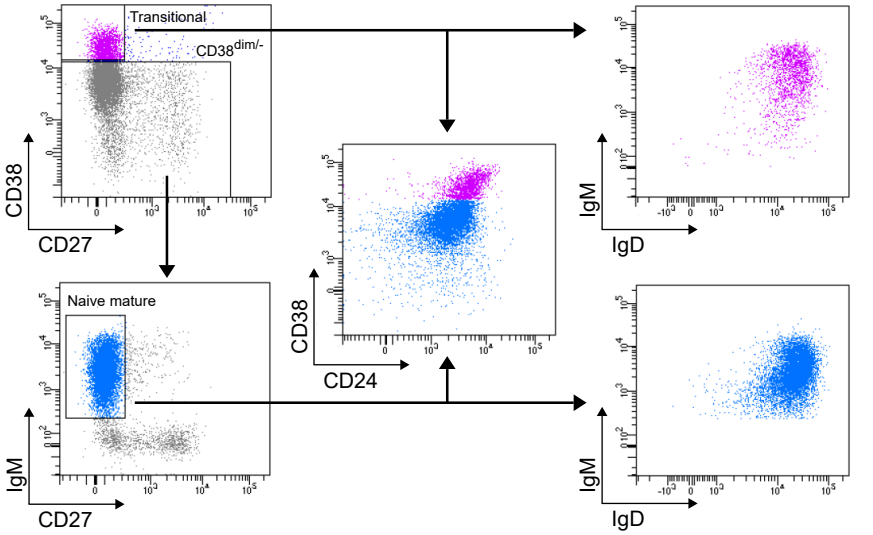
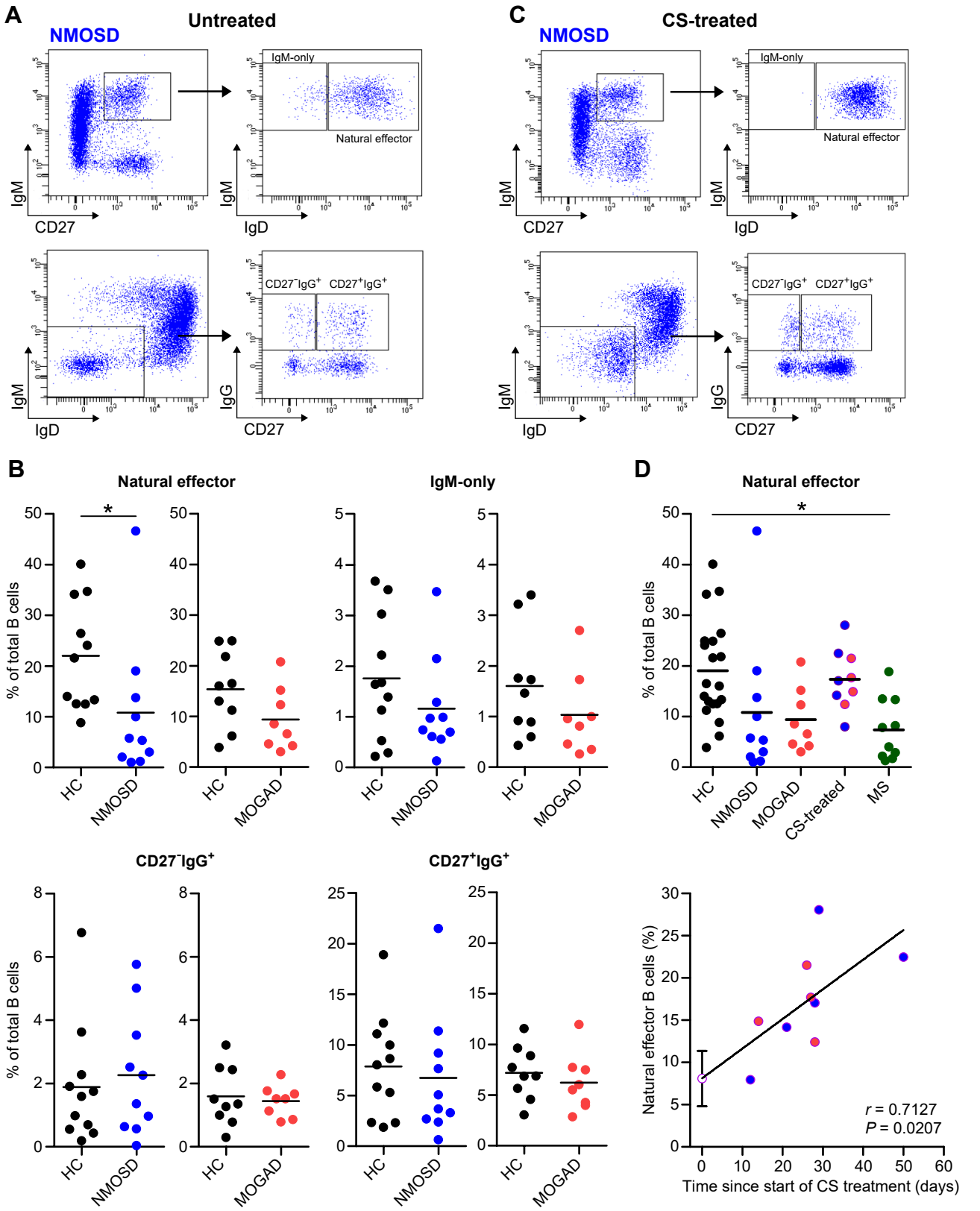
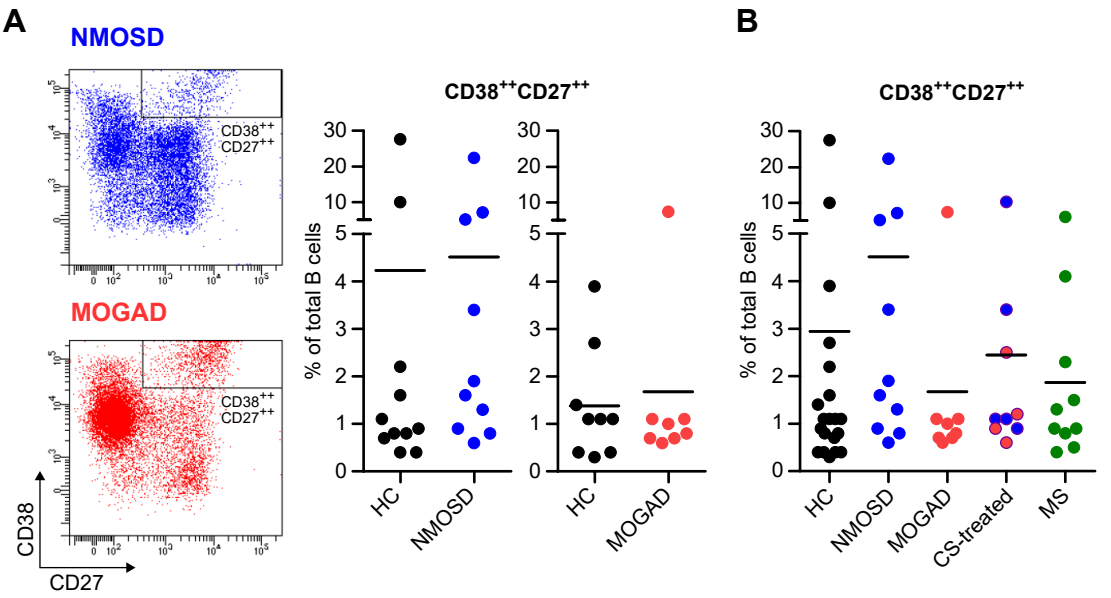


Supplementary Figure 1. Expression of CD24, IgD and IgM on transitional and naive mature B cells in NMOSD blood.



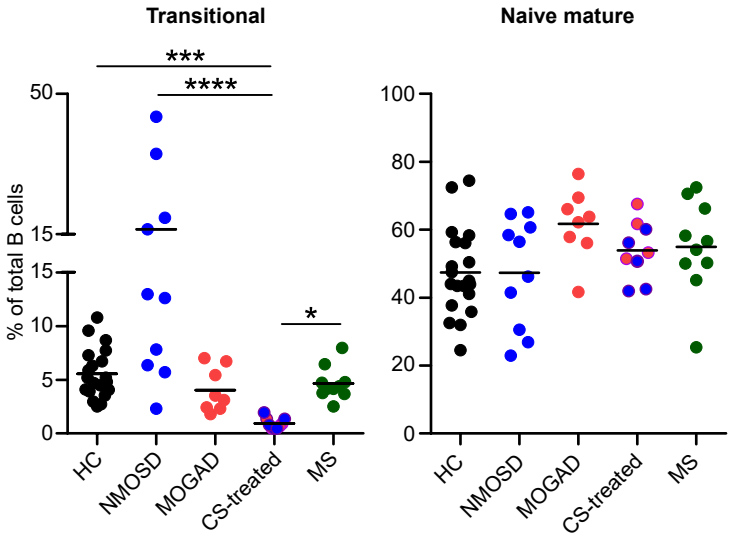
Supplementary Figure 2. Presence of *ex vivo* memory B-cell subsets in the blood of untreated and CS-treated NMOSD, MOGAD, MS and HC subgroups.

Gating strategy for the identification of IgM-only ($CD27^+IgM^+IgD^-$), natural effector ($CD27^+IgM^+IgD^+$) and IgG^+ (both $CD27^-$ and $CD27^+$) memory B cells from the blood of a treatment-naive (**A**) and a corticosteroid (CS)-treated (**C**) AQP4-IgG positive NMOSD patient. Fractions were compared between NMOSD (n = 10) and MOGAD (n = 8) and age- and gender-matched healthy controls (HC) for each group (for NMOSD, n = 11; for MOGAD n = 9; **B**). (**D**) Fractions of natural effector memory B cells in CS-naive NMOSD, MOGAD, MS and HC, as well as CS-treated NMOSD and MOGAD groups and their correlation to time since start of CS treatment.



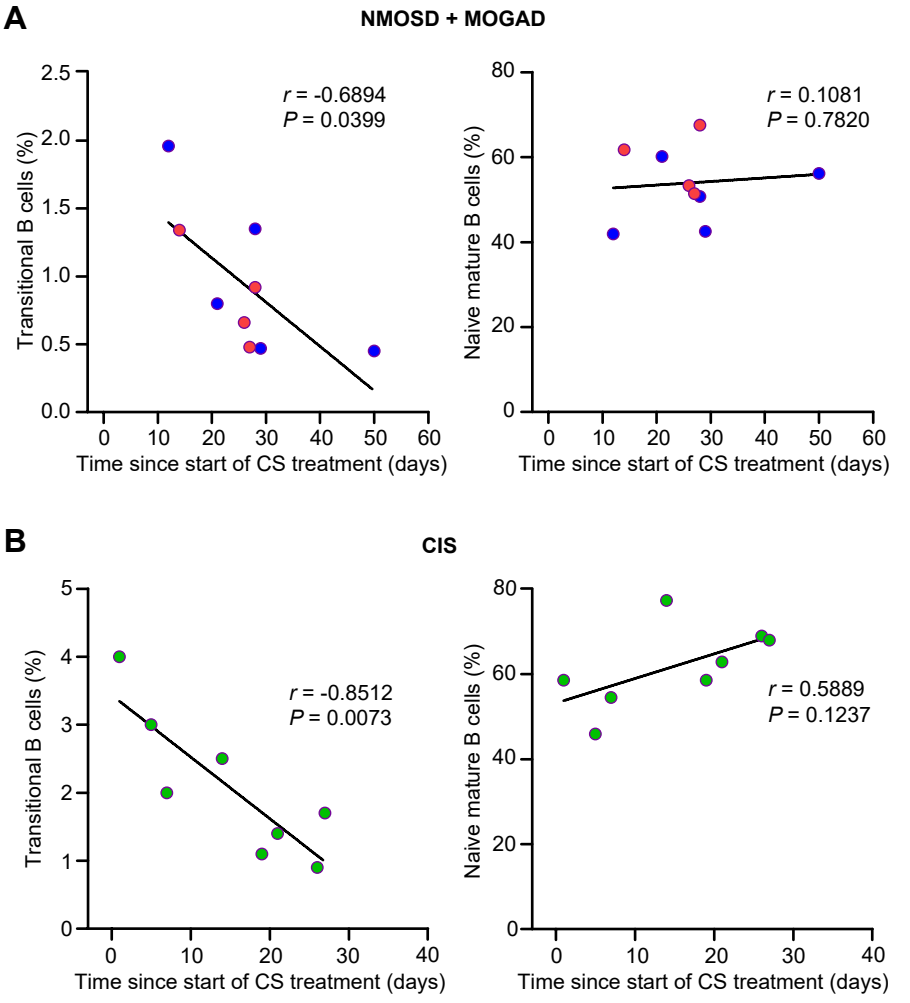
Supplementary Figure 3. Frequencies of *ex vivo* plasmablasts in the blood of untreated and CS-treated NMOSD, MOGAD, MS and HC subgroups.

Representative gating and frequencies of circulating plasmablasts ($CD38^{++}CD27^{++}$) in treatment-naive (**A**) and corticosteroid (CS)-treated (**B**) NMOSD and MOGAD patients. Fractions of *ex vivo* plasmablasts within the total $CD19^{+}$ pool were compared between CS-naive NMOSD (n = 10), CS-naive MOGAD (n = 8), CS-treated NMOSD or MOGAD (n = 9), MS (n = 10) as well as age- and gender-matched HC (for NMOSD, n = 11; for MOGAD, n = 9) groups.



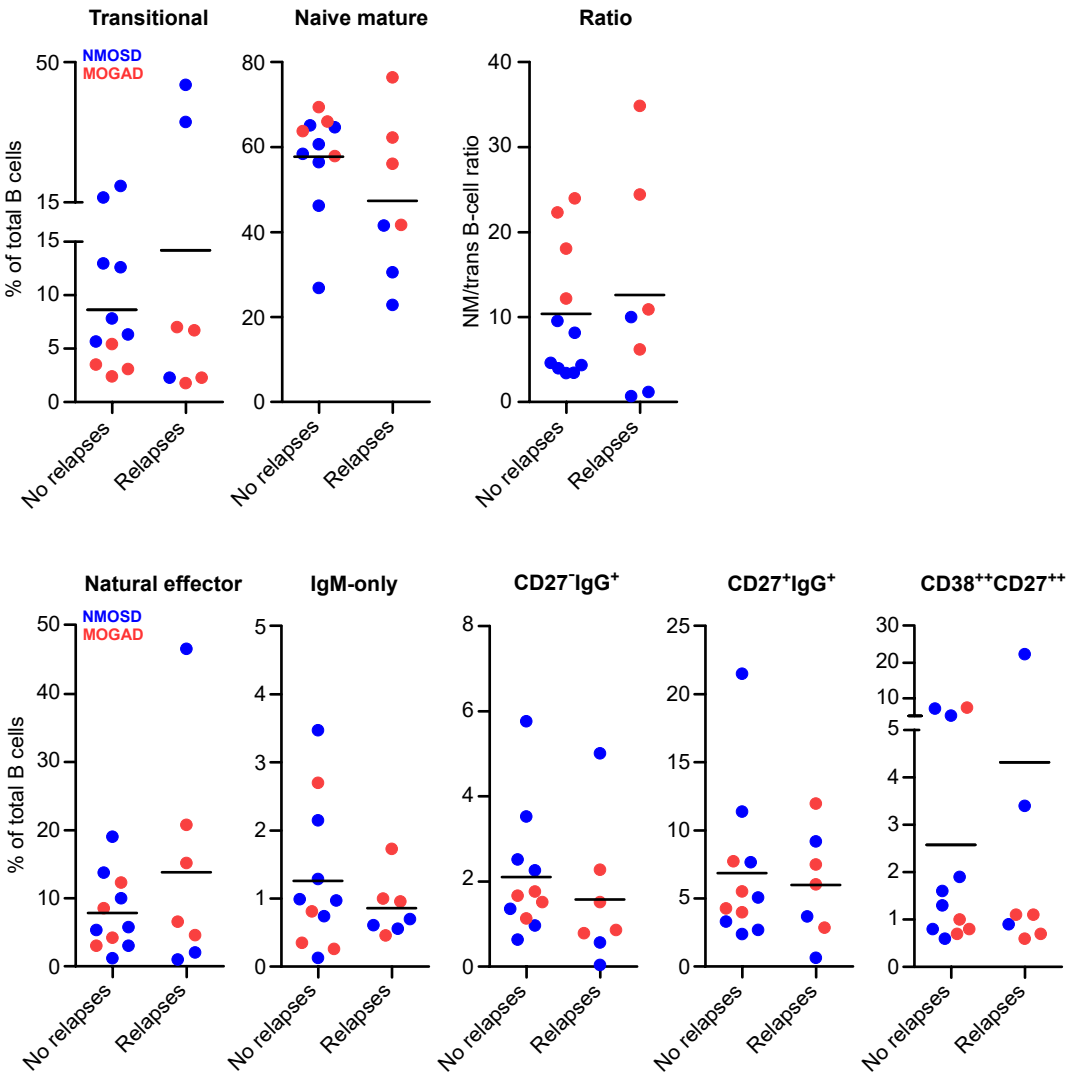
Supplementary Figure 4. Composition of the naive B-cell pool in the blood of untreated and CS-treated NMOSD, MOGAD, MS and HC subgroups.

Proportions of circulating transitional and naive mature B cells within the total $CD19^+$ pool were assessed in CS-naive NMOSD ($n = 10$), CS-naive MOGAD ($n = 8$), CS-treated NMOSD or MOGAD ($n = 9$), MS ($n = 10$) and HC ($n = 20$) groups.



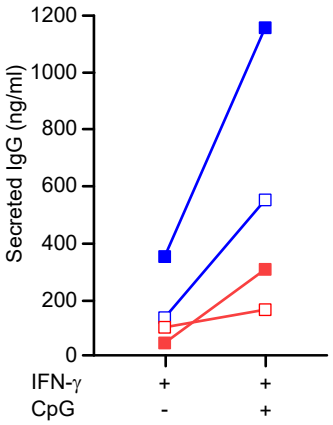
Supplementary Figure 5. The impact of CS treatment on the presence of transitional and naive mature B cells in the blood.

Proportions of circulating transitional and naive mature B cells were correlated to time since start of CS treatment in NMOSD or MOGAD (n = 9; **A**) and clinically isolated syndrome (CIS, n = 8; **B**) groups.



Supplementary Figure 6. Presence of *ex vivo* B-cell subsets in relapsing and non-relapsing NMOSD and MOGAD subgroups.

Proportions of naive and memory B-cell subsets as well as plasmablasts ($CD38^{++}CD27^{++}$) were analyzed in the blood using FACS and compared between CS-naive NMOSD (blue) and MOGAD (red) patients with and without relapses.



Supplementary Figure 7. Validation of the differences in IgG secretion by *in vitro*-generated plasmablasts between NMOSD and MOGAD subgroups.
Plasmablasts were generated from naive mature B cells of a relapsing (solid box) and non-relapsing (open box) NMOSD and MOGAD patient under IFN-γ and/or CpG-ODN-inducing germinal-center like conditions. IgG secretion was compared after 11 days.