**Supplementary table 1: Overview of articles about CD8+ T cells in GCA**

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|  | **Disease, n** | **Disease duration and treatment** | **Age, years****sex, male/ female (M/F)** | **Methods\*** | **Results** |
| **Circulation/ *in vitro*** | **Tissue** |
| Benlahrache (67) | PMR, 28GCA, 7HCs, 35 | Mean 2 yearsGlucocorticoids n=24 | PMR/GCA: Mean 72.6, 7M 28FHCs: mean 77.2, 7M 28F | Indirect IF offrozen mononuclear cells. | Lower percentages of T cells and CD8+ T cells in patients than in HCs. | n.a.\*\* |
| Banks (69) | Circulation:GCA/PMR, 6Tissue:GCA/PMR, 14 | Mean, 6 monthsCirculation: Before treatmentTissue:Glucocorticoids n=6 | GCA: mean 73, 2M 12F | Frozen TABsFlow cytometry on heparin WB and PBMCs. . | Circulating CD8+ T cells within normal range. | In two tissues, 25-50 % of tissue infiltrates were CD8+ T cells and in 12 tissues, 0-25% were CD8+ T cells. |
| Andersson (68) | PMR, 4GCA, 6HCs, 108 | Before treatment | PMR/GCA: mean 68, 4M 6FHCs: 20-60 , 108M | Flow cytometry on heparin WB. | No differences in relative percentages of CD8+ T cells in patients compared to normal reference values. | n.a. |
| Dasgupta (65) | PMR/GCA, 33HCs, 20 | Before treatment |  | Cell counts of WB.Flow cytometry on fresh PBMCs. | Decrease in absolute and relative numbers/ percentages of CD8+ T cells which normalized after 24 months | n.a. |
| Macchioni (66) | PMR/GCA,22HCs, 61 | Mean, 7 weeksBefore treatment | PMR/GCA: mean 70.2, 6M 16F | Flow cytometry on EDTA WB. | Decrease in absolute and relative numbers/ percentages of CD8+ T cells. | n.a. |
| Pountain (71) | GCA/PMR, 36HCs andOsteoarthritis, 36 | Before treatment | GCA/PMR: Median 70 | Cell counts and flow cytometry on WB.  | No differences in absolute and relative numbers/percentages of CD8+ T cells in patients and controls.Patients with most severe disease had reduced CD8+ T cell numbers. | n.a. |
| Udhammar (70) | PMR, 23Positive TAB, 1HCs, 14 | Mean, 24 monthsBefore treatment | PMR: mean 70.7, 7M 16FHCs: mean 73.5, 6M 8F | Cell counts and flow cytometry on EDTA WB. | No differences in absolute and relative numbers/percentages of CD8+ T cells in patients and controls. | n.a. |
| Martinez-Taboada (74) | PMR, 12GCA, 6HCs, 9 | Before treatment | PMR: mean 72.9, 2M 10FGCA: mean 73.8, 2M 4FHCs: mean 69, 4M 5F | CD8+ T cells isolated by magnetic beads of andflow cytometry and Vβ specific PCR, spectratyping on fresh PBMCs. | PMR/GCA patients had clonally expanded CD8 populations.Frequency of clonal expansion was not different from HCs. | n.a. |
| Martinez-Taboada (72) | PMR, 28GCA, 6Disease controls, 18 | Before treatment | GCA/ PMR: mean 69.9, 10M 24FDisease controls: mean 59, 3M 14F | Flow cytometry on EDTA WB. | No differences in absolute and relative numbers and percentages of CD8+ T cells in patients and controls |  |
| Lopez-Hoyos (73) | PMR, 18GCA, 5HCs, 23 | Before treatment | GCA/PMR: mean 73.2, 12M 11FHCs: mean 73, 9M 14F | HLA typing on PBMCs. Flow cytometry on WB | Percentages and absolute numbers of CD8+ T cells were comparable in patients and controls. No differences in percentages and absolute numbers of CD8+CD28+, CD8+CD57+, CD8+CD45RA+, CD8+CD45RO+ andCD8+CD25+ subsets. Clonal expansions were detected in CD8+ T cells of HCs and patients. | n.a. |
| Schaufelberger (75) | Circulation:GCA, 7Tissue:GCA, 5 | Mean 9 weeks1 day glucocorticoids n=2 | GCA: median 67, 1M 6F | IHC on TABs.Flow cytometry on WB. | No expanded T-cell populations. | Six out of seven patients had expanded T-cell populations in TABs.Between 12% and 46% of T cells were CD8+ in TABs. |
| Dejaco (78) | GCA, 16PMR, 78HCs, 64 | \*\*\*GCA: mean 24 monthsBefore treatment n=2PMR: mean 6 monthsBefore treatmentn=15  | \*\*\*GCA: mean 74.5, 3M 11FPMR: mean 70.1, 10M 57F | IF for NKG2D/CD3 double staining in three TABs. IF and IHC for NKG2D ligand expression. mRNA levels ligands by RT-PCR.Cell proliferation experiments, intracellular IFN-γ and TNF-α staining by Flow cytometry in CD4+ and CD8+ T cells isolated by magnetic beads. | NKG2D was expressed by CD4+CD28- and CD8+CD28- and CD8+CD28+ cells in patients.CD3+CD8+CD28- cells were increased in patients.NKG2D relative expression by CD8+CD28+ cells was higher in patients.Patients on high-dose corticosteroids had higher relative NKG2D expression by CD8+CD28+ cells. | CD3+NKG2D+ cells were found around the vaso vasorum in the adventitia.More MICA was found in positive TABs than in negative TABs. |
| Samson (25) | GCA, 34For spectratyping, 9HCs, 26For spectratyping, 7 | Before treatmentSpectratyping: 3 untreated, 6 treated | GCA: mean 75.3, 13M 21FHCs: mean 73.1, 10M 16F | Flow cytometry on fresh PBMCs.Luminex for serum markers. IHC on TABs.RT-PCR, TCR Vβ spectratyping on CD8+ T cells isolated by magnetic beads. | No differences in numbers of CD8+ T cells.Higher perturbation index in GCA patients compared to HCs illustrates presence of clonal CD8+ T cell expansion.Increased frequency of cytotoxic CD8+ T cells. | CXCL9, -10 and -11 seems to be involved in CXCR3+CD8+ T cell migration to arterial wall.More CD8+ T cell infiltration in TABs correlates with more severe disease. |
| Wen (80) | GCA, 13HCs, 64 | Untreated: n=7Glucocorticoids : n=6 | GCA: mean 72.3HCs: range 20-84 | *In vitro* experiments performed on isolated subsets of CD4+ and CD8+ T cells from fresh PBMCs. | Deficiency of NADPH oxidase 2 accounts for CD8+ Treg failure in older donors and GCA patients. |  |
| De Smit (82) | GCA, 16HCs, 16 | Acute phase and follow up.Analysis took into account untreated n=6 and treated at first timepoint | GCA: mean 78.2, 2M 14FHCs: mean 76.6, 2M 14F | CD4+ and CD8+ T cells isolated by magnet beads.RNA isolated for RNA sequencing. | *SGTB* and *FCGR3A* remained differently expressed after 12 months. *IL32­* correlated with symptoms such as blindness. | n.a. |
| Jin (81) | GCA, 102. Numbers vary per experiment. | Untreated: n=37 | GCA: mean 73.4, 74F | Sorted CD8+CD39+CD26- Tregs or *ex vivo* induced CD8+ Tregs from GCA patients and HCs for assessment of functionalities of CD8+ Tregs.CD8+ Treg function was determined in NSG mice in which vasculitis was induced in engrafted human arteries.  | n.a. | Functional failure of anti-inflammatory CD8+ Treg cells was a consequence of aberrant signaling through the NOTCH4 receptor.  |

\* TAB: temporal artery biopsy. WB: whole blood. PBMCS: peripheral blood mononuclear cells. IHC: immune histochemistry. IF: immunofluorescence. NSG: NOD scid gamma mouse

\*\* n.a. : not applicable

\*\*\*Clinical data available of 11 GCA and 67 PMR patients

**Supplementary table 2: Overview of articles about CD8+ T cells in GPA**

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|  | **Disease, n** | **Disease duration, disease state and treatment** | **Age, years****sex, male/ female (M/F)****CMV** | **Methods\*** | **Results** |
| **Circulation/ *in vitro*** | **Tissue/ Animal model** |
| Moosig (98) | GPA, 24HCs, 17 | Mean 5.1 yrsActive n=9Inactive n=15glucocorticoids n=22cyclophosphamide n=10methotrexate =8 | GPA: mean 56, range 36-75, 17M 7FHCs: mean 57, range 34-75, 12M 5F | Flow cytometry on WB.*in vitro* PBMCs stimulated with PHA and PMA.APCs depleted with T cells incubated with IFN-γ. | Frequencies of CD4+CD28+ and CD8+CD28+ lower in GPA than HCs, after *in vitro* stimulation.Percentages of CD28+ cells correlated negatively with disease activity. | n.a. \*\* |
| Lamprecht (99) | Circulation: GPA, 10HCs, 15Tissue:GPA, 10Disease controls, 6  | Mean 3.5 yrsBefore treatment n=1Relapse n=7Partial remission n=2 | GPA: mean 63Controls: mean 44Statistically significant difference | Flow cytometry on WB and BAL fluid.IF for T cell and CD28 double staining on biopsies. | More CD28- cells in CD8+ T cells in BAL than in blood of patients but not in controls. Total numbers of CD4+CD28- but not of CD8+CD28- was higher in BAL than blood in patients.Total numbers of CD8+CD28- higher in patients than in HCs. | Higher fraction of CD28- T cells in CD8+ T cells in BAL of patients.CD28- T cells found in granulomatous lesions. |
| Coulomb-L’Hermine (24) | GPA, 6Disease controls, 6 | Untreated | GPA: range 40-73, 1M 5F | IHC on lung tissues.In situ hybridization and PCR for cytokine expression. | n.a. | Lymphocytes in lung lesions of GPA patients are mostly memory CD4+CD45RO+ and CD8+CD45RO+. |
| Aasarød (88) | GPA, 61 | Treated: n=18 | GPA: mean 57, range 15-80 | IHC on renal biopsies. | n.a. | Intraglomerular leucocytes consisted of macrophages and T cells and no B cells. More than 2 thirds were CD8+ T cells. CD8 T cells were mainly adjacent to Bowman’s capsule |
| Ohta (92) | GPA, 7HCs, 10 | Median 42 m.Glucocorticoids: n=7Cyclophosphamide: n=5 | GPA: median 49.5, range 24-68, 3M 4F | Flow cytometry on and PMA stimulation of PBMCs. | Population of Tc-1 cells in GPA was increased. | n.a. |
| Vogt (96) | GPA, 55Disease controls, 8HCs, 35For telomere lengths:GPA, 22Disease controls, 8HCs, 10 | None active diseaseGPA > 5 yrs, n=31GPA > 5 yrs, 1 active episode, n=13GPA ≤5 yrs, n=11 | GPA: range 24-77 | Telomere length by southern blotting.CD28 by cytofluorometry. | GPA > 5 yrs: short telomeres in addition to normal telomeres, indicating replicative senescence of T cell clones.CD8+CD28+ expression lower in patients especially in GPA >5 yrs and short telomeres (n=7)2 older donors had short telomeres | n.a. |
| Lamprecht (106) | GPA, 6Controls, 6 | Active: n=4Remission: n=2All were treated | All patients and controls were CMV positive | PBMCs were incubated with HLA-restricted CMV pp65 peptide-MHC class I tetramer complexes. | HCs had lower CD28 expression on CMV-specific CD8+tet+ T-cells compared to the CD8+tet− [T-cell](https://www-sciencedirect-com.proxy-ub.rug.nl/topics/biochemistry-genetics-and-molecular-biology/t-cell)s.CD28 was lower or absent on CMV-specific CD8+tet+ in GPA than HCs.CD28 was lower and CD27 higher on CMV-specific CD8+tet+ T-cells and CD8+tet− T-cells in patients. | n.a. |
| Lamprecht (94) | GPA, 21HCs, 13 | Localized: n=5.All remissionGeneralized: n=16Active: n=9Remission: n=7 |  | Flow cytometry on PBMCs. | Fractions of CCR5+ and CCR3+ cells within the CD4+CD45RO+ and CD8+CD45RO+ memory T cell populations were significantly expanded in localized and generalized GPA. | n.a. |
| Abdulahad (91) | GPA, 57HCs, 21 | Active: n=17, treated n=3, mean duration 0 mRemission: n=40, treated n=11Mean duration 78 m | Active: median 55, range 19-85, 10M 7FRemission: median 57, range 17-87, 24M 16FHCs: mean 51, range 20-83, 9M 12F | Flow cytometry on fresh PBMCs. | The distribution of naive and memory CD8+T cells did not differ between patients and HCs. | n.a. |
| Holmén (100) | GPA, 6 | Active: n=6Without current treatment | GPA: range 36-80, 4M 3F | Kidney sections stained with anti-MICA, anti-CD8 and anti-NKG2D. | n.a. | MICA is expressed around glomerular vessels and epithelial cells. NKG2D and CD8 T cells located around tubular and glomerular capillaries. |
| Iking-Konert (93) | AAV, 90 | Active: n=10, relapse n=1, untreated GPA n=4, untreated MPA n=5Remission: n=80GPA n=47MPA n=33 |  | Flow cytometry on WB.Co-cultivation experiments with CD8+ T cells isolated by magnetic beadsand PMN | Active disease: CD8+CD28+CD11b+ cells produce IFN-γ. In HCs and patients in remission or on immunosuppressive therapy CD11b was associated with CD8+CD28- cells.CD11b is upregulated when T cells are activated. CD11b expression persists and CD28 is lost. IFN-γ-producing T cells activate PMN to express MHC class II. | n.a. |
| Iking-Konert (101) | Exact numbers unclearGPA, 52MPA, 33HCs, 34 | Active: n=5Remission: n=80Before treatment n=4 | Presumably:GPA: median 36, n=9. Median 68, n=46HCs: median 36, n=10. Median 68, n=27 | Flow cytometry on WB. | CD8+CD57+ increased with age.In younger patients CD8+CD57+ was increased compared to HCs.CD8+CD57+ correlated with disease severity | n.a. |
| Blaschke (95) | Circulation:GPA, 16HCs, 16Tissue:GPA, 5Disease controls, 4 | Mean 5.6 yrsActive: n=6Remission: n=10 | Circulation:12M 4FTissue:GPA: range 29-54 yrs. | Flow cytometry on PBMCs.PBMCs stimulated with PMA to detect XCL1 expression.ELISA for XCL1 levels in serum.IHC double labelling XCL1 and CD4, CD8 and CD68.PMN stimulated with recombinant XCL1. | XCL1 expression was higher in patients in CD4+ and CD8+ T cells.Mainly CD8+CD28- T cells expressed XCL1.Active patients had more XCL1+ CD4+ and CD8+.PMNs produced IL-8 upon XCL1 stimulation.No differences in serum XCL1 levels between all groups. | XCL1 was expressed in interstitium of renal biopsies in CD4+ and CD8+ T cells. |
| McKinney (109) | AAV, 59SLE, 25 | Active: n=34N=27 as validation.Group 1: before treatmentGroup 2: n=24 before treatment | Group 1: mean 57.5, 9M 10F4 MPO, 15 PR3Group 2: mean 62, 15M 25F16 MPO, 22 PR3 | Transcriptional profiling of purified CD8+ T cells. | Poor prognosis is associated with IL7R pathway, TCR signaling and memory T cell transcripts, and an expanded CD8+ memory population. | n.a. |
| Eriksson (102) | GPA, 24MPA, 10HCs, 20 | Active: n=12 GPA, n=6 MPARemission: n=12 GPA, n=4 MPA | Remission: median 75, 7M 9FActive: median 67, 12M 2FHCs: median 70, 12F 8F | Flow cytometry on WB. | Active patients: total numbers and proportions of lymphocytes decreased. Total numbers of CD8+CD28- and CD8+CD57+ were decreased.CMV was associated with expanded proportions of CD28- and CD57+ cells in CD4+ and CD8+ compartments. | n.a. |
| McKinney (110) | AAV, 59 |   | Group 1: mean 57.5, 9M 10F4 MPO, 15 PR3Group 2: mean 62, 15M 25F16 MPO, 22 PR3 | Microarray gene expression profiling of RNA of PBMCs, CD4+ and CD8+ T cells | Transcriptome profile of CD8+ T cells resembling an exhausted signature is correlated with good outcome in autoimmunity such as in AAV. | n.a. |
| O’Sullivan (89) | MPO-AAV, 47 | Before treatment | MPO-AAV: mean 67, 32M 15F |  | n.a. | Tubulointerstitial macrophages, CD4+ and CD8+ T cells, and neutrophils correlated with low presenting eGFR. |
| Kerstein (97) | GPA, 20HCs, 20 | Mean 35 mActive: n=4Remission: n=16 | GPA: mean 64, range 44-74) 16M 4F | Flow cytometry on WB.RNA from isolated CD4+ and CD8+ T cells fortranscriptome analysis, GPA n=3, HCs n=3.PBMCs stimulated with viral peptide, percentage of dextramer positive cells determined.Proliferation by CFSE dilution. | Increased percentages of CD4+CD28-, CD8+CD28- and CD4+CD8+ cells in GPA.Transcriptome analyses reveal antigen and cytokine impact on T cells in GPA.CMV and EBV associated with CD28- T cells in GPA. | n.a. |
| Chang (112) | Mouse model |  |  | Anti-MPO glomerulonephritis mouse model | n.a. | CD8+ T cell depletion led to less injury. Pathogenic MPO-specific CD8+ T cells in a mouse model mediated by MPO-specific CD4+ T cells led to more severe disease.Transfer without CD4+ T cells mediated injury when MPO was transferred in glomeruli. |
| Kidder (90) | AAV, 38 | Before treatmentMPA: n=24GPA: n=14 | AAV: median 66, range 25-76. | IHC on renal biopsies ofmacrophages and T cells  | n.a. | Interstitial macrophages and CD8+ T cells were correlated (weakly) with low renal function. |
| Chen (113) | Mouse model |  |  |  | n.a. | CD8+ T cells infiltrated glomeruli and were in direct contact with EGFP+ podocytes when there was disruption of Bowman’s Capsule. |

\* WB: whole blood. APCs: antigen presenting cells. PBMCS: peripheral blood mononuclear cells. IF: immunofluorescence. IHC: immune histochemistry. PCR: polymerase chain reaction. PMN: polymorphonuclear neutrophils

\*\*n.a. : not applicable