**Supplementary Table 1** Histological subtypes
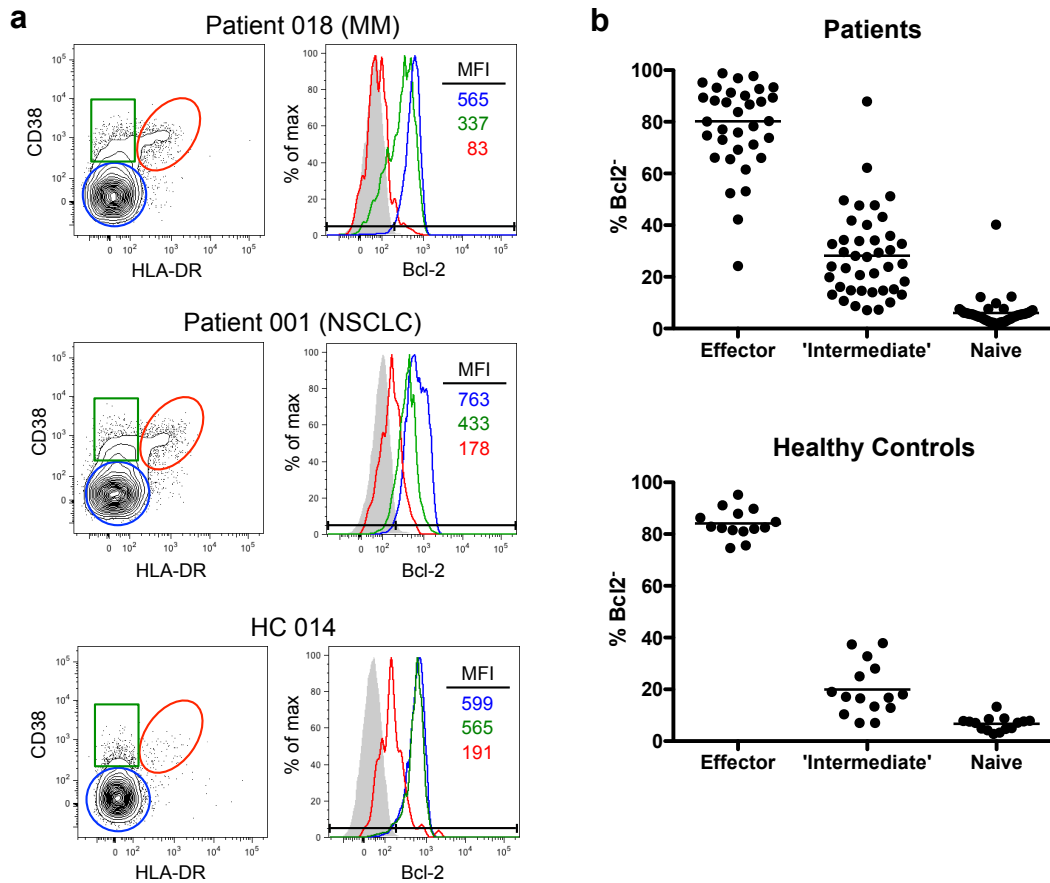
|  | n (%) |
|---|---|
| MM (n = 27) | |
|     Epithelial | 9 (33) |
|     Biphasic | 4 (15) |
|     Sarcomatoid | 5 (19) |
|     Other | 2 (7) |
|     Unknown | 7 (26) |
| NSCLC (n = 16) | |
|     Squamous cell | 5 (31) |
|     Adenocarcinoma | 9 (56) |
|     Other | 1 (6) |
|     Unknown | 1 (6) |

Other histologies included histiocytoid MM, peritoneal MM and bronchoalveolar NSCLC
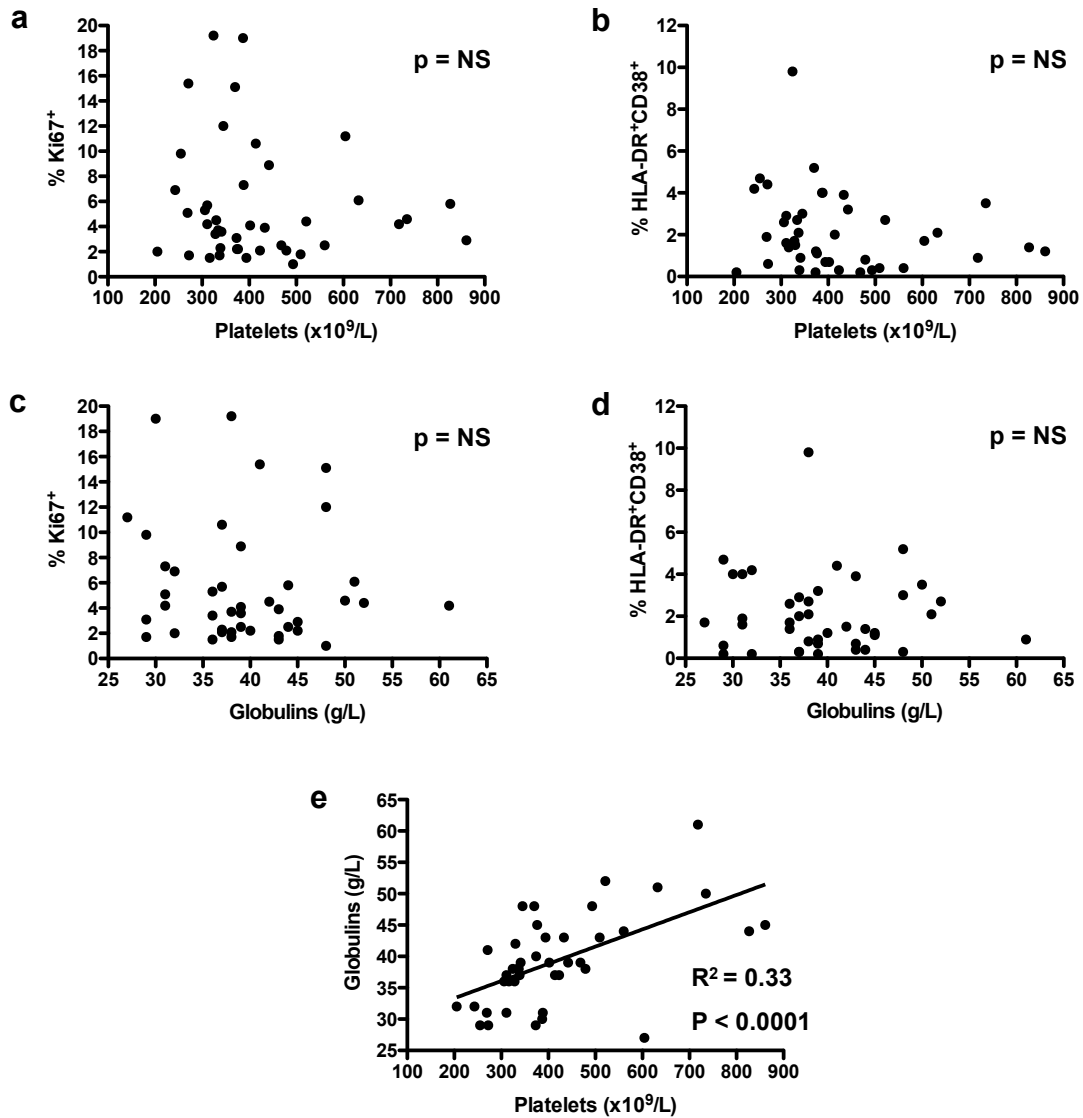
**Supplementary Table 2** Cox proportional hazards regression using continuous variables

|  | univariate | | | multivariate | | |
|---|---|---|---|---|---|---|
|  | **HR** | **95% CI** | **P** | **HR** | **95% CI** | **P** |
| Proliferating CD8$^+$ T cells (%) | **1.10** | **1.02 – 1.18** | **0.015** | **1.10** | **1.01 – 1.21** | **0.034** |
| Treg (%) | **1.22** | **1.06 – 1.41** | **0.005** | 1.12 | 0.96 – 1.31 | 0.165 |
| Gender, male / female | 0.48 | 0.91 – 1.01 | 0.132 | 0.42 | 0.13 – 1.37 | 0.150 |
| Age (years) | 1.01 | 0.97 – 1.04 | 0.159 | 1.01 | 0.97 – 1.06 | 0.552 |
| ECOG status (0, 1 or 2-3) | **2.24** | **1.14 – 4.43** | **0.020** | 1.78 | 0.82 – 3.85 | 0.145 |
| WBC (x10$^9$/L) | 1.13 | 0.96 – 1.34 | 0.147 | 0.92 | 0.73 – 1.15 | 0.445 |
| Haemoglobin (g/L) | 1.00 | 0.99 – 1.01 | 0.139 | 1.01 | 1.00 – 1.01 | 0.256 |
| Platelets (x10$^9$/L) | 1.00 | 1.00 – 1.00 | 0.150 | 1.00 | 1.00 – 1.01 | 0.101 |
| Diagnosis, MM / NSCLC | 0.85 | 0.41 – 1.78 | 0.673 | 1.04 | 0.46 – 2.32 | 0.928 |

CI, confidence interval; ECOG, Eastern Cooperative Oncology Group; HR, hazard ratio; WBC, white blood cell count

**Supplementary Fig. 1** Bcl-2 down-regulation in HLA-DR$^+$CD38$^+$ effector CD8$^+$ T cells. **a** Representative plots from two patients and a healthy control showing Bcl-2 expression in effector (HLA-DR$^+$CD38$^+$; red gate and line) versus naïve (HLA-DR$^-$CD38$^-$; blue gate and line) cells. HLA-DR$^-$CD38$^+$ cells with intermediate Bcl-2 expression (green gate and line) in the patient samples may represent effector cells in the early stages of activation, cells differentiating into memory cells or cells responding to less immunogenic stimuli / without appropriate costimulation. Plots are gated on CD8$^+$ T cells. Shaded area corresponds to the isotype control. MFI, mean fluorescence intensity. **b** Proportion of Bcl-2$^-$ cells within effector, 'intermediate' and naïve CD8$^+$ T cell populations in all patient and control samples. Dots represent individual patients / controls; line at mean

**Supplementary Fig. 2** Levels of proliferating and effector CD8$^+$ T cells do not correlate with markers of non-specific systemic inflammation. **a-d** Linear regression analyses of proliferating (Ki67$^+$) CD8$^+$ T cells and effector (HLA-DR$^+$CD38$^+$) CD8$^+$ T cells versus platelet count and globulin levels. **e** Platelet count versus globulin levels. Dots represent individual patients. NS = not significant