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## Design, synthesis, and evaluation of antigenic peptide conjugates containing Toll-like receptor agonists

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# **Design, synthesis, and evaluation of antigenic peptide conjugates containing Toll- like receptor agonists**

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## List of abbreviations

°C	degrees Celsius	DMAP	<i>N,N</i> -dimethylpyridin-4-amine
2-CTC	2-chlorotriyl chloride	DMF	<i>N,N</i> -diethylformamide
Å	Ångstrom	DMPA	dimethylol propionic acid
AA	amino acid	DMSO	dimethyl sulfoxide
Ac	acetyl	DNA	deoxyribonucleic acid
APC	antigen presenting cell	DODT	2,2'-(ethylenedioxy)diethanethiol
Aq.	aqueous	DTT	dithiothreitol
BMDC	bone marrow-derived dendritic cell	EDC·HCl	<i>N</i> -ethyl- <i>N'</i> -(3-dimethylaminopropyl)carbodiimide hydrochloric acid
Boc	<i>tert</i> -butyloxycarbonyl	EDT	ethane-1,2-dithiol
BOP	Benzotriazole-1-yl-oxy-tris-(dimethylamino)-phosphonium hexafluorophosphate	ELISA	enzyme-linked immunosorbent assay
Bz	benzyl	ESI	electrospray ionization
CD	cluster of differentiation	Et	ethyl
CLR	C-type lectin receptor	eq.	equivalent
CMV	cytomegalovirus	FACS	fluorescence-activated cell sorting
conc.	concentrated	FMD	Foot-and-mouth
CTL	cytotoxic T lymphocyte	Fmoc	fluorenylmethyloxycarbonyl
CuAAC	copper-catalyzed azide-alkyne cycloaddition	GalNAc	2-deoxy-2-acetamido-D-galactose
D1-DC	D1 dendritic cells	GM-CSF	granulocyte-macrophage colony-stimulating factor
DAB	diamino butyric acid	h	hour
DAMP	damage associated molecular pattern	HBTU	<i>N,N,N',N'</i> -tetramethyl- <i>O</i> -(1H-benzotriazol-1-yl)uranium hexafluorophosphate
DBU	1,8-diazabicyclo(5.4.0)undec-7-ene	HCTU	<i>N,N,N',N'</i> -tetramethyl- <i>O</i> -(6-chloro-1H-benzotriazol-1-yl)uranium hexafluorophosphate
DC	dendritic cell	HEK293	Human embryonic kidney 293
DCM	dichloromethane	HIV	human immunodeficiency virus
Dde	<i>N</i> -(1-(4,4-dimethyl-2,6-dioxocyclohexylidene)ethyl)		
DIC	<i>N,N</i> -diisopropylcarbodiimide		
DiPEA	<i>N,N</i> -diisopropylethylamine		

HMPB	4-hydroxymethyl-3-methoxyphenoxybutyric acid	MMT	monomethoxytrityl
HOAt	1-hydroxy-7-azabenzotriazole	moDC	monocyte-derived dendritic cell
HOBt	hydroxybenzotriazole	MPLA	mono-phosphoryl lipid A
HPV	Human papillomavirus	MS	mass spectrometry
HRMS	high resolution mass spectrometry	MUC1	mucin 1
h $\nu$	light	MyD88	myeloid differentiation primary response 88
Hz	Hertz	NF- $\kappa$ B	nuclear factor kappa-light-chain-enhancer of B cells
IFN $\gamma$	interferon- $\gamma$	NLR	NOD-like receptor
IgG	immunoglobulin G	NMM	<i>N</i> -methylmorpholine
IgM	immunoglobulin M	NMP	<i>N</i> -methylpyrrolidone
IL	interleukin	NMR	nuclear magnetic resonance
IMDM	Iscove's modified Dulbecco's medium	NO	nitric oxide
IRF	interferon regulatory factor	NOD	nucleotide-binding and oligomerization domain
J8	GAS B cell antigen	OSu	<i>N</i> -hydroxysuccinimide
LC-MS	liquid chromatography-mass spectrometry	OT-1	ovalbumin-specific CD8 <sup>+</sup> T cells
LCP	lipid-core-peptide	PADRE	pan HLA DR-binding epitope
LRR	leucine rich repeats	PAMP	pathogen associated molecular pattern
MALP	macrophage activating lipopeptide	Pbf	2,2,4,6,7-pentamethyldihydrobenzofuran
MAPS	multiple antigen peptide system	PBS	phosphate-buffered saline
MBHA	4-methylbenzhydramine	PHB	4-hydroxybenzylalcohol
MCF	Michigan Cancer Foundation	PRR	pathogen recognition receptor
MCP-1	monocyte chemoattractant protein-1	PyBOP	benzotriazole-1-yl-oxy-tris-pyrrolidino-phosphonium hexafluorophosphate
Me	methyl	RAM	Rink amide
MHC	major-histocompatibility complex	RNA	ribonucleic acid
min	minute	RP-HPLC	reverse-phase high performance liquid chromatography
mini-UPam	(14S,17R) -14-(hydroxymethyl)-13,16,23-trioxo-17-ureido-3,6,9,12,22-pentaoxa-19-thia-15-azaoctatriacontanoic acid	R <sub>t</sub>	retention time

RT	room temperature	THF	tetrahydrofuran
SAR	structure-activity relationship	TIS	triisopropylsilane
sat.	saturated	TIR	toll/IL-1 receptor
SLP	synthetic long peptide	TLC	thin-layer chromatography
SP	synthetic peptide	TLR	toll-like receptor
SPPS	solid-phase peptide synthesis	TLR-L	toll-like receptor ligand
<i>t</i> Bu	<i>tert</i> -butyl	TNF- $\alpha$	tumor necrosis factor alpha
TBTU	2-(1H-benzotriazole-1-yl)-1,1,3,3-tetramethylaminium tetrafluoroborate	TRIF	TIR—domain-containing adaptor-inducing interferon
TC	tissue-culture	Trt	trityl
TCR	T-cell receptor	UPam	1-tetradecyl-urea-Cys((RS)-2,3-di(palmitoyloxy)-propyl)-Ser-Lys-Lys-Lys-Lys
TEA	triethylamine	UPLC	ultra-high performance liquid chromatography
TFA	trifluoroacetic acid		
TFE	tetrafluoroethylene		

## Overview of amino acid nomenclature, standard building blocks and resins





