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Title: Exploitation of host chemokine signalling by pathogenic mycobacteria

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List of abbreviations

AB/TL	AB/Tupfel long fin		activating peptide 78
AC	Adenylyl cyclase	ER	Endoplasmic reticulum
Ackr	Atypical chemokine receptor	ERP	Exported repeated protein
AGM	Aorta, gonads and mesonephros	ESAT-6	Early secretory antigenic target 6 kDa
AJ	Ashkenazi Jewish	ESX-1	ESAT-6 secretion system 1
ASMase	Acid sphingomyelinase	FACS	Fluorescence-activated cell sorting
BALB/c	Bagg Albino/c	Fli1a	Friend leukemia integration 1a
BCA	Bicinchoninic acid	GCP2	Granulocyte chemotactic protein 2
<i>Bcc</i>	<i>Burkholderia cenocepacia</i>	Gcsf	Granulocyte colony stimulating factor
BCG	Bacillus of Calmette–Guérin	GDP, GTP	Guanosine 5'-diphosphate, triphosphate
bHLH	Basic helix-loop-helix	GEF	Guanine nucleotide exchange factor
BLT1	Leukotriene B4 receptor 1	GPCR	G-protein-coupled receptor
bZip	Basic Leucine zipper	GPR35	G-protein-coupled receptor 35
C/ebpβ	CCAAT enhancer-binding protein β	GR	Glucocorticoid receptor
cAMP	Cyclic adenosine monophosphate	Grb2	Growth factor receptor-bound protein 2
Cas9	CRISPR-associated protein 9	GROα, GROβ, GROγ	Growth-regulated protein alpha, beta, gamma
Ccl1	Cys-Cys motif chemokine ligand	HA	Human influenza haemagglutinin
Ccr1	Cys-Cys motif chemokine receptor	HB	Hindbrain
Cdc42	Cell division control protein 42 homologue	HEXA, HEXB	Hexosaminidase A, B
CFU	Colony forming unit	Hif-1α, Hif-2α	Hypoxia-inducible factor 1 alpha, 2 alpha
CHT	Caudal haematopoietic tissue	Hpf	Hours post fertilisation
CLEAR	Coordinated lysosomal expression and regulation	Hpi	Hours post infection/injection
Coro-1a	Coronin 1a	Hpw	Hours post wounding
COX	Cyclooxygenase	HSPC	Haematopoietic stem and progenitor cell
CRISPR	Clustered regularly interspaced short palindromic repeats	I-TAC	Interferon-inducible T-cell alpha chemoattractant
CV	Caudal vein	Ifny	Interferon gamma
Cx3cl	Cys-X3-Cys motif chemokine ligand	Il1β, Il8, Il13	Interleukin 1 beta, 8, 13
Cx3cr	Cys-X3-Cys motif chemokine receptor	iNOS	Inducible nitric oxide synthase
Cxcl	Cys-X-Cys motif chemokine ligand	IP-10	Interferon gamma-inducible protein 10
Cxcr	Cys-X-Cys motif chemokine receptor	IP3	inositol 1,4,5-trisphosphate
Cxl	Cys-X motif chemokine ligand	Irf8	Interferon regulatory factor 8
Cxr	Cys-X motif chemokine receptor	Irg1	Immunoresponsive gene 1
CYPD	Cyclophilin D	JAK	Janus kinase
DAG	Diacylglycerol	kDa	kilo Dalton
DARC	Duffy antigen chemokine receptor	Kdr1	Kinase insert domain receptor-like
DC	Dendritic cell	KO	Knockout
DMSO	Dimethyl sulfoxide	Lamp3	Lysosomal associated membrane protein 3
Dpf	Days post fertilisation	Lc3	Microtubule-associated protein 1A/1B-light chain 3
Dpi	Days post infection/injection	Lck	Lymphocyte cell-specific protein-tyrosine kinase
DRY	Asp-Arg-Tyr	Lp/Lcp1	Leukocyte plastin/ Lymphocyte
dsDNA	Double-stranded DNA		
DUOX	Dual oxidase		
<i>Ec</i>	<i>Escherichia coli</i>		
ECM	Extracellular matrix		
eGFP	Enhanced Green fluorescent protein		
Eif	Eukariotic initiation factor		
ELR	Glu-Leu-Arg		
ENA78	Epithelial-derived neutrophil-		

List of abbreviations

	cytosolic protein 1		
LSD	Lysosomal storage disorder	Ptpn6/Shp1	Protein tyrosine phosphatase, non-receptor type 6/ Src homology region 2 domain-containing phosphatase 1
Lta4h	Leukotriene A4 hydrolase	Ptpre/Cd45	Protein tyrosine phosphatase receptor type C/Cd45
LTB4	Leukotriene B4	PTU	Phenylthiourea
Lyz	Lysozyme	PVP	Polyvinylpyrrolidone
M(Φ)	Monocyte/macrophage	qRT-PCR	Quantitative real time polymerase chain reaction
MAPK	Mitogen-activated protein kinases	Rac1	Ras-related C ₃ botulinum toxin substrate
MIF	Macrophage migration inhibitory factor	RD1	Region of difference 1
MIG	monokine induced by interferon γ	RhoA	Ras homologue gene family member A
miRNA	Micro RNA	RNS	Reactive nitrogen species
Mitf	Microphthalmia-associated transcription factor	ROCK	Rho-associated protein kinase
MLCK	Myosin light-chain kinase	ROS	Reactive oxygen species
<i>Mm</i>	<i>Mycobacterium marinum</i>	shgRNA	Short guide RNA
Mmp 9	Matrix metalloproteinase 9	SNARE	Soluble NSF attachment protein receptor
Mpeg1	Macrophage expressed gene 1	Spi1/Pu.1	Spleen Focus Forming Virus (SFFV) Proviral Integration Oncogene 1/Pu.1
mPTPC	Mitochondrial permeability transition pore complex	Sqstm1/p62	Sequestosome 1/Ubiquitin-binding protein of 62 kDa
Mpx	Myeloperoxidase	ssDNA	Single-stranded DNA
<i>Mtb</i>	<i>Mycobacterium tuberculosis</i>	<i>St</i>	<i>Salmonella enterica</i> Serovar Typhimurium
Myd88	Myeloid differentiation primary response gene 88	STAT	Signal transducer and activator of transcription
M Φ	Macrophage	SV40pA	Simian virus 40 polyadenylation signal
NADPH	Nicotinamide adenine dinucleotide phosphate	T3SS	Type III secretion system
NAI	Nfkb activation inhibitor	T7SS	Type VII secretion system
NAP2	Neutrophil-activating peptide 2	TALEN	Transcription activator-like effector nuclease
Nfkb	Nuclear factor kappa-light-chain-enhancer of activated B cells	TB	Tuberculosis
NK	Natural killer cell	Tfeb, Tfec, Tfe3	Transcription factor E, C, 3
Nlr	Nod-like receptor	Tg	Transgenic
NSAID	Non-steroid antiinflammatory drug	Tiam1	T-lymphoma invasion and metastasis-inducing protein 1
N Φ	Neutrophil	Tlr	Toll-like receptor
P/DAMP	Pathogen and Damage-associated molecular pattern	TM	Transmembrane
PAM	Protospacer adjacent motif	TMT	Trasmembrane transporter
PBS, PBSTx	Phosphate buffer saline, triton x	Tnfa	Tumour necrosis factor alpha
pC3	Previously chromosome 3	Traf6	TNF receptor-associated factor 6
PCR	Polymerase chain reaction	UAS	Upstream activating sequence
PDIM	Phthiocerol dimycocerosate	Vegf	Vascular endothelial growth factor
PGL	Phenolic glycolipid	Vegfr	Vascular endothelial growth factor receptor
PGP	Pro-Gly-Pro	WGD	Whole genome duplication
PH	Plekstrin homology	WHO	World health organisation
PHOX	Phagocytic oxidase	Wt	Wildtype
PI3K	Phosphatidylinositol-4,5-bisphosphate 3-kinase	Xcl	X- Cysteine motif chemokine ligand
PIP2	Phosphatidylinositol 4,5-bisphosphate	Xcr	X- Cysteine motif chemokine receptor
PIP3	Phosphatidylinositol (3,4,5)-trisphosphate	YPD	Yeast extract peptone dextrose
PITPNM3	Phosphatidylinositol transfer protein, membrane-associated 3	ZFN	Zinc finger nuclease
PKC	Protein kinase C		
PLA, PLC	Phospholipase A, C		
Ppiab	Peptidylprolyl isomerase ab		
PRR	Pattern recognition receptor		
PTK	Protein tyrosine kinase		

Nomenclature of zebrafish chemokine ligands

Name in this thesis	Ensembl gene name	zfin gene name	Ensembl gene ID/Alignment position	Ensembl protein ID	Previous /synonymous names and notes
ccl18ab	CR762483.1	-	ENSDARG00000074487	ENSDARP00000101228	-
ccl19aa	ccl19a.1	ccl19a.1	ENSDARG00000058389	ENSDARP00000090385	ccl-c5a, dr-scrNA10579-CCL19-34.3%-DN, si:ch211-8917.4
ccl19ab	ccl19a.2	ccl19a.2	ENSDARG00000035632	ENSDARP00000051667	ccl-c5b, DrUn_WGA13047_1_39000, WGA710_1_710182, zgc:194112, zgc:194121
ccl19b	ccl19b	ccl19b	ENSDARG00000039351	ENSDARP00000114954	ccl19, ccl-c10a, Dr10_WGA780_1_413112, si:dkey-20015.2
ccl20aa	-	-	unmappable	no protein assigned	-
ccl20ab	ENSDARG00000100432	-	ENSDARG00000100432	ENSDARP00000138620	-
ccl20ac	ccl20a.3	ccl20a.3	ENSDARG00000101040	ENSDARP00000138701	chemokine-1, CH73-32017.1, LOC100004509GN, zgc:195209, zgc:195195
ccl20ad	-	-	2:45319950-45317434 (-)	no protein assigned	Incomplete sequence/pseudogene
ccl20b	ccl20b	ccl20b	ENSDARG00000094511	ENSDARP00000122800 ENSDARP00000122912	ccl20, ccl-c24a, Dr24_WGA1806_1_416955, dr-chr24-CCL20-34.6%-DN, si:dkey-150a13.1
ccl25a	CU693369.1	-	ENSDARG00000089534	ENSDARP00000111107	-
ccl25b	ccl25b	ccl25b	ENSDARG00000070873	ENSDARP00000095178	ccl21, ccl-c11a, Dr11_WGA839_1_159228, dr-chr11-CCL21-36.7%-DN
ccl27a	ccl27a	ccl27a	ENSDARG00000058570	ENSDARP00000075898 ENSDARP00000137864	ccl1, Dr8_WGA606_1_66363, wu:fa96a04
ccl27b	ccl27b	ccl27b	ENSDARG00000079713	ENSDARP00000104032	ccl-c10b, Dr9_WGA697_1_854420, dr-chr9-CCL13-28.2%-DN, dr-chr9-CCL17-22.3%-DN
ccl32ab	ccl32a.2	ccl32a.2	ENSDARG00000095049	ENSDARP00000122846 ENSDARP00000141410	ccl-c2c, Dr7_WGA489_1_245599, si:ch211-122124.2
ccl32ac	-	-	2:40365520-40370475 (+)	no protein assigned	-
ccl32ad	-	-	2:40387422-40388412 (+)	no protein assigned	-
ccl32ae	-	-	unmappable	no protein assigned	-
ccl32bc	CT574575.1	-	ENSDARG00000098656	ENSDARP00000137910 ENSDARP00000140796	-
ccl32ca	-	-	KN149905:570-1 (-)	no protein assigned	-
ccl32cb	-	-	KN149905:2766-1821 (-)	no protein assigned	-
ccl32d	-	-	KN150005:21462-23168 (+)	no protein assigned	-
ccl33aa	-	-	25:25106427-25106501 (+)	no protein assigned	Incomplete sequence/pseudogene
ccl33ab	ccl33.2	ccl33.2	ENSDARG00000102519	ENSDARP00000130735 ENSDARP00000138153 ENSDARP00000138433	ccl-c25h, dr-chr25-CCL8-35.6%-EP41974b, si:ch211-149o7.6
ccl33ac	ccl33.3	ccl33.3	ENSDARG00000099401	no protein assigned	ccl-c25a, ccl-c25g, Dr25_WGA1873_1_709505, Dr25_WGA1872_1_17999, dr-chr25-CCL8-30.8-EP41974a, chr25-CCL24-35.6-DN, si:ch211-149o7.4
ccl34aa	-	-	unmappable	no protein assigned	-
ccl34ab	-	-	unmappable	no protein assigned	-
ccl34ac	ccl34a.3	ccl34a.3	ENSDARG00000094983	no protein assigned	ccl-c2e, Dr11_WGA879_1_762108, Dr11_WGA879_1_759152, Dr11_WGA879_1_755946, si:ch211-122124.5
ccl34ad	ccl34a.4	ccl34a.4	ENSDARG00000090873	no protein assigned	ccl-c2d, CC-Chemokine, dr-chr11-CCL19-33.7%-DN, dr-chr11-CCL19-32.7%-DN, si:ch211-122124.4
ccl34ba	ccl34b.1	ccl34b.1	ENSDARG00000093608	ENSDARP00000116086 ENSDARP00000136441	ccl-c24m, Dr22_WGA1631_1_283786, dr-chr22-CCL19-30.3%-DN, si:dkey-25o1.6
ccl34bb	-	-	24:27327959-27327535 (-)	no protein assigned	-
ccl34bb	-	-	unmappable	no protein assigned	-

Nomenclature of zebrafish chemokine ligands

Name in this thesis	Ensembl gene name	zfin gene name	Ensembl gene ID/Alignment position	Ensembl protein ID	Previous /synonymous names and notes
ccl34bc	ccl34b.3	ccl34b.3	ENSDARG00000032993	ENSDDARP00000041769	ccl-c24k, DrUn_WGA7827_1_9830, dr-scNA5340-CCL19-30.5%-DN, si:dkey-25o1.9
ccl34bd	ccl34b.4	ccl34b.4	ENSDARG00000094002	ENSDDARP00000117348 ENSDDARP00000136530	ccl-c24j, DrUn_WGA7827_1_17321, si:dkey-25o1.5
ccl34be	CR383669.1	-	ENSDARG00000099782	ENSDDARP00000137755	-
ccl34bf	CR383669.2	-	ENSDARG00000100520	ENSDDARP00000137901	-
ccl34bg	-	-	KN150005:21462-21536 (+)	no protein assigned	-
ccl34bh	ccl34b.8	ccl34b.8	ENSDARG00000093098	ENSDDARP00000121266	ccl-c24c, si:dkey-25o1.4
ccl34bi	ccl34b.9	ccl34b.9	ENSDARG00000078205	ENSDDARP00000098604	ccl-c24b, si:dkey-25o1.3
ccl34bl	-	-	24:27403153-27402859 (-)	no protein assigned	Incomplete sequence/pseudogene
ccl34bm	-	-	24:27411537-27411245 (-)	no protein assigned	Incomplete sequence/pseudogene
ccl34bn*	si:dkey-25o1.7	si:dkey-25o1.7	ENSDARG00000093570	ENSDDARP00000121438 ENSDDARP00000130107 ENSDDARP00000135013	-
ccl34ea	CABZ01001434.1	-	ENSDARG00000098602	ENSDDARP00000133785 ENSDDARP00000133418	-
ccl34eb	-	-	unmappable	no protein assigned	-
ccl35aa	ccl35.1	ccl35.1	ENSDARG00000103466	ENSDDARP00000132604	ccl-c25y, Dr1_WGA6_1_97332, dr-chr1-CCL26-33.3%-EP26489, zgc:193743, zgc:193706
ccl35ab	ccl35.2	ccl35.2	ENSDARG00000070378	ENSDDARP00000093979	ccl-c25ab, DrUn_WGA2406_1_18581, Dr25_WGA1872_1_197377, zgc:193706
ccl36aa	-	-	7:39442461-39442771 (+)	no protein assigned	Incomplete sequence/pseudogene
ccl36ab	BX908792.2	-	ENSDARG00000105263	ENSDDARP00000138949	-
ccl38aa	ccl38.1	ccl38.1	ENSDARG00000041919	ENSDDARP00000061433 ENSDDARP00000113398 ENSDDARP00000128783	ccl-c20g, Dr20_WGA1544_1_1446828, dr-chr20-CCL7-40.0%-DN, si:dkey-217m5.3
ccl38ac	-	ccl38a.3	unmappable	no protein assigned	ccl-c20e, Dr20_WGA1544_1_375272, Dr20_WGA1544_1_390316, dr-chr20-CCL14-32.9%-DN, si:dkeyp-59a8.5
ccl38ad	ccl38a.4	ccl38a.4	ENSDARG00000041917	ENSDDARP00000061431	ccl-c20d, Dr20_WGA1544_1_386533, zgc:171266, si:dkeyp-59a8.3
ccl2 (ccl38ae)	ccl38a.5	ccl38a.5	ENSDARG00000041835	ENSDDARP00000061310	ccl-c20c, Dr20_WGA1544_1_382837, si:dkeyp-59a8.2
ccl38af	ccl38.6	ccl38.6	ENSDARG00000041923	ENSDDARP00000061436 ENSDDARP00000120680 ENSDDARP00000123921	ccl-c20b, Dr20_WGA1544_1_380308, Dr20_WGA1544_1_390316, dr-chr20-CCL7-35.6%-DN, wu:fj16d01, si:dkeyp-59a8.1
ccl39aa	ccl39.1	ccl39.1	ENSDARG00000101041	ENSDDARP00000130968	ccl-c25q, dr-chr25-CCL13-38.9%-DN, si:dkeyp-55h4.5
ccl39ab	ccl39.2	ccl39.2	ENSDARG00000102945	ENSDDARP00000138051 ENSDDARP00000141835	ccl-c25p, dr-chr25-CCL2-37.5%-DN, si:ch211-149o7.5
ccl39ac	ccl39.3 (ch. 25)	ccl39.3	ENSDARG00000100295	ENSDDARP00000141922 ENSDDARP00000138620	ccl-c25o, dr-chr25-CCL13-35.9%-DN, si:dkeyp-55h4.6
ccl39ad	ccl39.4	ccl39.4	ENSDARG00000104002	ENSDDARP00000130829 ENSDDARP00000138036	ccl-c25n, Dr25_WGA1872_1_141073, dr-chr25-CCL11-31.2%-DN, si:dkeyp-55h4.7
ccl39ae	ccl39.5	ccl39.5	ENSDARG00000098460	ENSDDARP00000141305	ccl-c25m, dr-chr25-CCL2-35.0%-DN, dr-chr25-CCL2-36.4%-DN, si:dkeyp-55h4.8
ccl39af	ccl39.6	ccl39.6	ENSDARG00000105089	ENSDDARP00000132580	ccl-c25l, si:dkeyp-55h4.9
ccl39ag	ccl39.7	ccl39.7	ENSDARG00000099982	ENSDDARP00000133318 ENSDDARP00000138980	ccl-c25k, Dr25_WGA1873_1_857912, si:dkeyp-55h4.10
ccl39ah	CR450808.1	-	ENSDARG00000100484	ENSDDARP00000135517	-
ccl39ai	-	-	25:12816818-12816285 (-)	no protein assigned	Incomplete sequence/pseudogene
ccl39aj*	ccl39a.10	ccl39a.10	ENSDARG00000096060	ENSDDARP00000125562	ccl-c25z, si:ch211-202c4.2
ccl39ba*	ccl39.3 (ch. 6)	-	ENSDARG00000101499	ENSDDARP00000130440	Incomplete sequence/pseudogene
ccl44	ccl44	ccl44	ENSDARG00000074772	ENSDDARP00000101027	ccl-c11b, Dr11_WGA839_1_233313
cxcl8a	CT826376.2	cxcl8a	ENSDARG00000104795	ENSDDARP00000137520	cxcl8, il8, cxcl-c1a, CXCL8_L1_chrl1, dr-chr1-CXCL8, si:dkey-151b16.2
cxcl8ba	-	-	7:7671156-7665921 (-)	no protein assigned	-

Name in this thesis	Ensembl gene name	zfin gene name	Ensembl gene ID/Alignment position	Ensembl protein ID	Previous /synonymous names and notes
excel8bb	excel8b.1	excel8b.1	ENSDARG00000102299	ENSDARP00000131403 ENSDARP00000136965	ii812, excel8_l2_chr17
excel8bc	excel8b.3	excel8b.3	ENSDARG00000099169	ENSDARP00000136707	excel-c13d, CXCL8_l2_chr7, dr-scNA16716-CXCL8
excel11aa	CXCL11 (1 of many)	excel11.1	ENSDARG00000100662	ENSDARP00000135444	excel11i, excel-c5d, dr-chr5-CXCL11, vig7, SCYB9B, b-R1, IP-9, H174, SCYB11, I-TAC
excel11ab	-	excel11.2	5:42290344-42290046 (-)	no protein assigned	dr-chr5-CXCL11-27.4-DN Incomplete sequence/pseudogene
excel11ac	ENSDARG00000102514	excel11.3	ENSDARG00000102514	ENSDARP00000136965	cxc-66, cxcl-c5e, dr-chr5-CXCL11-37.2-EK12810
excel11ad	CXCL11 (1 of many)	excel11.4	ENSDARG00000101138	ENSDARP00000133434	excel11i2, cxc-56, cxcl-c5f, dr-chr5-CXCL9-35.1-EK43819, SCYB9B, b-R1, IP-9, H174, SCYB11, I-TAC
excel11ae	excel11.5	excel11.5	ENSDARG00000092423	ENSDARP00000115162 ENSDARP00000136838	cxcl-c5g, dr-chr1-CXCL11-37.1-DN, si:ch211-202a12.7
excel11af	excel11.6	excel11.6	ENSDARG00000094706	ENSDARP00000112794	cxcl-c5h, si:ch211-202a12.8
excel11ag	excel11.7	excel11.7	ENSDARG00000093779	ENSDARP00000116772	cxcl-c5i, dr-chr1-CXCL9-37.2-EK42273, si:ch211-202a12.9
excel11ah	excel11.8	excel11.8	ENSDARG00000095747	ENSDARP00000123477	cxc-64, cxcl-c5b, dr-chr5-CXCL11-25.2-EP22087, si:dkey-58f10.5
excel12a	excel12a	excel12a	ENSDARG00000037116	ENSDARP00000053945	excel12, sdf1, sdf1a, umm t30516, umm t30516, wu:fa55e10, wu:fc16h12, wu:fb84c02
excel12b	excel12b	excel12b	ENSDARG00000055100	ENSDARP00000071878	sdf1b, zgc:136720
excel13	si:dkey-58f10.3	-	ENSDARG00000095112	no protein assigned	-
excel14	excel14	excel14	ENSDARG00000056627	ENSDARP00000109550	scyba, fb67g04, wu:fb67g04
excel18aa	-	-	13:30566063-30568522 (+)	no protein assigned	Incomplete sequence/pseudogene
excel18b	excel18b	excel18b	ENSDARG00000075045	ENSDARP00000102296	cxcl-c1c, dr-chr25-CXCL11-28.0-EP27297, si:ch73-6k14.1GN
excel19	excel19	excel19	ENSDARG00000102776	ENSDARP00000135787	cxcl-c13d, dr-scNA11550-CXCL2-36.0%-DN
excel20b	excel20	excel20	ENSDARG00000075163	ENSDARP00000102486	cxcl-c5c, dareCXc, dr-chr5-CXCL10-28.6%-DN
excel32ba	excel32b.1	excel32b.1	ENSDARG00000071499	ENSDARP00000096549	cxcl-c24e, si:ch211-260d11.1, scNA16670-CCL8-33.3-DN
excel32bb	CT574575.2	-	ENSDARG00000099822	ENSDARP00000131333	-
exl34bj	-	-	24:27385246-27384292 (-)	no protein assigned	-
exl34bk	cxl34b.11	cxl34b.11	ENSDARG00000092283	ENSDARP00000115786	cxl-c24a, xcl1, si:dkey-25o1.2
cxl34c	cxl34c	cxl34c	ENSDARG00000096664	ENSDARP00000126667	cxl-c12a, wu:fb09d09, si:ch211-125g7.3
cxl34d	-	-	7:57100469-57102607 (+)	no protein assigned	-
xcl32aa	xcl32a.1	xcl32a.1	ENSDARG00000093906	ENSDARP00000118951	cxl-c2a, si:ch211-122i24.3

Notes: Comparison of the nomenclature applied in this work (column 1) with the nomenclature used in Ensembl and zfin databases or elsewhere in literature (columns 2-6). The nomenclature adopted here essentially reflects the systematic classification suggested by Nomiyama *et al.*, *Genes Cells*. 2013. Exceptions are made for genes where other names are largely in use (for these cases the name according to Nomiyama *et al.*, 2013 is reported in brackets in column 1). Names followed by asterisks (*) indicate sequences which were not annotated in Nomiyama *et al.*, 2013. Rows highlighted in grey represent either incomplete sequences or previously reported genes that cannot be mapped on the current version of the zebrafish genome (Ensembl, GRCz10, September 2016).

Nomenclature of zebrafish chemokine receptors

Name in this thesis	Ensembl gene name	zfin gene name	Ensembl gene ID/Alignment position	Ensembl protein ID	Previous /synonymous names and notes
ackr2/d6*	CU633991.1	-	ENSDARG000000086314	ENSDARP000000108059	-
ackr3a/cxcr7a	ackr3 (1 of many)	ackr3a	ENSDARG000000062478	ENSDARP000000084847	drRDC1a, si:dkey-191g15.12, si:dkeyp-74a11.11
ackr3b/cxcr7b	ackr3b	ackr3b	ENSDARG000000058179	ENSDARP000000063664	drRDC1b, sb:cb900, si:dkey-96h14.2
ackr4a/cerl1a	ackr4a	ackr4a	ENSDARG000000078729	ENSDARP000000116973	zfCCRL1-1
ackr4b/cerl1b	ackr4b	ackr4b	ENSDARG000000040133	ENSDARP000000058702	drCCRL1b, zfCCRL1-2, sb:eu250
ackr6/pitpnm3*	pitpnm3	pitpnm3	ENSDARG000000055255	ENSDARP000000072049	wu:fk08b02, fk08b02
cer4laa	cer8.1	cer8.1	ENSDARG000000095789	ENSDARP000000125541	cer41, dr-chr16-CCR4-43.1-EK47490, zfCCR8-1
cer4lab	CABZ01093075.1	CABZ01093075.1	ENSDARG000000086616	ENSDARP000000105159	zfCCR8-2
cer4lac	cer8	si:cabz01093077.1	ENSDARG000000105467	ENSDARP000000142256	GPR-CY6, CMKBRR, TER1, CY6, CKR-L1, CDw198, CMKBRL2
cer6a	cer6a	cer6a	ENSDARG000000087474	ENSDARP000000106824	zfCCR6-2, si:bx813304.1, zgc:86782, si:dkey-47g2.1
cer6b	cer6b	cer6b	ENSDARG000000038968	ENSDARP000000128924 ENSDARP000000056883	zfCCR6-1, wu:fk31f08
cer7	cer7	cer7	ENSDARG000000044561	ENSDARP000000118528	zfCCR7, zgc:165629
cer9a	cer9a	cer9a	ENSDARG000000055186	ENSDARP000000071978	cer9, zfCCR9-1, dr-chr2-CCR9-44.2-EK8447, sb:eu630
cer9b	cer9b	cer9b	ENSDARG000000099738	ENSDARP000000134711 ENSDARP000000137365	cer9l, dr-chr9-CCR9-39.2-EK48843, zfCCR9-2, LOC100006078
cer10	cer10	cer10	ENSDARG000000040643	ENSDARP000000099267	zgc:91924
cer11aa	cerl1.1	cerl1.1	ENSDARG000000070755	ENSDARP000000094951 ENSDARP000000142387	cx3er1l, zfCCR2-1, dr-chr21-CX3CR1-40.7%-EK41814,
cer2 (cer11ab)	si:ch211-207g17.2	si:ch211-207g17.2	ENSDARG000000079829	ENSDARP000000142081 ENSDARP000000094958	-
cer11ac	si:ch211-207g17.3	si:ch211-207g17.3	ENSDARG000000105363	ENSDARP000000142057	-
cer12a	cerl2a	cerl2a	ENSDARG000000038541	ENSDARP000000122747	cer12.3, zfCCR3-3, si:ch211-106n13.2
cer12ba	cerl2b.1	cerl2b.1	ENSDARG000000059410	ENSDARP000000126464	cer12.1, zfCCR3-1, si:dkey-225n22.5
cer12bb	cerl2b.2	cerl2b.2	ENSDARG000000026417	ENSDARP000000066871	cer5.2, cerl2.2, CCR12bb, CCR5-35.0%-EK36093, zfCCR3-2
cxcr1 (cxcr1ba)	si:ch73-54b5.2	si:ch73-54b5.2	ENSDARG000000052088	ENSDARP000000068360	zmp:0000001086
cxcr2 (cxcr1bb)	cxcr2	cxcr2	ENSDARG000000054975	ENSDARP000000071727	si:ch73-54b5.1
cxcr3.1 (cxcr3ab)	cxcr3.1	cxcr3.1	ENSDARG000000007358	ENSDARP000000137552	dr-chr16-CXCR3-41.8-EK27498, sb:eu378
cxcr3.2 (cxcr3l)	cxcr3.2	cxcr3.2	ENSDARG000000041041	ENSDARP000000122984	dr-chr16-CXCR3-37.5-EK27053, zgc:92301
cxcr3.3 (cxcr3aa)	cxcr3.3	cxcr3.3	ENSDARG000000070669	ENSDARP000000119122	si:dkey-269d20.3
cxcr4a	cxcr4a	cxcr4a	ENSDARG000000057633	ENSDARP000000074800 ENSDARP000000123851	cb824
cxcr4b	cxcr4b	cxcr4b	ENSDARG000000041959	ENSDARP000000061498	cxcr4, odysseus, ody, cb403, drCXCR4b1, zgc:109863
cxcr5	cxcr5	cxcr5	ENSDARG000000010514	ENSDARP000000010091	MDR15, BLR1, CD185
cxcr8a/gpr35a*	ENSDARG000000075877	-	ENSDARG000000075877	ENSDARP000000103013	-
cxcr8ba/gpr35ba*	gpr35.1	gpr35.1	ENSDARG000000074633	ENSDARP000000133176 ENSDARP000000103106	zgc:171586
cxcr8bb/gpr35bb*	ENSDARG000000086776	gpr35.2	ENSDARG000000086776	ENSDARP00000011768	zmp:0000001226
xcr1aa	xcr1a.1	xcr1a.1	ENSDARG000000054847	ENSDARP000000071590 ENSDARP000000103498	xcr1, xcr1a
xcr1ab	si:ch73-217b7.4	xcr1a.2	ENSDARG000000054846	no protein assigned	Incomplete sequence/pseudogene

Name in this thesis	Ensembl gene name	zfin gene name	Ensembl gene ID/Alignment position	Ensembl protein ID	Previous /synonymous names and notes
xcr1ac	si:ch73-217b7.3	xcr1a.3	ENSDARG00000087978	no protein assigned	Incomplete sequence/pseudogene
xcr1ba	CABZ01053221.1	xcr1b.2	ENSDARG00000058774	ENSDARP00000076150	drXCR1b
xcr1bc	XCR1 (1 of many)	xcr1b.1	ENSDARG00000052988	ENSDARP00000069429	xcr1b, GPR5, CCXCR1, zmp:0000001090
xcr1bd	CABZ01053219.1	xcr1b.3	ENSDARG00000089840	ENSDARP00000110709	ccr8.3, zfCCR8-3

Notes: Comparison of the nomenclature applied in this work (column 1) with the nomenclature used in Ensembl and zfin databases or elsewhere in literature (columns 2-6). The nomenclature adopted here essentially reflects the systematic classification suggested by Nomiyama *et al.*, *Genes Cells*. 2013. Exceptions are made for genes where other names are largely in use (for these cases the name according to Nomiyama *et al.*, 2013 is reported in brackets in column 1). Names followed by asterisks (*) indicate sequences which were not annotated in Nomiyama *et al.*, 2013. Rows highlighted in grey represent either incomplete sequences or previously reported genes that cannot be mapped on the current version of the zebrafish genome (Ensembl, GRCz10, September 2016).

Curriculum vitae

Vincenzo Torraca was born on September 6th, 1987 in Salerno, Italy. He obtained his high school diploma and professional certificate in Industrial and Food Chemistry in 2006, at the Technical and Industrial Institute B. Focaccia, in Salerno. At Salerno University, he obtained his bachelor degree in 2009 (*summa cum laude*) in computational and molecular biology, after completing an internship on the molecular characterisation of different natural and commercial accessions of *Origanum vulgare* (CRA-ORT, research centre for the horticulture, Battipaglia, Italy, under supervision of dr. F. Campanile and dr. M. Zaccardelli) and on the catalytic activity of genomic DNA for the Michael reaction (Salerno University, under supervision of dr. M. De Rosa and prof. dr. A. Soriente). In 2010, he was selected for the European Erasmus summer school “multidisciplinary approaches to microarray data analysis”, Ascea Italy. In 2011, he obtained his master degree (*summa cum laude*) in Biology by Salerno University, after having carried a research internship at Leiden University (the Netherlands), through the European LLP-Erasmus exchange program. Under the supervision of dr. A. Chatzopoulou, dr. M.J. Schaaf (Leiden University) and prof. dr. E.A. Illingworth (Salerno University), he investigated the function of an alternative splicing isoform of the glucocorticoid receptor, using the zebrafish (*Danio rerio*) model. In 2011, he obtained the national qualification as professional senior biologist, by the University of Sannio (Benevento, Italy). In 2012, he joined the group of prof. dr. A.H. Meijer (Institute of Biology, Leiden University) as a PhD candidate, funded by the Marie Skłodowska-Curie Initial Training Network FishForPharma. During his PhD he obtained extensive training on the zebrafish *in vivo* model for infectious diseases and specifically analysed in-depth the function of host chemokine signalling during infection with *Mycobacterium marinum*. In 2016, he was awarded with an individual Marie Skłodowska-Curie postdoctoral fellowship to join the group of dr. S. Mostowy (Imperial College London, UK), where he will continue his research on the zebrafish-*M. marinum* host-pathogen model and study the function of cytoskeleton dynamics during mycobacterial infections.

List of publications

Torraca V, in't Veld E, Meijer AH. Disruption of chemotactic signaling primes the lysosomal function of macrophages to counteract mycobacterial parasitism. *Manuscript in preparation.*

Tulotta C, Stefanescu C, **Torraca V**, Meijer AH, Snaar-Jagalska BE. **CXCR4 signaling in the tumor microenvironment orchestrates experimental metastasis formation by controlling myeloid cell motility and response to malignant cells.** *Manuscript in preparation.*

Torraca V, Otto NA, Tavakoli-Tameh A, Meijer AH. **The inflammatory chemokine Cxcl18b exerts neutrophil-specific chemotaxis via the promiscuous chemokine receptor Cxcr2 in zebrafish.** *Submitted manuscript.*

Torraca V, Tulotta C, Snaar-Jagalska BE, Meijer AH. **The chemokine receptor CXCR4 promotes granuloma formation by sustaining a mycobacteria-induced angiogenesis program.** *Submitted manuscript.*

Torraca V and Mostowy S. **Septins and Bacterial Infection.** *Front Cell Dev Biol. In press.*

Masud S, **Torraca V**, Meijer AH. **Modeling infectious diseases in the context of a developing immune system.** *Curr Top Dev Biol. In press.*

Torraca V, Cui C, Boland R, Bebelman JP, van der Sar AM, Smit MJ, Siderius M, Spaink HP, Meijer AH. **The CXCR3/CXCL11 signaling axis mediates macrophage recruitment and dissemination of mycobacterial infection.** *Dis Model Mech.* 2015, 8:253-69.

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Zhou X, Laroche F, Lamers GEM, **Torraca V**, Voskamp P, Lu T, Chu F, Spaink HP, Abrahams JP, Liu Z. **Ultra-small graphene oxide functionalized with polyethylenimine (PEI) for very efficient gene delivery in cell and zebrafish embryos.** *Nano Res.* 2012, 5:703-709.