

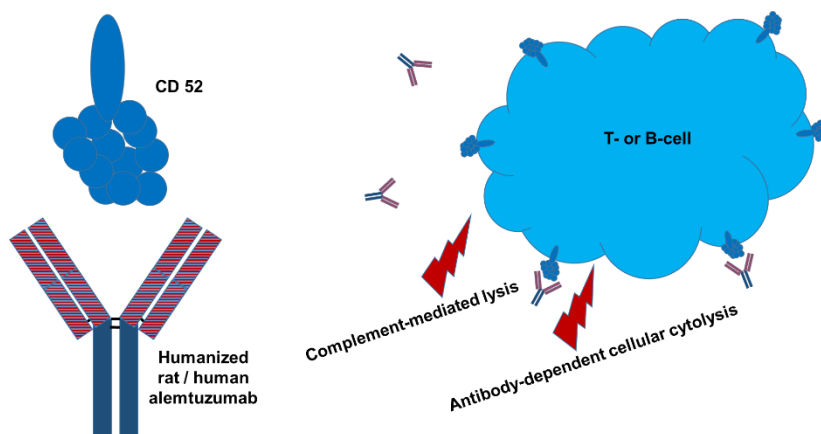
Alemtuzumab – Fact Sheet

Molecule

Alemtuzumab (Lemtrada®) is a humanized monoclonal antibody from the IgG1 kappa type with human variable framework and constant regions, and complementarity-determining regions from a rat monoclonal antibody.

Mode of Action

Alemtuzumab depletes circulating T- and B-cells through antibody-dependent cellular cytotoxicity and complement-mediated lysis. It is directed against the 21–28 kDa cell surface glycoprotein cluster of differentiation (CD)-52 present on the surface of mature lymphocytes, but not on the stem cells from which these lymphocytes are derived. A therapy with alemtuzumab increases the risk for opportunistic infections.



Indication

Alemtuzumab was originally indicated for second-line treatment of chronic lymphocytic leukemia (CLL), cutaneous T-cell lymphoma (CTCL) and normal T-cell lymphoma under trade names Campath®, MabCampath® and Campath-1H®. Currently it is indicated for the treatment

of multiple sclerosis as Lemtrada®. It is also applied for some conditioning regimens for bone marrow transplantation, kidney transplantation, and islet cell transplantation.

Patent Situation

Basic patents for Lemtrada® already expired in 2017. New patents for treatment of multiple sclerosis were not granted.

Market and Competitive Field

Bayer HealthCare, which started the development of alemtuzumab, retains an option to co-promote alemtuzumab in multiple sclerosis. MabCampath® was originally approved for CLL in 2007 by Genzyme / Sanofi. Then it was withdrawn from markets in the US and EU in 2012 to prepare for a higher-priced relaunch of Lemtrada® indicated for multiple sclerosis. In 2018, Genzyme / Sanofi had sales of 402 million € for Lemtrada®, which decreased to 281 in 2019.

		Alemtuzumab
		Lemtrada®
Clone selection/ comparability		
HPLC	Separation based on size (SE-HPLC)	
	Separation based on hydrophobicity (RP-HPLC)	
	Detection of charge variants (CEX-HPLC)	
Binding	Binding to cell surface expressed target (Flow cytometry)	Kit dependent
	Binding to soluble target (ELISA)	Kit dependent
	Binding to specific antibody or antigen (SPR-BIACORE, ELISA)	
	Affinity/ kinetic to recombinant target (SPR-BIACORE)	
Effector function	Binding to C1q, ¹ CDC surrogate (ELISA)	
	Affinity to recombinant Fc-receptors (SPR-BIACORE)	
	Reporter gene assays, ² ADCC surrogate (Luminescence)	
	¹ CDC (Flow cytometry)	
	² ADCC (DELFI, Fluorescence)	n.a.
Gly	Additional bioassays (Luminescence, fluorescence)	
	Glyco-pattern with Lectin Microarray (45 different lectins)	
(Pre)clinical application		
Clinics	Pharmacokinetics – PK (ECL, ELISA)	
	Pharmacodynamics – PD (ECL, ELISA, flow cytometry, bioassay)	
	Immunogenicity - ³ ADAs (ECL, Biacore, ELISA, neutr. assay)	

¹CDC = Complement Dependent Cytotoxicity
²ADCC = Antibody Dependent Cellular Cytotoxicity
³ADA = Anti-Drug Antibody

	VelaLabs portfolio
	VelaLabs planned
	c.l.d. = cell line dependent
	n.a. = not applicable
	In development