	7903	7910	7917	1	2	3	4	5	6	7	8	9
17	2304	2330	2355	2380	2405	2430	2455	2480	2504	2529	62	7924	7931	7938	7945	7952	7959	7966	7973	7980	7987	1	2	3	4	5	6	7	8	9
18	2553	2577	2601	2625	2648	2672	2695	2718	2742	2765	63	7993	8000	8007	8014	8021	8028	8035	8041	8048	8055	1	2	3	4	5	6	7	8	9
19	2788	2810	2833	2856	2878	2900	2923	2945	2967	2989	64	8062	8069	8075	8082	8089	8096	8102	8109	8116	8122	1	2	3	4	5	6	7	8	9
20	3010	3032	3054	3075	3096	3118	3139	3160	3181	3201	65	8129	8136	8142	8149	8156	8162	8169	8176	8182	8189	1	2	3	4	5	6	7	8	9
21	3222	3243	3263	3284	3304	3324	3345	3365	3385	3404	66	8195	8202	8209	8215	8222	8228	8235	8241	8248	8254	1	2	3	4	5	6	7	8	9
22	3424	3444	3464	3483	3502	3522	3541	3560	3579	3598	67	8261	8267	8274	8280	8287	8293	8299	8306	8312	8319	1	2	3	4	5	6	7	8	9
23	3617	3636	3655	3674	3692	3711	3729	3747	3766	3784	68	8325	8331	8338	8344	8351	8357	8363	8370	8376	8382	1	2	3	4	5	6	7	8	9
24	3802	3820	3838	3856	3874	3892	3909	3927	3945	3962	69	8388	8395	8401	8407	8414	8420	8426	8432	8439	8445	1	2	3	4	5	6	7	8	9
25	3979	3997	4014	4031	4048	4065	4082	4099	4116	4133	70	8451	8457	8463	8470	8476	8482	8488	8494	8500	8506	1	2	3	4	5	6	7	8	9
26	4150	4166	4183	4200	4216	4232	4249	4265	4281	4298	71	8513	8519	8525	8531	8537	8543	8549	8555	8561	8567	1	2	3	4	5	6	7	8	9
27	4314	4330	4346	4362	4378	4393	4409	4425	4440	4456	72	8573	8579	8585	8591	8597	8603	8609	8615	8621	8627	1	2	3	4	5	6	7	8	9
28	4472	4487	4502	4518	4533	4548	4564	4579	4594	4609	73	8633	8639	8645	8651	8657	8663	8669	8675	8681	8686	1	2	3	4	5	6	7	8	9
29	4624	4639	4654	4669	4683	4698	4713	4728	4742	4757	74	8692	8698	8704	8710	8716	8722	8727	8733	8739	8745	1	2	3	4	5	6	7	8	9
30	4771	4786	4800	4814	4829	4843	4857	4871	4886	4900	75	8751	8756	8762	8768	8774	8779	8785	8791	8797	8802	1	2	3	4	5	6	7	8	9
31	4914	4928	4942	4955	4969	4983	4997	5011	5024	5038	76	8808	8814	8820	8825	8831	8837	8842	8848	8854	8859	1	2	3	4	5	6	7	8	9
32	5051	5065	5079	5092	5105	5119	5132	5145	5159	5172	77	8865	8871	8876	8882	8887	8893	8899	8904	8910	8915	1	2	3	4	5	6	7	8	9
33	5185	5198	5211	5224	5237	5250	5263	5276	5289	5302	78	8921	8927	8932	8938	8943	8949	8954	8960	8965	8971	1	2	3	4	5	6	7	8	9
34	5315	5328	5340	5353	5366	5378	5391	5403	5416	5428	79	8976	8982	8987	8993	8998	9004	9009	9015	9020	9026	1	2	3	4	5	6	7	8	9
35	5441	5453	5465	5478	5490	5502	5514	5527	5539	5551	80	9031	9036	9042	9047	9053	9058	9063	9069	9074	9079	1	2	3	4	5	6	7	8	9
36	5563	5575	5587	5599	5611	5623	5635	5647	5658	5670	81	9085	9090	9096	9101	9106	9112	9117	9122	9128	9133	1	2	3	4	5	6	7	8	9
37	5682	5694	5705	5717	5729	5740	5752	5763	5775	5786	82	9138	9143	9149	9154	9159	9165	9170	9175	9180	9186	1	2	3	4	5	6	7	8	9
38	5798	5809	5821	5832	5843	5855	5866	5877	5888	5899	83	9191	9196	9201	9206	9212	9217	9222	9227	9232	9238	1	2	3	4	5	6	7	8	9
39	5911	5922	5933	5944	5955	5966	5977	5988	5999	6010	84	9243	9248	9253	9258	9263	9269	9274	9279	9284	9289	1	2	3	4	5	6	7	8	9
40	6021	6031	6042	6053	6064	6075	6085	6096	6107	6117	85	9294	9299	9304	9309	9315	9320	9325	9330	9335	9340	1	2	3	4	5	6	7	8	9
41	6128	6138	6149	6160	6170	6180	6191	6201	6212	6222	86	9345	9350	9355	9360	9365	9370	9375	9380	9385	9390	1	2	3	4	5	6	7	8	9
42	6232	6243	6253	6263	6274	6284	6294	6304	6314	6325	87	9395	9400	9405	9410	9415	9420	9425	9430	9435	9440	1	2	3	4	5	6	7	8	9
43	6335	6345	6355	6365	6375	6385	6395	6405	6415	6425	88	9445	9450	9455	9460	9465	9470	9475	9480	9485	9490	1	2	3	4	5	6	7	8	9
44	6435	6444	6454	6464	6474	6484	6493	6503	6513	6522	89	9494	9499	9504	9509	9513	9518	9523	9528	9533	9538	1	2	3	4	5	6	7	8	9
45	6532	6542	6551	6561	6571	6580	6590	6599	6609	6618	90	9542	9547	9552	9557	9562	9566	9571	9576	9581	9586	1	2	3	4	5	6	7	8	9
46	6628	6637	6646	6656	6665	6675	6684	6693	6702	6712	91	9590	9595	9600	9605	9609	9614	9619	9624	9629	9633	1	2	3	4	5	6	7	8	9
47	6721	6730	6739	6749	6758	6767	6776	6785	6794	6803	92	9638	9643	9647	9652	9657	9661	9666	9671	9675	9680	1	2	3	4	5	6	7	8	9
48	6812	6821	6830	6839	6848	6857	6866	6875	6884	6893	93	9685	9689	9694	9699	9703	9708	9713	9717	9722	9727	1	2	3	4	5	6	7	8	9
49	6902	6911	6920	6928	6937	6946	6955	6964	6972	6981	94	9731	9736	9741	9745	9750	9754	9759	9763	9768	9773	1	2	3	4	5	6	7	8	9
50	6990	6998	7007	7016	7024	7033	7042	7050	7059	7067	95	9777	9782	9786	9791	9795	9800	9805	9809	9814	9818	1	2	3	4	5	6	7	8	9
51	7076	7084	7093	7101	7110	7118	7126	7135	7143	7152	96	9823	9827	9832	9836	9841	9845	9850	9854	9859	9863	1	2	3	4	5	6	7	8	9
52	7160	7168	7177	7185	7193	7202	7210	7218	7226	7235	97	9868	9872	9877	9881	9886	9890	9894	9899	9903	9908	1	2	3	4	5	6	7	8	9
53	7243	7251	7259	7267	7275	7284	7292	7300	7308	7316	98	9912	9917	9921	9926	9930	9934	9939	9943	9948	9952	1	2	3	4	5	6	7	8	9
54	7324	7332	7340	7348	7356	7364	7372	7380	7388	7396	99	9956	9961	9965	9969	9974	9978	9983	9987	9991	9996	1	2	3	4	5	6	7	8	9



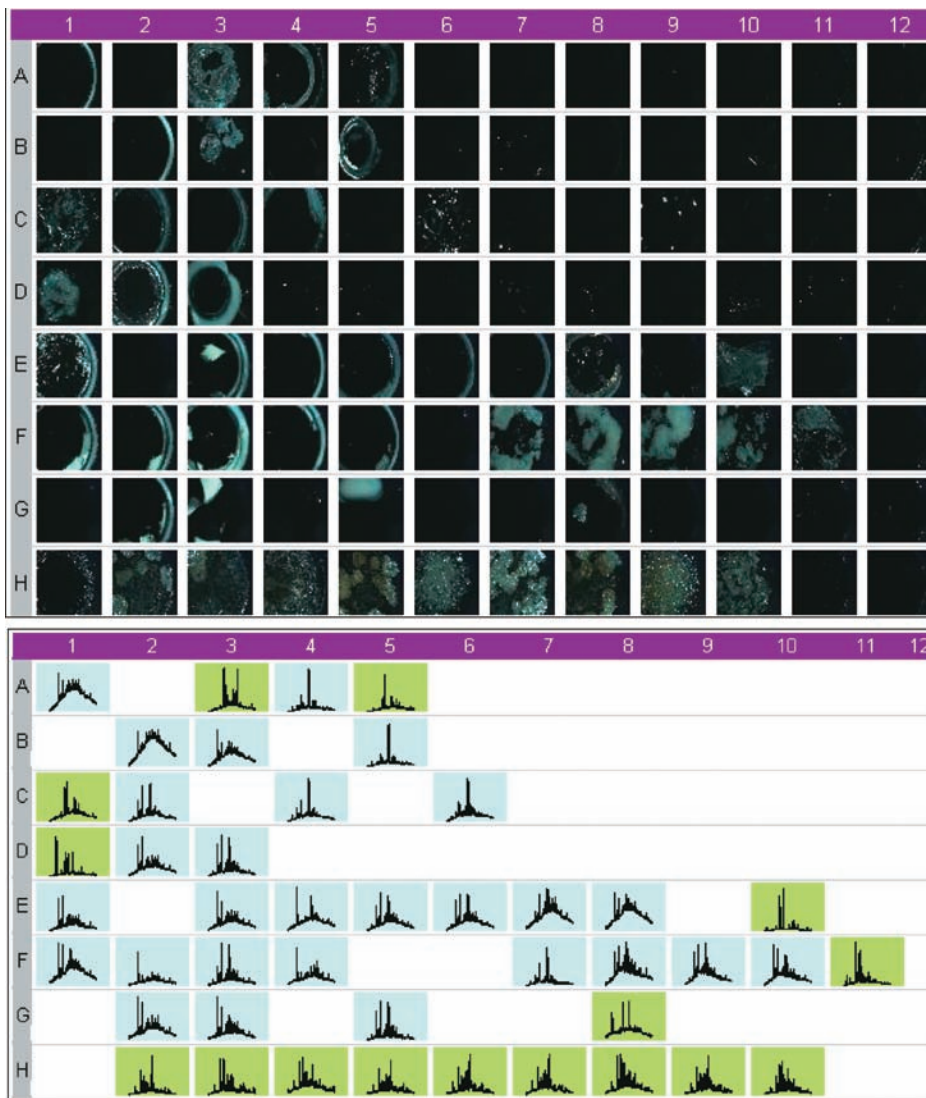
Color Plate 1. Figure 34-32. The 3-dimensional molecular structure of d,l-propranolol hydrochloride provides information about the molecular conformation and bonding whereas its packing arrangement within the crystallographic unit cell is useful in understanding the physical properties of the crystalline form.



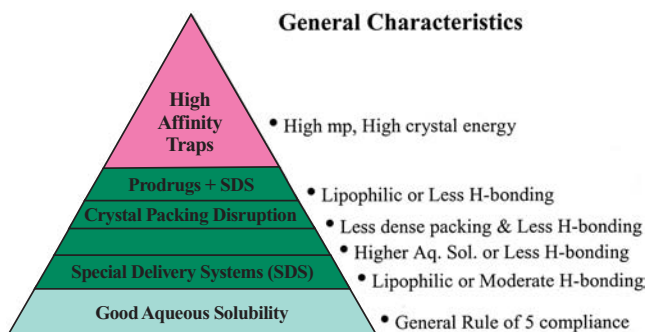
Color Plate 2. Figure 34-35. The x-ray powder diffraction patterns of two polymorphic forms of d,l-propranolol hydrochloride indicate differences in molecular arrangements within their different crystal lattices.



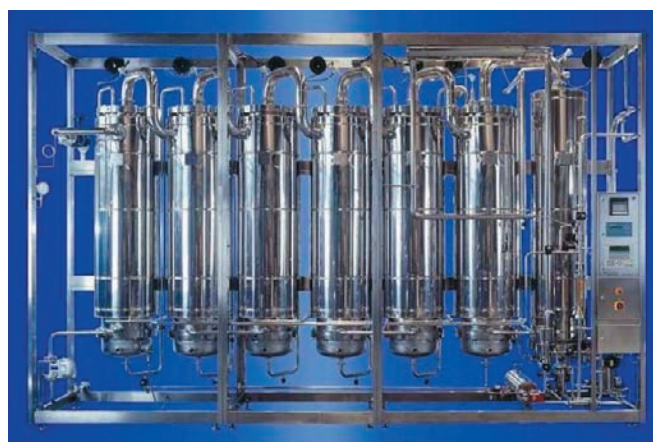
Color Plate 3. Figure 34-44. Design for the crystallization process for polymorphic form screening demonstrates hot filtration of the crystallization solution and its transfer to three crystallization plates and two plates for solubility determination.



Color Plate 4. Figure 34-45. Birefringence images and powder diffraction patterns collected from the evaporative crystallization plate in the HTS of d,l-propranolol hydrochloride indicates two polymorphic crystal forms and their location within the 96-well plate, thus enabling correlation of crystallization chemistry with the crystal form obtained.



Color Plate 5. Figure 38-7. Possible and physiological-negative drug spaces.



Color Plate 6. Figure 41-3. Multiple effect still (courtesy, Getinge).



Color Plate 7. Figure 41-10. Example of an isolator (courtesy, LaCal-hene).



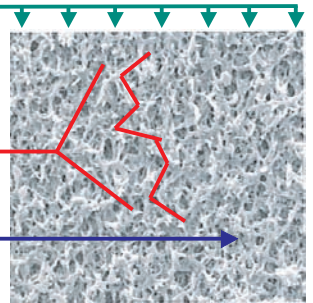
Color Plate 8. Figure 41-12. Example of a three-bucket assembly used for sanitizing facilities (courtesy, Contec).



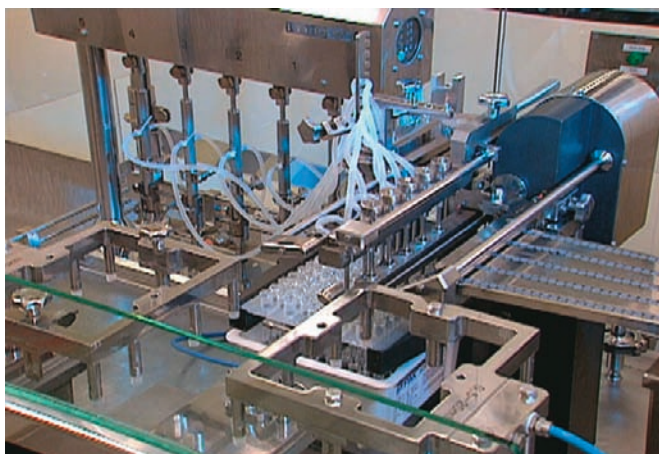
Color Plate 9. Figure 41-18. Rubber closure processors (courtesy, Getinge USA).

High flow: 65-75% porous
Particles retained by

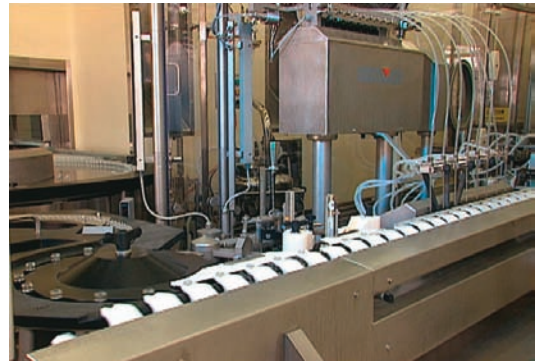
- Sieving
- Entrapment (tortuous pathway)
- Adsorption (high internal area)



Color Plate 10. Figure 41-19. Mechanisms of microbial retention on membrane filters (courtesy, Millipore).



Color Plate 11. Figure 41-21. Syringe filling machine (courtesy, Baxter).



A

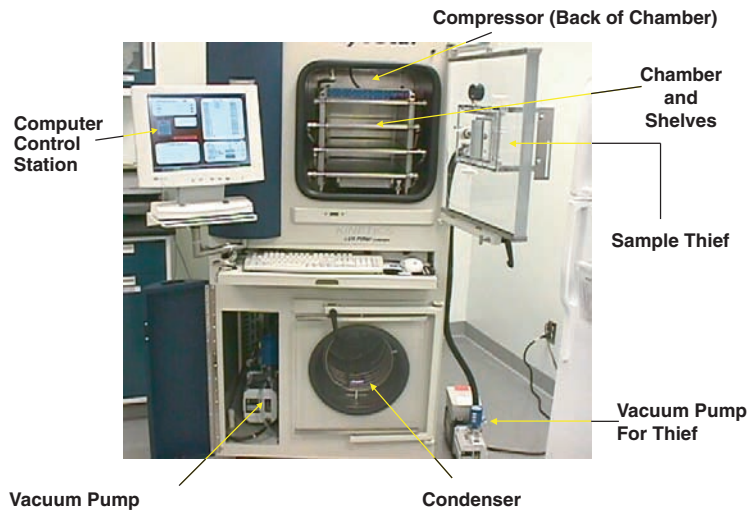


B

Color Plate 12. Figure 41-22. Vial filling machine, distant and close-up views (courtesy, Baxter).

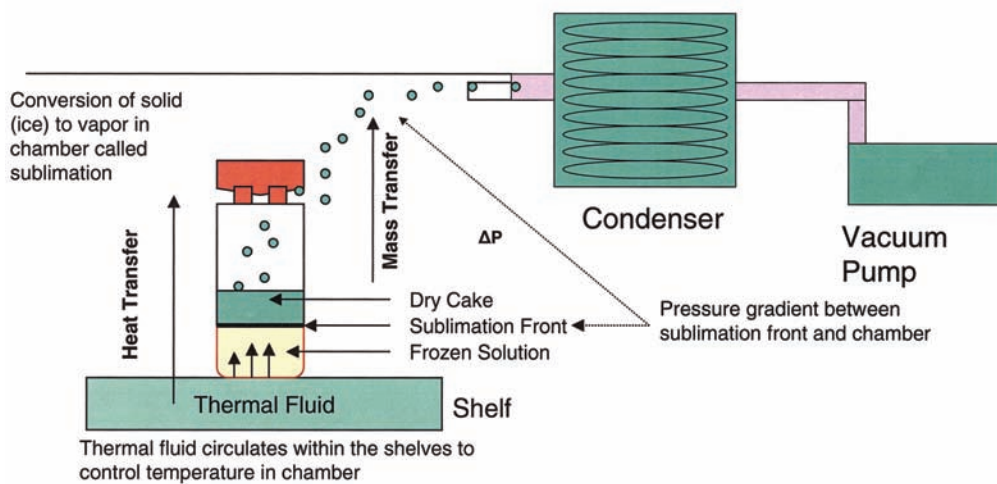


Color Plate 13. Figure 41-27. Steam sterilizers (small and large) (courtesy, Getinge).



Color Plate 14. Figure 41-28. Example of a laboratory freeze-dryer (courtesy, Baxter).

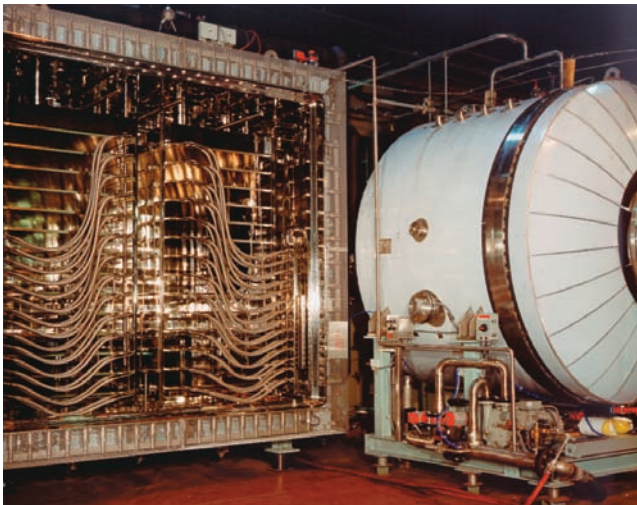
Temperature difference between chamber and condenser and pressure differential between solution in vials and vacuum pump drives ice out of vial and onto the condenser



Color Plate 15. Figure 41-29. Heat and mass transfer in the freeze-dryer.



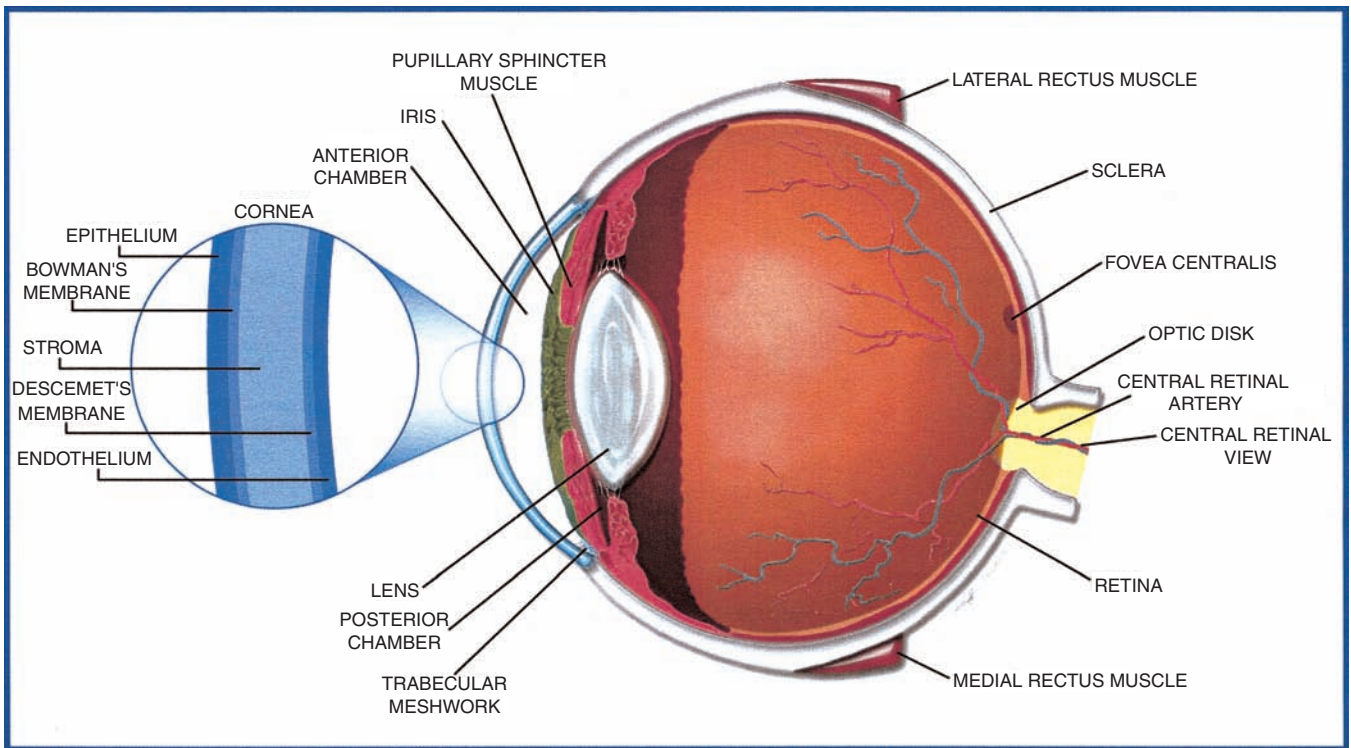
Color Plate 16. Figure 41-30. Example of a production freeze-dryer (courtesy, Edwards).



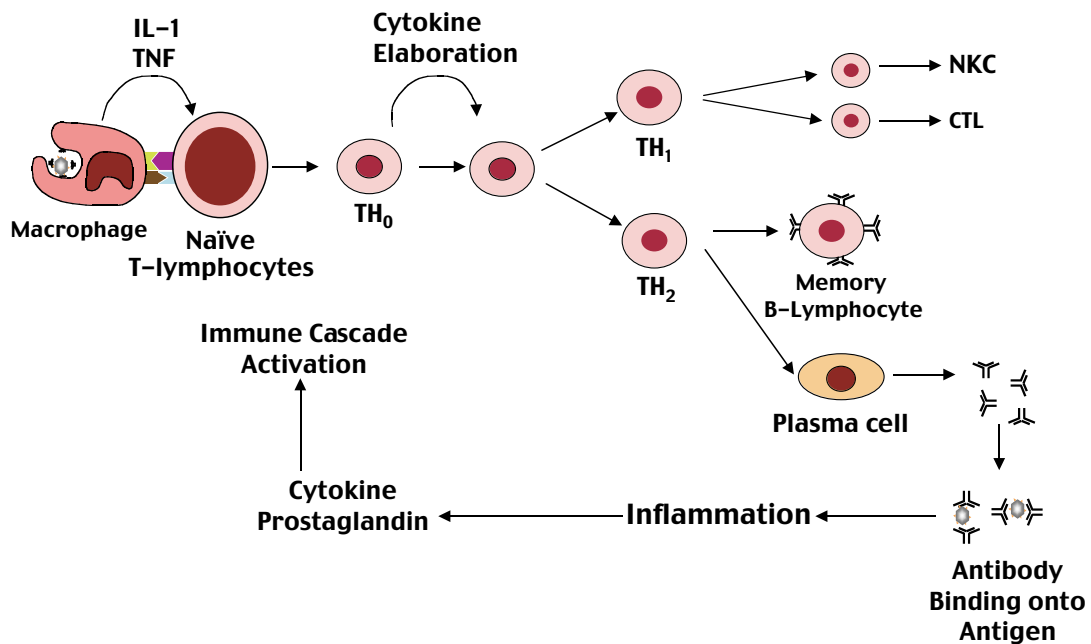
Color Plate 17. Figure 41-31. Inside view of a production freeze-dryer (courtesy, Edwards).



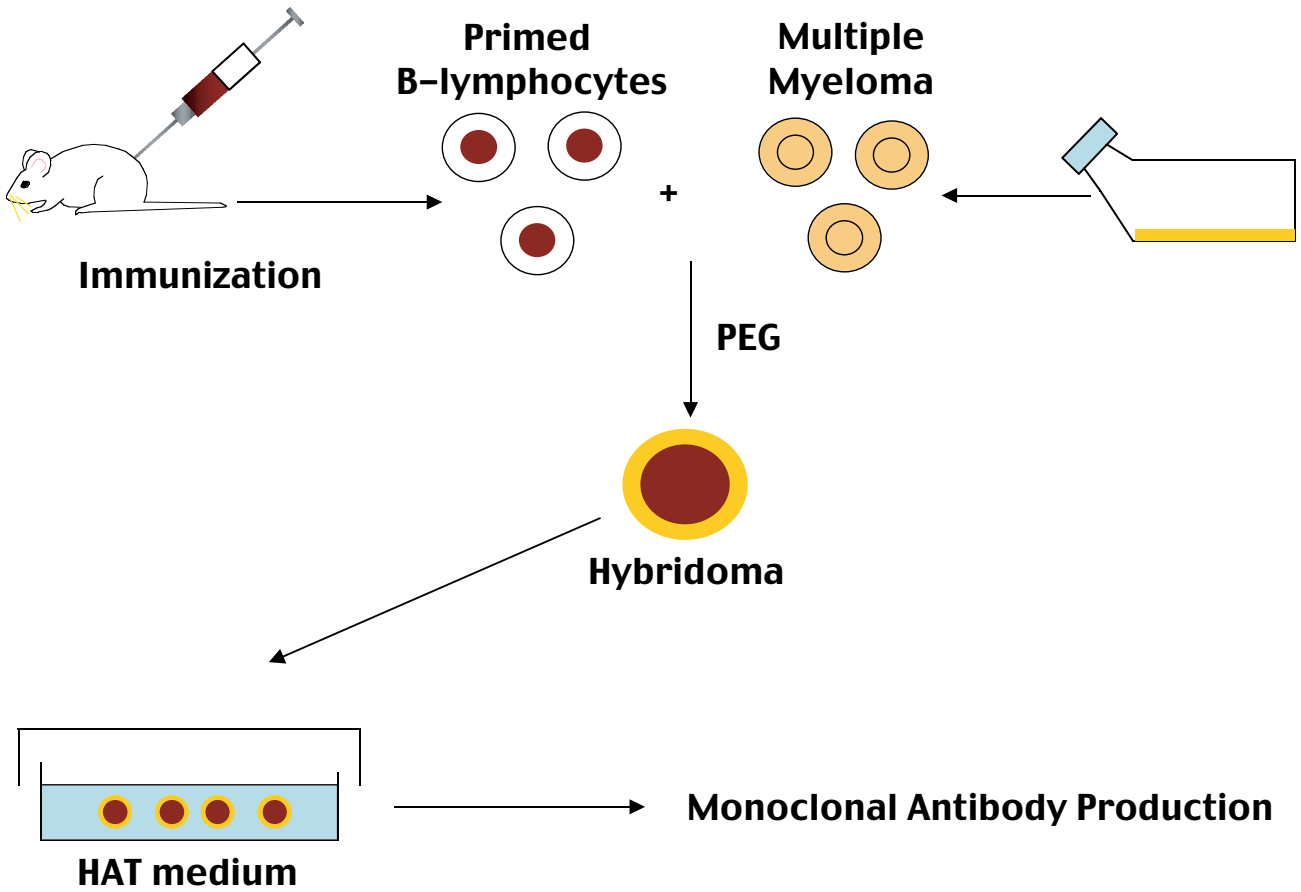
Color Plate 18. Figure 41-32. Example of an isolator used for sterility testing (courtesy, Baxter).



Color Plate 19. Figure 43-1. A cutaway horizontal section of the eyeball illustrating the important anatomic structures and their interrelationships diagrammatically. The different layers of the cornea are illustrated in the magnified view. Relative sizes are suggestive and not proportional. The diameter of a mature eyeball is generally slightly greater than one inch (courtesy, Alcon, Inc., Fort Worth, TX).

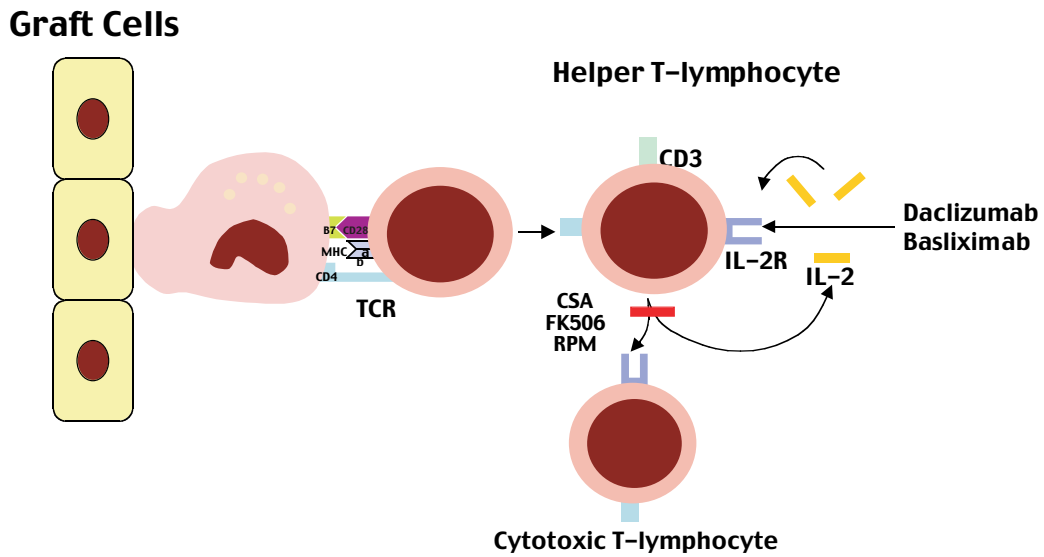


Color Plate 20. Figure 60-1. Immune activation cascade.

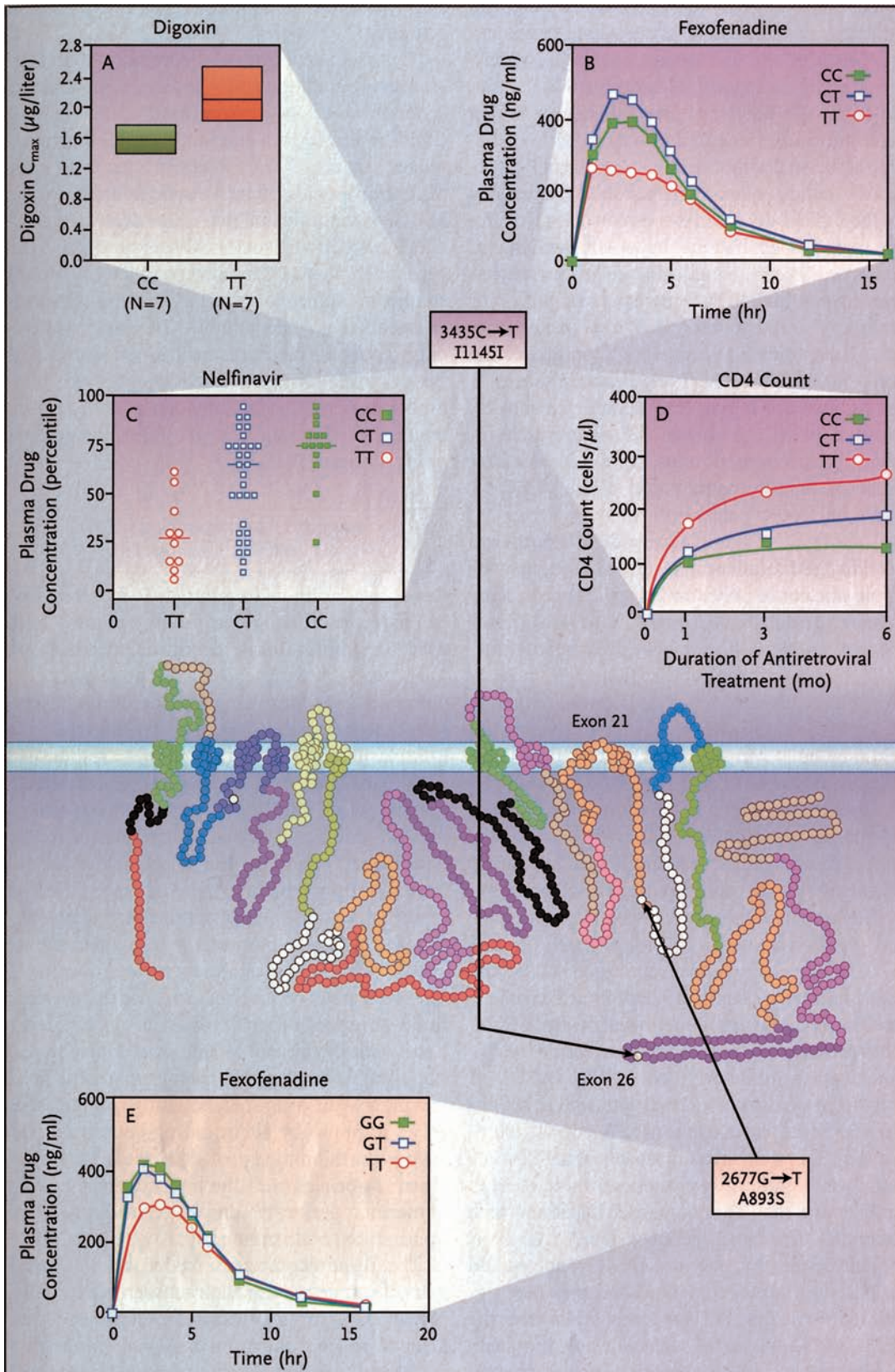


Color Plate 21. Figure 60-2. Production of monoclonal antibodies.

Mechanism of Actions of Immunosuppressive Therapy



Color Plate 22. Figure 60-3. Immunosuppressants' mechanism of actions.



Color Plate 23. Figure 62-3. Functional consequences of genetic polymorphisms in the human p-glycoprotein transporter gene (*MDR1* or *ABCB1*). The schematic of the human P-glycoprotein was adapted from Kim RB, Leake BF, Choo EF, et al. *Clin Pharmacol Ther* 2001; 70:189, with each circle representing an amino acid and each color a different exon encoding the corresponding amino acids. Two SNPs in the human *ABCB1* gene have been associated with altered drug disposition (Panels A,B,C,E) or altered drug effects (Panel D) in humans. The synonymous SNP in exon 26 (nucleotide 3435 C>T SNP), has been associated with higher digoxin oral bioavailability in patients homozygous for the T nucleotide¹⁶⁷ (Panel A), but lower plasma concentrations after oral doses of fexofenadine¹⁷⁰ (Panel B) and nelfinavir¹⁷¹ (Panel C). This SNP has also been linked to better CD4 cell recovery in HIV infected patients treated with nelfinavir and other antiretroviral agents (Panel D).¹⁷¹ The SNP at nucleotide 2766 (G>T) has been associated with lower fexofenadine plasma concentrations in patients homozygous for the T nucleotide at position 2766 (Panel E).¹⁷⁰ Panels A-E have been adapted from the original reports of Kim RB, Leake BF, Choo EF, et al. *Clin Pharmacol Ther* 2001; 70: 189; Hoffmeyer S, Burk O, von Richter O, et al. *Proc Natl Acad Sci U S A* 2000; 97: 3473. and Fellay J, Marzolini C, Meaden ER, et al. *Lancet* 2002; 359: 30. (From Evans WE, McLeod HL. *N Engl J Med* 2003; 348:538.)

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every sale, purchase, and payment must be properly documented to ensure the integrity of the financial statements. This includes keeping receipts, invoices, and bank statements in a secure and organized manner.

The second part of the document provides a detailed overview of the company's revenue streams. It identifies the primary sources of income, such as product sales and service fees, and analyzes their contribution to the overall revenue. This section also includes a breakdown of the revenue by product line and geographic region, allowing for a more granular understanding of the company's performance.

The third part of the document focuses on the company's operating expenses. It details the various costs incurred in the course of business, including salaries, rent, utilities, and marketing. By comparing these expenses to the revenue, the document aims to determine the company's gross and net profit margins, which are key indicators of its financial health.

The fourth part of the document discusses the company's financial position at the end of the reporting period. It provides a summary of the assets, liabilities, and equity, and explains how these components have changed over time. This section also includes a discussion of the company's cash flow, highlighting the sources of funds and the uses of those funds.

Finally, the document concludes with a series of recommendations and future outlook. It offers insights into the company's strengths and weaknesses, and provides suggestions for areas where improvements can be made. The outlook section discusses the company's plans for the coming year, including new product launches and market expansion strategies.