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Leukeran

Leslie R. Hunt

Leslie Hunt
Parkland College
Che 106-001

Leukeran

Generic Name[2]:
Chlorambucil

Trade Name[2]:
Leukeran

Classification[2]:
Antineoplastic, alkylating agent

Uses[2]:
Chlorambucil is used alone or with other antineoplastics to treat chronic lymphocytic leukemia, malignant lymphomas, Hodgkin's disease, giant follicular lymphoma, and cancers of the ovaries, breast, and testes.

Unlabeled Uses[2]:
Unlabeled uses include treatment of nonneoplastic conditions such as vasculitis complicating rheumatoid arthritis, autoimmune hemolytic anemias associated with cold agglutinins, lupus glomerulonephritis, idiopathic nephrotic syndrome, polycythenmia vera, and macroglobulinemia.

Chemical Names[2]:
Chlorambucil. 4-[Bis(2-chloroethyl)amino]benzenebutanoic acid; 4-[p-[bis(2-chloroethyl) amino)]phenyl]-butyric acid; γ-[p-di(2-chloroethyl)aminophenyl]butyric acid; N, N-di-2-chloroethyl-γ-p-aminophenylbutyric acid.

Chemical Formula[2]:
$C_{14}H_{19}Cl_2NO_2$

Available Dosage[2]
2 mg tablets

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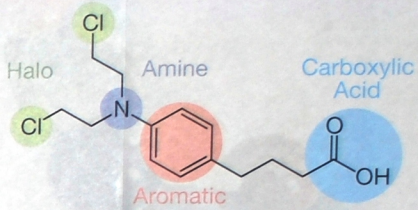

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Group	Hydrophilic or hydrophobic	Acid or base
Halo	hydrophilic	neither
Amine	hydrophilic	base
Aromatic	hydrophobic	neither
Carboxylic Acid	hydrophilic	very, very weak acid

Water Solubility[3]: Chlorambucil is insoluble in water @ 7.73e-02g/l

Dose to Molecules

$$.004\text{ g Leukeran} \times \frac{1\text{ mol Leukeran}}{304.21\text{ g/mol Leukeran}} \times \frac{6.02 \times 10^{23}\text{ molecules of Leukeran}}{1\text{ mol Leukeran}} = 7.92 \times 10^{18}\text{ molecules of Leukeran}$$

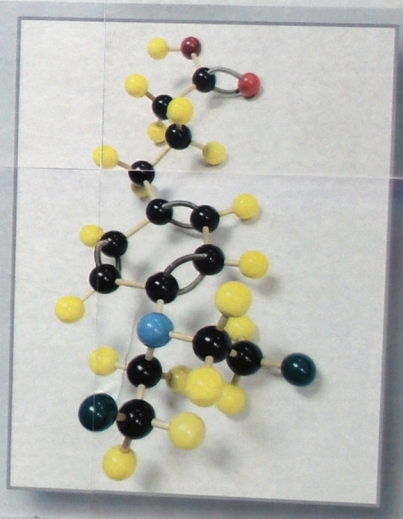
Dose to Tablets

$$\frac{4\text{mg dose}}{1\text{ dose}} \times \frac{1\text{ tablet}}{2\text{ mg}} = 2\text{ tablets}$$

Molar mass of chlorambucil[1]:
14 mol of C × (12.0 g/1mol C) = 168.0 g
19 mol of H × (1.0 g/1 mol H) = 19.0 g
2 mol of Cl × (35.5 g/1mol Cl) = 71.0 g
1 mol of N × (14.0 g/1mol N) = 14.0 g
2 mol of O × (16.0 g/1 mol O) = 32.0 g

168.0 g + 19.0 g +71.0 g + 14.0 g + 32.0 g = 304.0 g

Literature value for molar mass[1]:
304.21 g/mol



The Body's Processing of Chlorambucil[2]:
Chlorambucil is taken orally in pill form. It is taken before or after meals or at bedtime.

Absorption of chlorambucil by the body[2]:
It is quickly absorbed usually within an hour in the upper gastrointestinal tract. Once the medicine is absorbed into the bloodstream, it attacks the cancerous cells and other cells around it and kills them.

Body's breakdown of chlorambucil[2]:
After the body uses the medicine, it travels to the liver where it is broken down and prepared for elimination. More than half of the chlorambucil is eliminated through the urine after it is metabolized in the liver.

References:
1. (2013). Chlorambucil. In O'Neil, M. J., Heckelman, P. E., Dobbelaar, P.H., & Roman, K. J. (Eds.) The Merck Index: An Encyclopedia of Chemicals, Drugs, and Biologicals (p. 367). Cambridge, UK: Royal Society of Chemistry.
2. Wilson, B. A., Shannon, M. T., & Shields, K. M. (2013). Chlorambucil. In Pearson Nurse's Drug Guide 2013 (pp. 295-296). Upper Saddle River, NJ: Pearson Education, Inc.
3. Rai KR, Peterson BL, Appelbaum FR, Kolitz J, Elias L, Shepherd L, Hines J, Threatte GA, Larson RA, Cheson BD, Schiffer CA. Fludarabine compared with chlorambucil as primary therapy for chronic lymphocytic leukemia. N Engl J Med. 2000 Dec 14;343(24): 1750-7. Pubmed. Retrieved from http://www.drugbank.ca
Yang K, Tan J, Wu T. Alkylating agents for Waldenstrom's macroglobulinaemia. Cochrane Database Syst Rev. 2009 Jan 21; (1):CD006719. Pubmed# Foon KA, Hallek MJ. Changing paradigms in the treatment of chronic lymphocytic leukemia. Leukemia. 2010 Mar; 24(3):500-11. Epub 2009 Dec 24. Pubmed. Retrieved from http://www.drugbank.ca
4. [Untitled illustration of Leukeran tablet]. Retrieved 4-19-14 from website http://www.cvs.com/drug/summary/