

Supplementary material

Supplementary table I:

List of target genes and corresponding antibodies.

| Gene | Gene description | Ensembl | Antibody | Antibody name |
|----------|---|-----------------|-----------|---------------|
| ABL1 | c-abl oncogene 1, non-receptor tyrosine kinase | ENSG00000097007 | HPA027280 | ABL1 |
| ABL1 | c-abl oncogene 1, non-receptor tyrosine kinase | ENSG00000097007 | HPA028409 | ABL1_Ab.2 |
| ACTB | actin beta | ENSG00000075624 | HPA041271 | ACTB |
| ACTB | actin beta | ENSG00000075624 | HPA041264 | ACTB_Ab.2 |
| ACTN2 | actinin, alpha 2 | ENSG00000077522 | HPA008315 | ACTN2 |
| ACTN2 | actinin, alpha 2 | ENSG00000077522 | HPA008417 | ACTN2_Ab.2 |
| AKAP1 | A kinase (PRKA) anchor protein 1 | ENSG00000121057 | HPA008691 | AKAP1 |
| AKAP1 | A kinase (PRKA) anchor protein 1 | ENSG00000121057 | HPA008620 | AKAP1_Ab.2 |
| AKAP1 | A kinase (PRKA) anchor protein 1 | ENSG00000121057 | HPA070750 | AKAP1_Ab.3 |
| ALB | albumin | ENSG00000163631 | HPA031024 | ALB |
| ALB | albumin | ENSG00000163631 | HPA031025 | ALB_Ab.2 |
| ALB | albumin | ENSG00000163631 | HPA001504 | ALB_Ab.3 |
| ALB | albumin | ENSG00000163631 | a-h ALB | ALB_Ab.4 |
| ANKRD2 | ankyrin repeat domain 2 (stretch responsive muscle) | ENSG00000165887 | HPA040842 | ANKRD2 |
| ANKRD2 | ankyrin repeat domain 2 (stretch responsive muscle) | ENSG00000165887 | HPA040884 | ANKRD2_Ab.2 |
| ANXA6 | annexin A6 | ENSG00000197043 | HPA002462 | ANXA6 |
| APOB | apolipoprotein B | ENSG00000084674 | HPA049793 | APOB |
| APOB | apolipoprotein B | ENSG00000084674 | HPA055096 | APOB_Ab.2 |
| APOC1 | apolipoprotein C-I | ENSG00000130208 | HPA051518 | APOC1 |
| APOE | apolipoprotein E | ENSG00000130203 | HPA065539 | APOE |
| APOE | apolipoprotein E | ENSG00000130203 | HPA068768 | APOE_Ab.2 |
| ATP6V1C1 | ATPase, H ⁺ transporting, lysosomal 42kDa, V1 subunit C1 | ENSG00000155097 | HPA024243 | ATP6V1C1 |
| ATRX | alpha thalassemia/mental retardation syndrome X-linked | ENSG00000085224 | HPA001906 | ATRX |
| BASP1 | brain abundant, membrane attached signal protein 1 | ENSG00000176788 | HPA045218 | BASP1 |
| BASP1 | brain abundant, membrane attached signal protein 1 | ENSG00000176788 | HPA050333 | BASP1_Ab.2 |
| C1D | C1D nuclear receptor corepressor | ENSG00000197223 | HPA037413 | C1D |
| C1D | C1D nuclear receptor corepressor | ENSG00000197223 | HPA037588 | C1D_Ab.2 |
| C1QA | complement component 1, q subcomponent, A chain | ENSG00000173372 | HPA002350 | C1QA |
| C3 | complement component 3 | ENSG00000125730 | HPA003563 | C3 |
| C3 | complement component 3 | ENSG00000125730 | HPA020432 | C3_Ab.2 |
| C3a | | | | C3a |
| C4 | complement component 4 | ENSG00000224389 | HPA046356 | C4 |

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|--------|---|-----------------|-----------|-------------|
| C4 | complement component 4 | ENSG00000224389 | HPA048287 | C4_Ab.2 |
| C4 | complement component 4 | ENSG00000224389 | HPA050103 | C4_Ab.3 |
| C4B | complement component 4B | ENSG00000224389 | HPA046356 | C4B |
| C4B | complement component 4B | ENSG00000224389 | HPA048287 | C4B_Ab.2 |
| C4B | complement component 4B | ENSG00000224389 | HPA050103 | C4B_Ab.3 |
| C4BPA | complement component 4 binding protein, alpha | ENSG00000123838 | HPA000926 | C4BPA |
| C4BPA | complement component 4 binding protein, alpha | ENSG00000123838 | HPA001578 | C4BPA_Ab.2 |
| C4BPA | complement component 4 binding protein, alpha | ENSG00000123838 | HPA001845 | C4BPA_Ab.3 |
| C4BPA | complement component 4 binding protein, alpha | ENSG00000123838 | HPA001797 | C4BPA_Ab.4 |
| C5 | complement component 5 | ENSG00000106804 | HPA029339 | C5 |
| C5 | complement component 5 | ENSG00000106804 | HPA001353 | C5_Ab.2 |
| CA2 | carbonic anhydrase II | ENSG00000104267 | HPA071085 | CA2 |
| CA3 | carbonic anhydrase III, muscle specific | ENSG00000164879 | HPA021775 | CA3 |
| CA3 | carbonic anhydrase III, muscle specific | ENSG00000164879 | CA3.1 | CA3_Ab.2 |
| CA3 | carbonic anhydrase III, muscle specific | ENSG00000164879 | CA3.2 | CA3_Ab.3 |
| CA3 | carbonic anhydrase III, muscle specific | ENSG00000164879 | HPA026700 | CA3_Ab.4 |
| CAPN6 | calpain 6 | ENSG00000077274 | HPA040383 | CAPN6 |
| CAPN6 | calpain 6 | ENSG00000077274 | HPA040259 | CAPN6_Ab.2 |
| CASQ2 | calsequestrin 2 (cardiac muscle) | ENSG00000118729 | HPA027285 | CASQ2 |
| CASQ2 | calsequestrin 2 (cardiac muscle) | ENSG00000118729 | HPA055298 | CASQ2_Ab.2 |
| CCL2 | chemokine (C-C motif) ligand 2 | ENSG00000108691 | HPA019163 | CCL2 |
| CCNB1 | cyclin B1 | ENSG00000134057 | HPA030740 | CCNB1 |
| CCNB1 | cyclin B1 | ENSG00000134057 | HPA030742 | CCNB1_Ab.2 |
| CCNB1 | cyclin B1 | ENSG00000134057 | HPA030741 | CCNB1_Ab.3 |
| CD68 | CD68 molecule | ENSG00000129226 | HPA048982 | CD68 |
| CDK14 | cyclin-dependent kinase 14 | ENSG00000058091 | HPA015267 | CDK14 |
| CDK14 | cyclin-dependent kinase 14 | ENSG00000058091 | HPA021655 | CDK14_Ab.2 |
| CDK14 | cyclin-dependent kinase 14 | ENSG00000058091 | HPA065097 | CDK14_Ab.3 |
| CFH | complement factor H | ENSG00000000971 | HPA005551 | CFH |
| CFH | complement factor H | ENSG00000000971 | HPA049176 | CFH_Ab.2 |
| CFH | complement factor H | ENSG00000000971 | HPA053326 | CFH_Ab.3 |
| CGN | cingulin | ENSG00000143375 | HPA027586 | CGN |
| CGN | cingulin | ENSG00000143375 | HPA027657 | CGN_Ab.2 |
| CHKA | choline kinase alpha | ENSG00000110721 | HPA024153 | CHKA |
| CK | creatine kinase | ENSG00000166165 | HPA001254 | CK |
| COL1A1 | collagen, type I, alpha 1 | ENSG00000108821 | HPA011795 | COL1A1_Ab.2 |
| COL1A1 | collagen, type I, alpha 1 | ENSG00000108821 | HPA008405 | COL1A1 |

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|--------------|---|-----------------|-----------|-------------------|
| COL6A1 | collagen, type VI, alpha 1 | ENSG00000142156 | HPA019142 | COL6A1 |
| COL6A1 | collagen, type VI, alpha 1 | ENSG00000142156 | HPA029401 | COL6A1_Ab.2 |
| COL6A1 | collagen, type VI, alpha 1 | ENSG00000142156 | HPA029402 | COL6A1_Ab.3 |
| CP | ceruloplasmin (ferroxidase) | ENSG00000047457 | HPA001834 | CP |
| CP | ceruloplasmin (ferroxidase) | ENSG00000047457 | HPA002737 | CP_Ab.2 |
| DES | desmin | ENSG00000175084 | HPA018803 | DES |
| ENO3 | enolase 3 (beta, muscle) | ENSG00000108515 | HPA000793 | ENO3 |
| ETFA | electron-transfer-flavoprotein, alpha polypeptide | ENSG00000140374 | HPA018990 | ETFA |
| ETFA | electron-transfer-flavoprotein, alpha polypeptide | ENSG00000140374 | HPA024089 | ETFA_Ab.2 |
| ETFA | electron-transfer-flavoprotein, alpha polypeptide | ENSG00000140374 | HPA018996 | ETFA_Ab.3 |
| ETFA | electron-transfer-flavoprotein, alpha polypeptide | ENSG00000140374 | HPA018993 | ETFA_Ab.4 |
| ETFB | electron-transfer-flavoprotein, beta polypeptide | ENSG00000105379 | HPA018910 | ETFB |
| ETFB | electron-transfer-flavoprotein, beta polypeptide | ENSG00000105379 | HPA018921 | ETFB_Ab.2 |
| ETFB | electron-transfer-flavoprotein, beta polypeptide | ENSG00000105379 | HPA018923 | ETFB_Ab.3 |
| ETFB | electron-transfer-flavoprotein, beta polypeptide | ENSG00000105379 | HPA018898 | ETFB_Ab.4 |
| F13B | coagulation factor XIII, B polypeptide | ENSG00000143278 | HPA003827 | F13B |
| F13B | coagulation factor XIII, B polypeptide | ENSG00000143278 | HPA027563 | F13B_Ab.2 |
| F13B | coagulation factor XIII, B polypeptide | ENSG00000143278 | HPA007384 | F13B_Ab.3 |
| F13B | coagulation factor XIII, B polypeptide | ENSG00000143278 | HPA052139 | F13B_Ab.4 |
| F7 | coagulation factor VII (serum prothrombin conversion accelerator) | ENSG00000057593 | HPA004826 | F7 |
| F7 | coagulation factor VII (serum prothrombin conversion accelerator) | ENSG00000057593 | HPA063808 | F7_Ab.2 |
| FABP4 | fatty acid binding protein 4, adipocyte | ENSG00000170323 | HPA002188 | FABP4 |
| FAM47E-STBD1 | FAM47E-STBD1 readthrough | ENSG00000118804 | HPA011952 | FAM47E-STBD1 |
| FAM47E-STBD1 | FAM47E-STBD1 readthrough | ENSG00000118804 | HPA012849 | FAM47E-STBD1_Ab.2 |
| FH | fumarate hydratase | ENSG00000091483 | HPA025770 | FH |
| FH | fumarate hydratase | ENSG00000091483 | HPA027341 | FH_Ab.2 |
| FN1 | fibronectin 1 | ENSG00000115414 | HPA027066 | FN |
| GCC1 | GRIP and coiled-coil domain containing 1 | ENSG00000179562 | HPA019369 | GCC1 |
| GCC1 | GRIP and coiled-coil domain containing 1 | ENSG00000179562 | HPA021323 | GCC1_Ab.2 |
| GPD1 | glycerol-3-phosphate dehydrogenase 1 (soluble) | ENSG00000167588 | HPA044620 | GPD1 |
| GSN | gelsolin | ENSG00000148180 | HPA070538 | GSN |
| H6PD | hexose-6-phosphate dehydrogenase (glucose 1-dehydrogenase) | ENSG00000049239 | HPA004824 | H6PD |

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| H6PD | hexose-6-phosphate dehydrogenase (glucose 1-dehydrogenase) | ENSG00000049239 | HPA005440 | H6PD_Ab.2 |
| HDAC2 | histone deacetylase 2 | ENSG00000196591 | HPA011727 | HDAC2 |
| HDAC2 | histone deacetylase 2 | ENSG00000196591 | HPA012040 | HDAC2_Ab.2 |
| HLA-DQB1 | major histocompatibility complex, class II, DQ beta 1 | ENSG00000179344 | HPA013667 | HLA-DQB1 |
| HLA-DRB5 | major histocompatibility complex, class II, DR beta 5, | ENSG00000196126 | HPA043151 | HLA-DRB5_Ab.1 |
| IFI30 | interferon, gamma-inducible protein 30 | ENSG00000216490 | HPA026650 | IFI30 |
| ITGA2B | integrin, alpha 2b | ENSG00000005961 | HPA031170 | ITGA2B |
| ITGA2B | integrin, alpha 2b | ENSG00000005961 | HPA031168 | ITGA2B_Ab.2 |
| ITGA2B | integrin, alpha 2b | ENSG00000005961 | HPA031169 | ITGA2B_Ab.3 |
| ITGA2B | integrin, alpha 2b | ENSG00000005961 | HPA031171 | ITGA2B_Ab.4 |
| JAM3 | junctional adhesion molecule 3 | ENSG00000166086 | HPA003417 | JAM3 |
| JAM3 | junctional adhesion molecule 3 | ENSG00000166086 | HPA050434 | JAM3_Ab.2 |
| KRT10 | keratin 10 | ENSG00000186395 | HPA012014 | KRT10 |
| LAMC1 | laminin, gamma 1 (formerly LAMB2) | ENSG00000135862 | HPA001908 | LAMC1 |
| LAMC1 | laminin, gamma 1 (formerly LAMB2) | ENSG00000135862 | HPA001909 | LAMC1_Ab.2 |
| LCP1 | lymphocyte cytosolic protein 1 (L-plastin) | ENSG00000136167 | HPA019493 | LCP1 |
| LDHB | lactate dehydrogenase B | ENSG00000111716 | HPA019007 | LDHB |
| LMOD1 | leiomodoin 1 (smooth muscle) | ENSG00000163431 | HPA028435 | LMOD1 |
| LMOD1 | leiomodoin 1 (smooth muscle) | ENSG00000163431 | HPA030097 | LMOD1_Ab.2 |
| LMOD1 | leiomodoin 1 (smooth muscle) | ENSG00000163431 | HPA028325 | LMOD1_Ab.3 |
| LOXL1 | lysyl oxidase-like 1 | ENSG00000129038 | HPA042111 | LOXL1 |
| LOXL1 | lysyl oxidase-like 1 | ENSG00000129038 | HPA063583 | LOXL1_Ab.2 |
| LST1 | leukocyte specific transcript 1 | ENSG00000204482 | HPA043725 | LST1 |
| LST1 | leukocyte specific transcript 1 | ENSG00000204482 | HPA050642 | LST1_Ab.2 |
| LTBP4 | latent transforming growth factor beta binding protein 4 | ENSG00000090006 | HPA040788 | LTBP4 |
| LTBP4 | latent transforming growth factor beta binding protein 4 | ENSG00000090006 | HPA070319 | LTBP4_Ab.2 |
| MAP4 | microtubule-associated protein 4 | ENSG00000047849 | HPA038150 | MAP4 |
| MAP4 | microtubule-associated protein 4 | ENSG00000047849 | HPA038149 | MAP4_Ab.2 |
| MB | myoglobin | ENSG00000198125 | HPA003123 | MB |
| MDH2 | malate dehydrogenase 2, NAD (mitochondrial) | ENSG00000146701 | HPA019848 | MDH2 |
| MDH2 | malate dehydrogenase 2, NAD (mitochondrial) | ENSG00000146701 | HPA019714 | MDH2_Ab2 |
| MDH2 | malate dehydrogenase 2, NAD (mitochondrial) | ENSG00000146701 | HPA026720 | MDH2_Ab.3 |
| MDH2 | malate dehydrogenase 2, NAD (mitochondrial) | ENSG00000146701 | HPA019716 | MDH2_Ab.4 |
| MGP | matrix Gla protein | ENSG00000111341 | HPA013949 | MGP |
| MGP | matrix Gla protein | ENSG00000111341 | HPA014274 | MGP_Ab.2 |

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| MID1IP1 | MID1 interacting protein 1 | ENSG00000165175 | HPA038816 | MID1IP1 |
| MMP9 | matrix metalloproteinase 9 | ENSG00000100985 | HPA001238 | MMP9 |
| MMP9 | matrix metalloproteinase 9 | ENSG00000100985 | HPA001238 | MMP9_Ab.2 |
| MMP9 | matrix metalloproteinase 9 | ENSG00000100985 | HPA063909 | MMP9_Ab.3 |
| MRPL45 | mitochondrial ribosomal protein L45 | ENSG00000278845 | HPA023373 | MRPL45 |
| MRPL45 | mitochondrial ribosomal protein L45 | ENSG00000278845 | HPA023385 | MRPL45_Ab.2 |
| MYH3 | myosin, heavy chain 3, skeletal muscle | ENSG00000109063 | HPA021808 | MYH3 |
| MYL6 | myosin, light polypeptide 6 | ENSG00000092841 | HPA042220 | MYL6_Ab.1 |
| MYL3 | myosin, light chain 3, alkali; ventricular, skeletal, slow | ENSG00000160808 | HPA016564 | MYL3 |
| MYOM3 | myomesin 3 | ENSG00000142661 | HPA028132 | MYOM3 |
| MYOM3 | myomesin 3 | ENSG00000142661 | HPA029752 | MYOM3_Ab.2 |
| NES | nestin | ENSG00000132688 | HPA007007 | NES |
| NES | nestin | ENSG00000132688 | HPA026111 | NES_Ab.2 |
| NES | nestin | ENSG00000132688 | HPA006286 | NES_Ab.3 |
| NOP58 | NOP58 ribonucleoprotein | ENSG00000055044 | HPA018472 | NOP58 |
| NOP58 | NOP58 ribonucleoprotein | ENSG00000055044 | HPA021062 | NOP58_Ab.2 |
| NUMA1 | nuclear mitotic apparatus protein 1 | ENSG00000137497 | HPA019859 | NUMA1 |
| NUMA1 | nuclear mitotic apparatus protein 1 | ENSG00000137497 | HPA019841 | NUMA1_Ab.2 |
| NUMA1 | nuclear mitotic apparatus protein 1 | ENSG00000137497 | HPA029912 | NUMA1_Ab.3 |
| PARK7 | parkinson protein 7 | ENSG00000116288 | HPA004190 | PARK7 |
| PARK7 | parkinson protein 7 | ENSG00000116288 | HPA067468 | PARK7_Ab.2 |
| PCM1 | pericentriolar material 1 | ENSG00000078674 | HPA004944 | PCM1 |
| PCM1 | pericentriolar material 1 | ENSG00000078674 | HPA023375 | PCM1_Ab.2 |
| PCM1 | pericentriolar material 1 | ENSG00000078674 | HPA023370 | PCM1_Ab.3 |
| PCM1 | pericentriolar material 1 | ENSG00000078674 | HPA023374 | PCM1_Ab.4 |
| PCMT1 | protein-L-isoaspartate (D-aspartate) O-methyltransferase | ENSG00000120265 | HPA003239 | PCMT1 |
| PCMT1 | protein-L-isoaspartate (D-aspartate) O-methyltransferase | ENSG00000120265 | HPA070800 | PCMT1_Ab.2 |
| PDZK1 | PDZ domain containing 1 | ENSG00000174827 | HPA005755 | PDZK1 |
| PDZK1 | PDZ domain containing 1 | ENSG00000174827 | HPA006155 | PDZK1 |
| PEBP4 | phosphatidylethanolamine-binding protein 4 | ENSG00000134020 | HPA025064 | PEBP4 |
| PGM1 | phosphoglucomutase 1 | ENSG00000079739 | HPA024190 | PGM1 |
| PGM1 | phosphoglucomutase 1 | ENSG00000079739 | HPA024637 | PGM1_Ab.2 |
| PHKG1 | phosphorylase kinase, gamma 1 (muscle) | ENSG00000164776 | HPA012057 | PHKG1 |
| POLR2A | polymerase (RNA) II (DNA directed) polypeptide A | ENSG00000181222 | HPA021563 | POLR2A |
| POLR2A | polymerase (RNA) II (DNA directed) polypeptide A | ENSG00000181222 | HPA023023 | POLR2A_Ab.2 |
| POLR2A | polymerase (RNA) II (DNA directed) polypeptide A | ENSG00000181222 | HPA023294 | POLR2A_Ab.3 |
| POLR2A | polymerase (RNA) II (DNA directed) polypeptide A, 220kDa | ENSG00000181222 | HPA053012 | POLR2A_Ab.4 |

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|----------|---|-----------------|-----------|---------------|
| POLR2A | polymerase (RNA) II (DNA directed) polypeptide A | ENSG00000181222 | HPA023029 | POLR2A_Ab.5 |
| POSTN | periostin, osteoblast specific factor | ENSG00000133110 | HPA011807 | POSTN |
| POSTN | periostin, osteoblast specific factor | ENSG00000133110 | HPA012306 | POSTN_Ab.2 |
| PPM1F | protein phosphatase, Mg ²⁺ /Mn ²⁺ dependent, 1F | ENSG00000100034 | HPA030989 | PPM1F |
| PPM1F | protein phosphatase, Mg ²⁺ /Mn ²⁺ dependent, 1F | ENSG00000100034 | HPA030990 | PPM1F_Ab.2 |
| PPM1F | protein phosphatase, Mg ²⁺ /Mn ²⁺ dependent, 1F | ENSG00000100034 | HPA000821 | PPM1F_Ab.3 |
| PTCD3 | pentatricopeptide repeat domain 3 | ENSG00000132300 | HPA041154 | PTCD3 |
| PTCD3 | pentatricopeptide repeat domain 3 | ENSG00000132300 | HPA041382 | PTCD3_Ab.2 |
| RAD21 | RAD21 homolog (S. pombe) | ENSG00000164754 | HPA020044 | RAD21 |
| RAD21 | RAD21 homolog (S. pombe) | ENSG00000164754 | HPA073277 | RAD21_Ab.2 |
| RBL2 | retinoblastoma-like 2 (p130) | ENSG00000103479 | HPA019703 | RBL2 |
| RBL2 | retinoblastoma-like 2 (p130) | ENSG00000103479 | HPA056059 | RBL2_Ab.2 |
| RBM6 | RNA binding motif protein 6 | ENSG00000004534 | HPA026272 | RBM6 |
| RBM6 | RNA binding motif protein 6 | ENSG00000004534 | HPA027164 | RBM6_Ab.2 |
| RBM6 | RNA binding motif protein 6 | ENSG00000004534 | HPA026280 | RBM6_Ab.3 |
| RBM6 | RNA binding motif protein 6 | ENSG00000004534 | HPA026285 | RBM6_Ab.4 |
| RELB | v-rel avian reticuloendotheliosis viral oncogene homolog B | ENSG00000104856 | HPA011339 | RELB |
| RELB | v-rel avian reticuloendotheliosis viral oncogene homolog B | ENSG00000104856 | HPA040506 | RELB_Ab.2 |
| RELB | v-rel avian reticuloendotheliosis viral oncogene homolog B | ENSG00000104856 | HPA011985 | RELB_Ab.3 |
| RELB | v-rel avian reticuloendotheliosis viral oncogene homolog B | ENSG00000104856 | HPA048996 | RELB_Ab.4 |
| RTN3 | reticulon 3 | ENSG00000133318 | HPA015649 | RTN3 |
| RTN3 | reticulon 3 | ENSG00000133318 | HPA015650 | RTN3_Ab.2 |
| RTN3 | reticulon 3 | ENSG00000133318 | HPA015959 | RTN3_Ab.3 |
| S100A6 | S100 calcium binding protein A6 | ENSG00000197956 | HPA007575 | S100A6 |
| S100A6 | S100 calcium binding protein A6 | ENSG00000197956 | HPA008060 | S100A6_Ab.2 |
| SCAF4 | SR-related CTD-associated factor 4 | ENSG00000156304 | HPA018319 | SCAF4 |
| SCAF4 | SR-related CTD-associated factor 4 | ENSG00000156304 | HPA018668 | SCAF4_Ab.2 |
| SCAF4 | SR-related CTD-associated factor 4 | ENSG00000156304 | HPA021504 | SCAF4_Ab.3 |
| SCAF4 | SR-related CTD-associated factor 4 | ENSG00000156304 | HPA028807 | SCAF4_Ab.4 |
| SERPINA1 | serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 1 | ENSG00000197249 | HPA000927 | SERPINA1 |
| SERPINA1 | serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 1 | ENSG00000197249 | HPA001292 | SERPINA1_Ab.2 |
| SERPINA1 | serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 1 | ENSG00000197249 | HPA000927 | SERPINA1_Ab.3 |
| SERPINA1 | serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 1 | ENSG00000197249 | HPA001292 | SERPINA1_Ab.4 |

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| SERPINE1 | serpin peptidase inhibitor, clade E (nexin, plasminogen activator inhibitor type 1), member 1 | ENSG00000106366 | HPA024527 | SERPINE1 |
| SERPINE1 | serpin peptidase inhibitor, clade E (nexin, plasminogen activator inhibitor type 1), member 1 | ENSG00000106366 | HPA045409 | SERPINE1_Ab.2 |
| SPARC | secreted protein, acidic, cysteine-rich (osteonectin) | ENSG00000113140 | HPA002989 | SPARC |
| SPARC | secreted protein, acidic, cysteine-rich (osteonectin) | ENSG00000113140 | HPA003020 | SPARC_Ab.2 |
| SPARC | secreted protein, acidic, cysteine-rich (osteonectin) | ENSG00000113140 | HPA007369 | SPARC_Ab.3 |
| SPP1 | secreted phosphoprotein 1 | ENSG00000118785 | HPA027541 | SPP1 |
| SPP1 | secreted phosphoprotein 1 | ENSG00000118785 | HPA027540 | SPP1_Ab. |
| STUB1 | STIP1 homology and U-box containing protein 1, E3 ubiquitin protein ligase | ENSG00000103266 | HPA041222 | STUB1 |
| STUB1 | STIP1 homology and U-box containing protein 1, E3 ubiquitin protein ligase | ENSG00000103266 | HPA043531 | STUB1_Ab. |
| SUCLA2 | succinate-CoA ligase, ADP-forming, beta subunit | ENSG00000136143 | HPA039435 | SUCLA2 |
| SUCLA2 | succinate-CoA ligase, ADP-forming, beta subunit | ENSG00000136143 | HPA039536 | SUCLA2_Ab. |
| SUCLA2 | succinate-CoA ligase, ADP-forming, beta subunit | ENSG00000136143 | HPA061528 | SUCLA2_Ab. |
| SUN1 | Sad1 and UNC84 domain containing 1 | ENSG00000164828 | HPA008345 | SUN1 |
| SUN1 | Sad1 and UNC84 domain containing 1 | ENSG00000164828 | HPA008461 | SUN1_Ab.2 |
| SUN1 | Sad1 and UNC84 domain containing 1 | ENSG00000164828 | HPA008486 | SUN1_Ab.3 |
| TCEA3 | transcription elongation factor A (SII), 3 | ENSG00000204219 | HPA029267 | TCEA3 |
| TCEA3 | transcription elongation factor A (SII), 3 | ENSG00000204219 | HPA044960 | TCEA3_Ab.2 |
| TCEA3 | transcription elongation factor A (SII), 3 | ENSG00000204219 | HPA055811 | TCEA3_Ab. |
| TF | transferrin | ENSG00000091513 | HPA001527 | TF |
| TF | transferrin | ENSG00000091513 | HPA005692 | TF_Ab.2 |
| TGOLN2 | trans-golgi network protein 2 | ENSG00000152291 | HPA012723 | TGOLN2 |
| TGOLN2 | trans-golgi network protein 2 | ENSG00000152291 | HPA012609 | TGOLN2_Ab.2 |
| TGOLN2 | trans-golgi network protein 2 | ENSG00000152291 | HPA012913 | TGOLN2_Ab.3 |
| TIMP1 | TIMP metalloproteinase inhibitor 1 | ENSG00000102265 | HPA053417 | TIMP1 |
| TMC1 | transmembrane channel-like 1 | ENSG00000165091 | HPA044166 | TMC1 |
| TMC1 | transmembrane channel-like 1 | ENSG00000165091 | HPA046773 | TMC1_Ab.2 |
| TMEM214 | transmembrane protein 214 | ENSG00000119777 | HPA034551 | TMEM214 |
| TNC | tenascin C | ENSG00000041982 | HPA004823 | TNC |
| TNFRSF1B | tumor necrosis factor receptor superfamily, member 1B | ENSG00000028137 | HPA004796 | TNFRSF1B |
| TNNT1 | tropomyosin T type 1 (skeletal, slow) | ENSG00000105048 | HPA058448 | TNNT1 |

| | | | | |
|-------|--|-----------------|-----------|------------|
| TNNT2 | troponin T type 2 (cardiac) | ENSG00000118194 | HPA015774 | TNNT2 |
| TNNT2 | troponin T type 2 (cardiac) | ENSG00000118194 | HPA017888 | TNNT2_Ab.2 |
| TNNT3 | troponin T type 3 (skeletal, fast) | ENSG00000130595 | HPA037810 | TNNT3 |
| TNNT3 | troponin T type 3 (skeletal, fast) | ENSG00000130595 | HPA056909 | TNNT3_Ab.2 |
| TTN | titin | ENSG00000155657 | HPA007042 | TTN |
| TTN | titin | ENSG00000155657 | HPA030048 | TTN_Ab.2 |
| UBE2K | ubiquitin-conjugating enzyme E2K | ENSG00000078140 | HPA028869 | UBE2K |
| USP25 | ubiquitin specific peptidase 25 | ENSG00000155313 | HPA018297 | USP25 |
| USP25 | ubiquitin specific peptidase 25 | ENSG00000155313 | HPA024142 | USP25_Ab.2 |
| VAMP5 | vesicle-associated membrane protein 5 | ENSG00000168899 | HPA035082 | VAMP5 |
| VIM | vimentin | ENSG00000026025 | HPA001762 | VIM |
| XRCC4 | X-ray repair complementing defective repair in Chinese hamster cells 4 | ENSG00000152422 | HPA006801 | XRCC4 |
| XRCC4 | X-ray repair complementing defective repair in Chinese hamster cells 4 | ENSG00000152422 | HPA006921 | XRCC4_Ab.2 |
| XRCC4 | X-ray repair complementing defective repair in Chinese hamster cells 4 | ENSG00000152422 | HPA051538 | XRCC4_Ab.3 |

Supplementary table II:

Overview of the number of patients and the min, max, mean and median of the age in the different cohorts, after balancing ages of the samples in each cohort. The samples were divided after youngest non-ambulant patient to oldest ambulant patient.

| Cohort | Ambulation | Min age | Max age | Mean age \pm SD | Median | No. of samples |
|--------------------|-------------------|----------------|----------------|-------------------------------------|---------------|-----------------------|
| LUMC serum | AMB | 6.74 | 15.40 | 9.26 \pm 2.56 | 8.31 | 28 |
| | NON | 6.69 | 15.36 | 12.35 \pm 1.98 | 12.46 | 40 |
| | CON | 6.25 | 11.10 | 8.21 \pm 1.72 | 8.03 | 14 |
| | PART | 6.98 | 11.70 | 9.70 \pm 1.38 | 9.93 | 16 |
| | FVC | 5.50 | 19.20 | 10.74 \pm 3.40 | 10.30 | 89 |
| UCL serum | AMB | 8.16 | 15.34 | 10.62 \pm 1.96 | 10.17 | 24 |
| | NON | 8.16 | 13.99 | 11.81 \pm 1.59 | 12.18 | 25 |
| | CON | 19.00 | 48.00 | 32.22 \pm 9.71 | 32.00 | 9 |
| | FVC | 2.36 | 15.40 | 9.65 \pm 3.57 | 10.10 | 24 |
| UNEW serum | AMB | 10.0 | 14.86 | 12.08 \pm 1.51 | 11.64 | 28 |
| | NON | 9.90 | 14.61 | 12.95 \pm 1.40 | 13.17 | 11 |
| | CON | 3.33 | 75.75 | 42.76 \pm 19.30 | 44.50 | 15 |
| | FVC | 5.74 | 20.07 | 12.2 \pm 4.68 | 12.28 | 37 |
| UCL plasma | AMB | 8.21 | 15.34 | 10.67 \pm 1.89 | 10.16 | 25 |
| | NON | 8.16 | 14.84 | 11.97 \pm 1.76 | 12.22 | 35 |
| | CON | 19.00 | 48.00 | 32.22 \pm 9.71 | 32.00 | 9 |
| | FVC | 5.10 | 15.40 | 9.72 \pm 3.49 | 9.70 | 27 |
| UNEW plasma | AMB | 10.0 | 14.86 | 12.34 \pm 1.53 | 12.15 | 22 |
| | NON | 9.90 | 14.61 | 13.00 \pm 1.55 | 13.40 | 9 |
| | CON | 3.32 | 75.75 | 43.36 \pm 19.48 | 46.11 | 15 |
| | FVC | 5.10 | 21.40 | 12.27 \pm 4.46 | 12.50 | 37 |

Supplementary table III: Protein abundance difference in DMD patients vs. healthy individuals (LUMC and UCL samples) and female carriers (UNEW sample collection) estimate with multiple antibodies. The discrimination power is represented by *P*-values.

| Antibody | LUMC serum | UCL serum | UCL plasma | UNEW serum | UNEW plasma |
|-------------------|-------------------|------------------|-------------------|-------------------|--------------------|
| CA3 | 2.6e-12 | 1.2e-6 | 1.1e-6 | 5.1e-9 | 8.6e-6 |
| CA3_Ab2 | 3.5e-6 | 1.1e-6 | 6.8e-7 | 2.6e-6 | 5.7e-5 |
| CA3_Ab3 | 6.3e-8 | 1.4e-3 | 5.9e-2 | 1.9e-4 | 1.7e-1 |
| CA3_Ab4 | 5.9e-2 | 5.6e-1 | 1.8e-2 | 4.8e-1 | 8.8e-1 |
| MDH2 | 2.8e-12 | 7.8e-5 | 1.3e-4 | 4.2e-8 | 5.9e-6 |
| MDH2_Ab2 | 2.5e-1 | 1.5e-1 | 7.7e-4 | 4.9e-1 | 7.3e-1 |
| MDH2_Ab3 | 7.7e-1 | 6.0e-1 | 2.7e-1 | 9.7e-1 | 4.5e-1 |
| MDH2_Ab4 | 5.8e-3 | 5.0e-2 | 3.3e-3 | 4.1e-2 | 3.9e-3 |
| ETFA | 4.2e-11 | 4.0e-6 | 7.8e-6 | 2.9e-7 | 1.7e-6 |
| ETFA_Ab2 | 8.2e-1 | 2.9e-1 | 1.6e-2 | 2.2e-1 | 4.5e-2 |
| ETFA_Ab3 | 2.2e-2 | 7.8e-2 | 6.5e-1 | 7.3e-2 | 1.0e-2 |
| ETFA_Ab4 | 3.6e-4 | 2.2e-2 | 1.7e-2 | 3.7e-1 | 5.4e-1 |
| TNNT3 | 2.7e-9 | 5.5e-5 | 4.0e-3 | 2.6e-5 | 7.8e-4 |
| TNNT3_Ab2 | 5.7e-1 | 5.7e-2 | 4.2e-1 | 9.5e-2 | 3.5e-1 |
| NES | 6.1e-10 | 1.2e-6 | 1.1e-6 | 2.5e-5 | 2.1e-5 |
| NES_Ab2 | 6.0e-4 | 2.3e-4 | 6.0e-3 | 7.1e-8 | 3.7e-5 |
| NES_Ab3 | 8.9e-3 | 7.8e-1 | 3.1e-4 | 9.9e-4 | 2.0e-1 |
| COL1A1 | 4.7e-5 | 5.5e-5 | 3.8e-2 | 3.7e-4 | 2.3e-4 |
| COL1A1_Ab2 | 3.34e-1 | 6.3e-1 | 5.3e-2 | 9.3e-1 | 2.6e-1 |
| MAP4 | 5.6e-6 | 4.4e-2 | 9.2e-4 | 5.9e-7 | 5.8e-4 |
| MAP4_Ab2 | 3.6e-6 | 3.3e-3 | 1.9e-3 | 2.8e-3 | 2.0e-3 |

Supplementary table IV: Biomarker abundance trajectories before and after LoA.

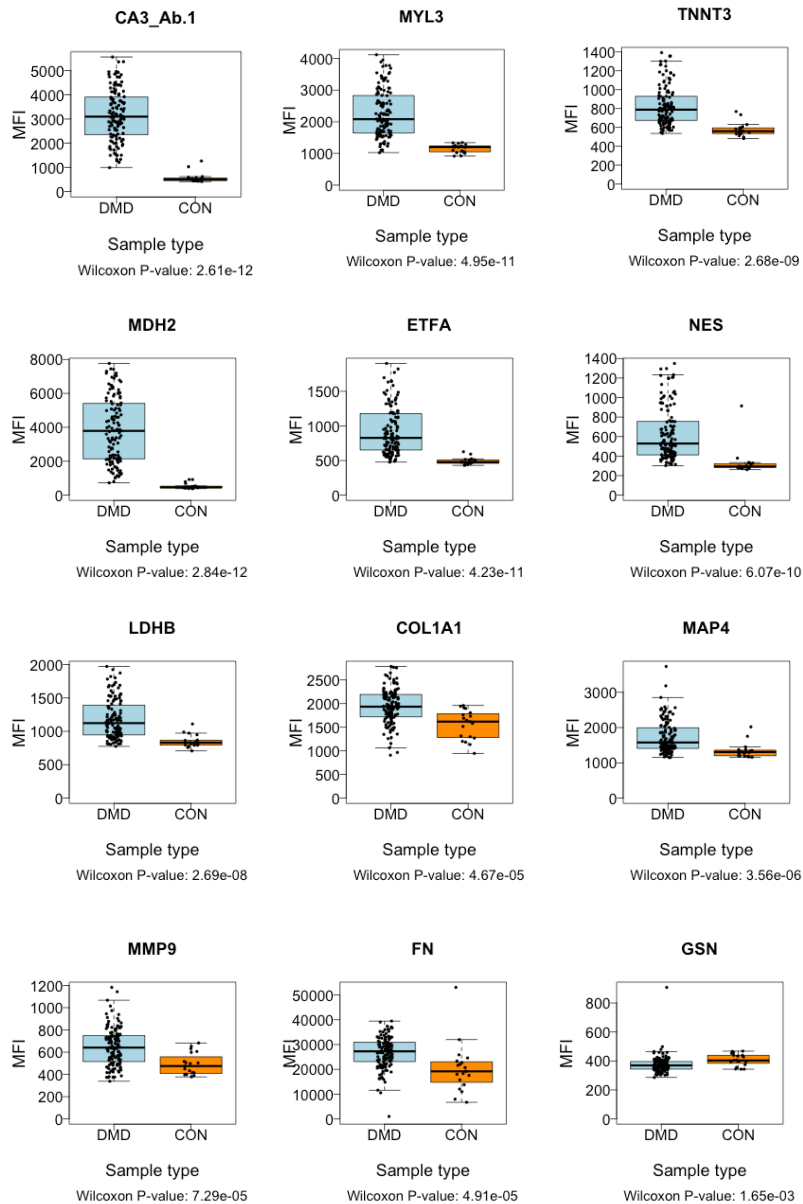
Regression coefficient and P-values estimated by Wald test are estimated for the analysis of LUMC serum and UCL plasma.

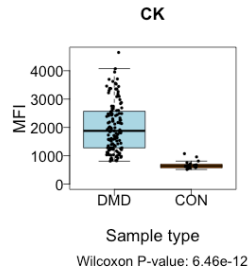
| | LUMCS | | | | UCLP | | | |
|-----------------|------------------------|---------|------------------------|---------|------------------------|---------|------------------------|---------|
| | Before LoA | | After LoA | | Before LoA | | After LoA | |
| | Regression coefficient | P-value | Regression coefficient | P-value | Regression coefficient | P-value | Regression coefficient | P-value |
| CA3_Ab.1 | -241.5 | 0,16 | -317.7 | 4,4E-03 | -212.7 | 0,44 | -216.9 | 3,2E-01 |
| CA3_Ab.2 | -65.55 | 0,64 | -208.4 | 9,5E-03 | 41.46 | 0,76 | -245.5 | 3,3E-01 |
| CK | -378.3 | 1,0E-03 | -148.3 | 1,9E-03 | -408.6 | 3,0E-01 | -356.5 | 6,0E-02 |
| MYL3 | -279.2 | 7,0E-03 | -115.7 | 2,4E-02 | -363.6 | 9,4E-03 | -127.8 | 1,3E-01 |
| MDH2 | -714.5 | 2,4E-03 | -384.9 | 1,1E-03 | -466 | 1,2E-01 | -456.9 | 4,2E-03 |
| ETFA | -129.2 | 2,0E-04 | -52.85 | 2,3E-04 | -105.1 | 1,2E-01 | -43.47 | 2,9E-01 |
| NES | -104.2 | 2,0E-03 | -31.52 | 2,0E-02 | -13.82 | 7,7E-01 | -35.45 | 2,9E-01 |
| TNNT3 | -49.53 | 0,1 | -43.17 | 2,0E-02 | -87.56 | 0,06 | -43.58 | 4,8E-02 |
| LDHB | -123.3 | 9,4E-03 | -1.443 | 9,7E-01 | -180 | 2,5E-01 | 4.053 | 9,8E-01 |
| COL1A1 | 75.87 | 0,33 | -55.37 | 2,8E-01 | -1.589 | 0,97 | -14.7 | 8,8E-01 |
| MAP4 | -213.3 | 2,9E-02 | -27.51 | 5,8E-01 | -37.12 | 5,6E-01 | 83.02 | 1,5E-01 |

Supplementary figure 1:

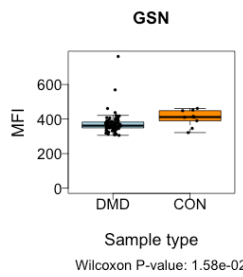
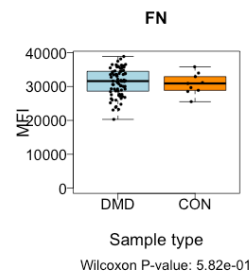
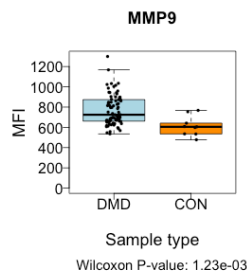
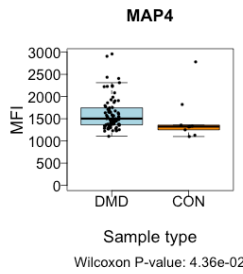
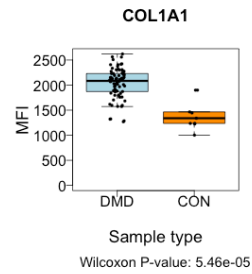
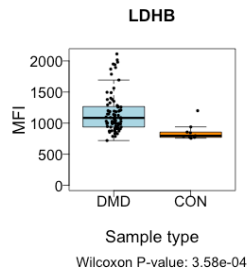
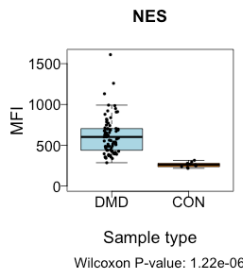
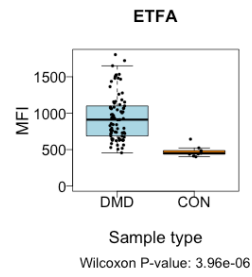
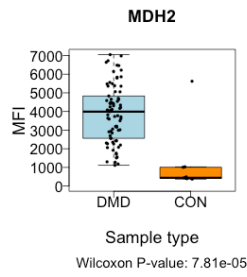
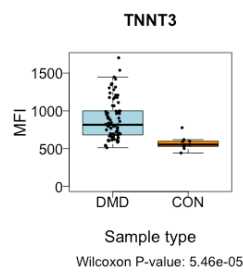
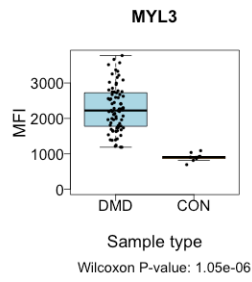
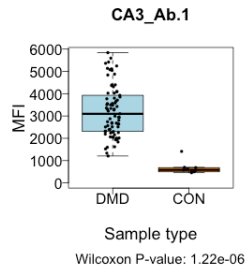
Biomarker abundance analysed in a) LUMC serum, b) UCL serum, c) UCL plasma, d) UNEW serum and e) UNEW plasma. The blue boxes represent the patients (DMD) and the orange boxes represent the healthy individuals (CON).

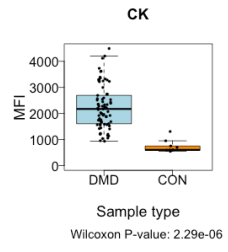
a) LUMC serum



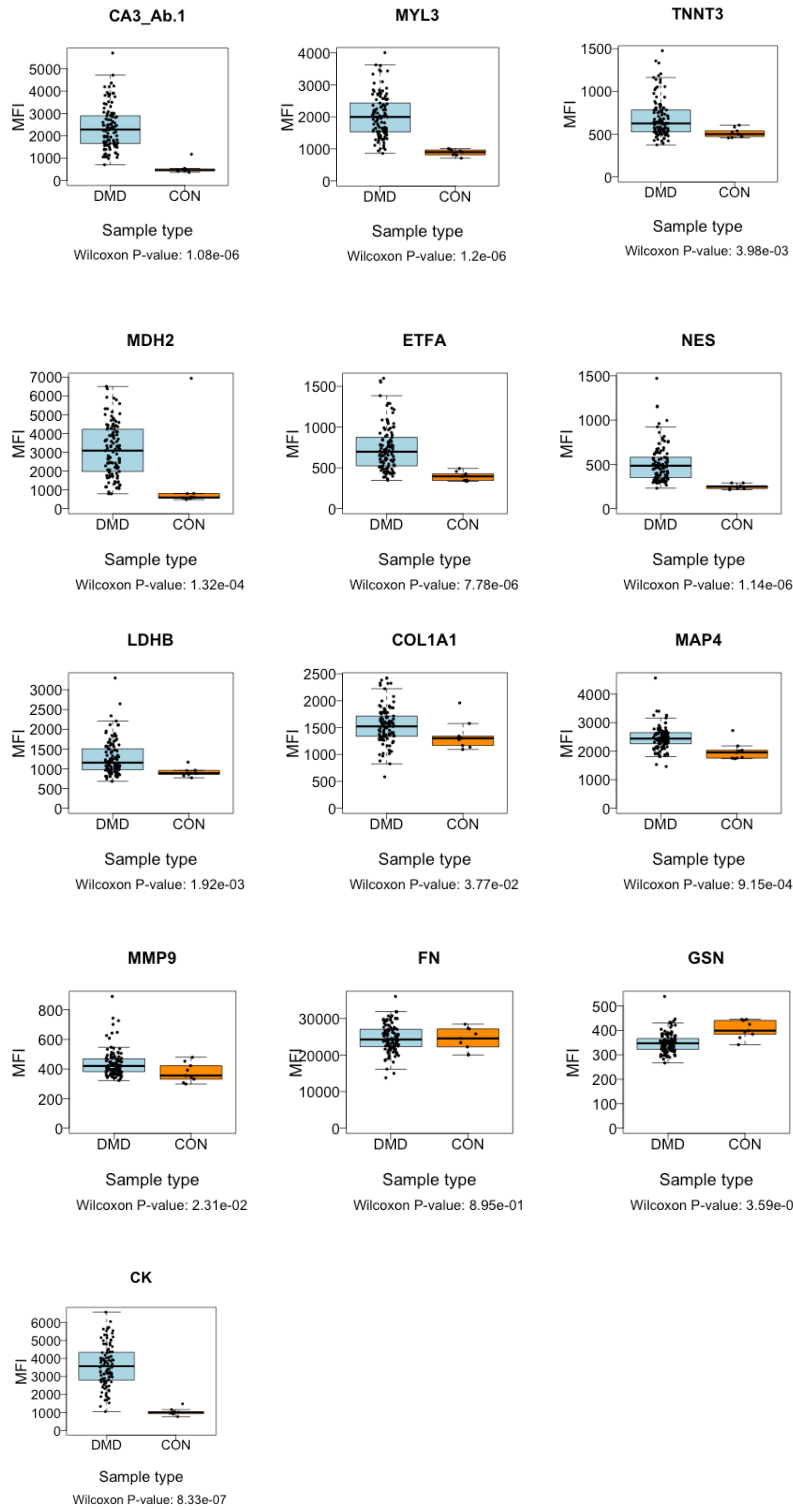


b) UCL serum

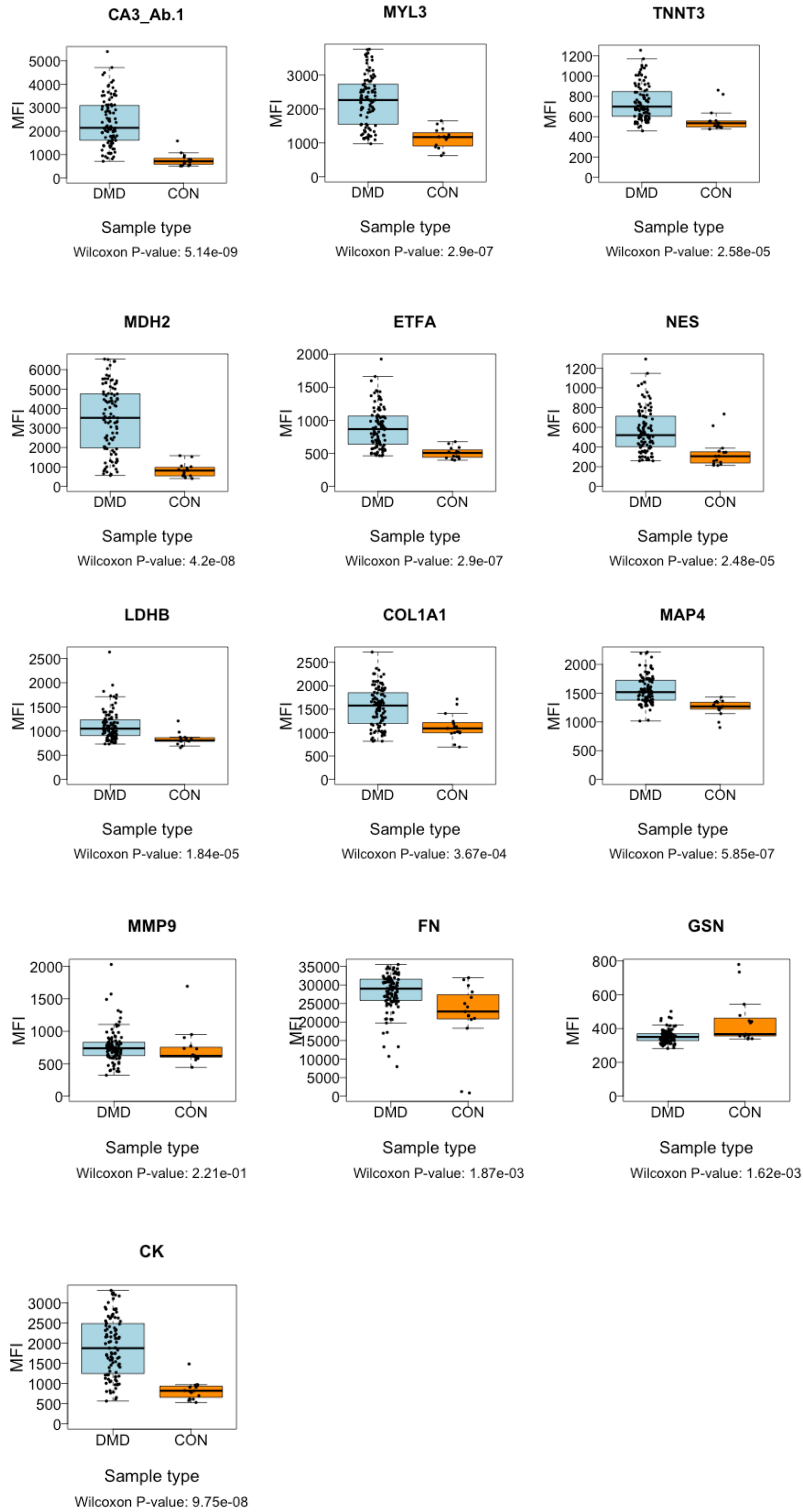




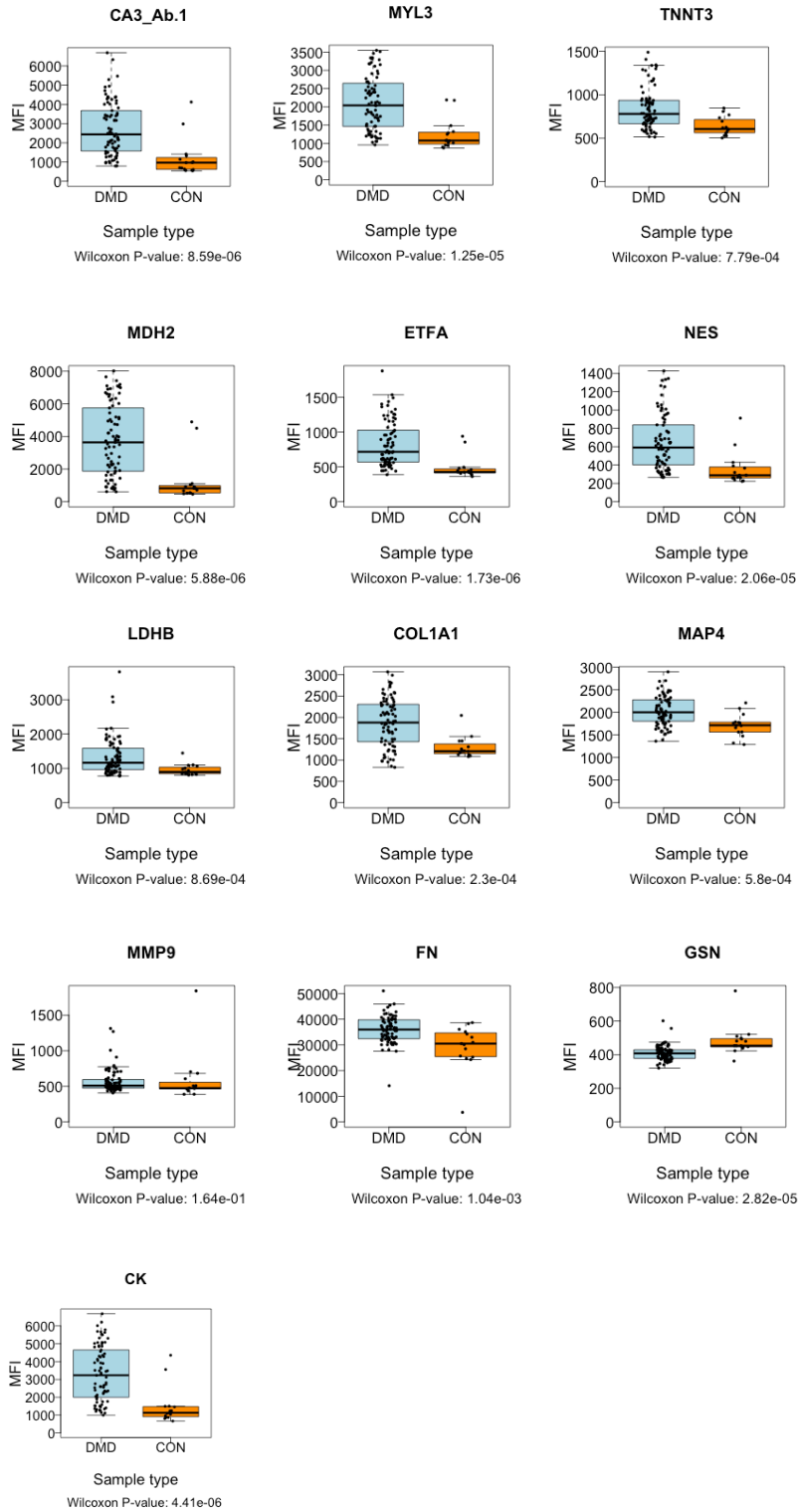
c) UCL plasma



d) UNEW serum



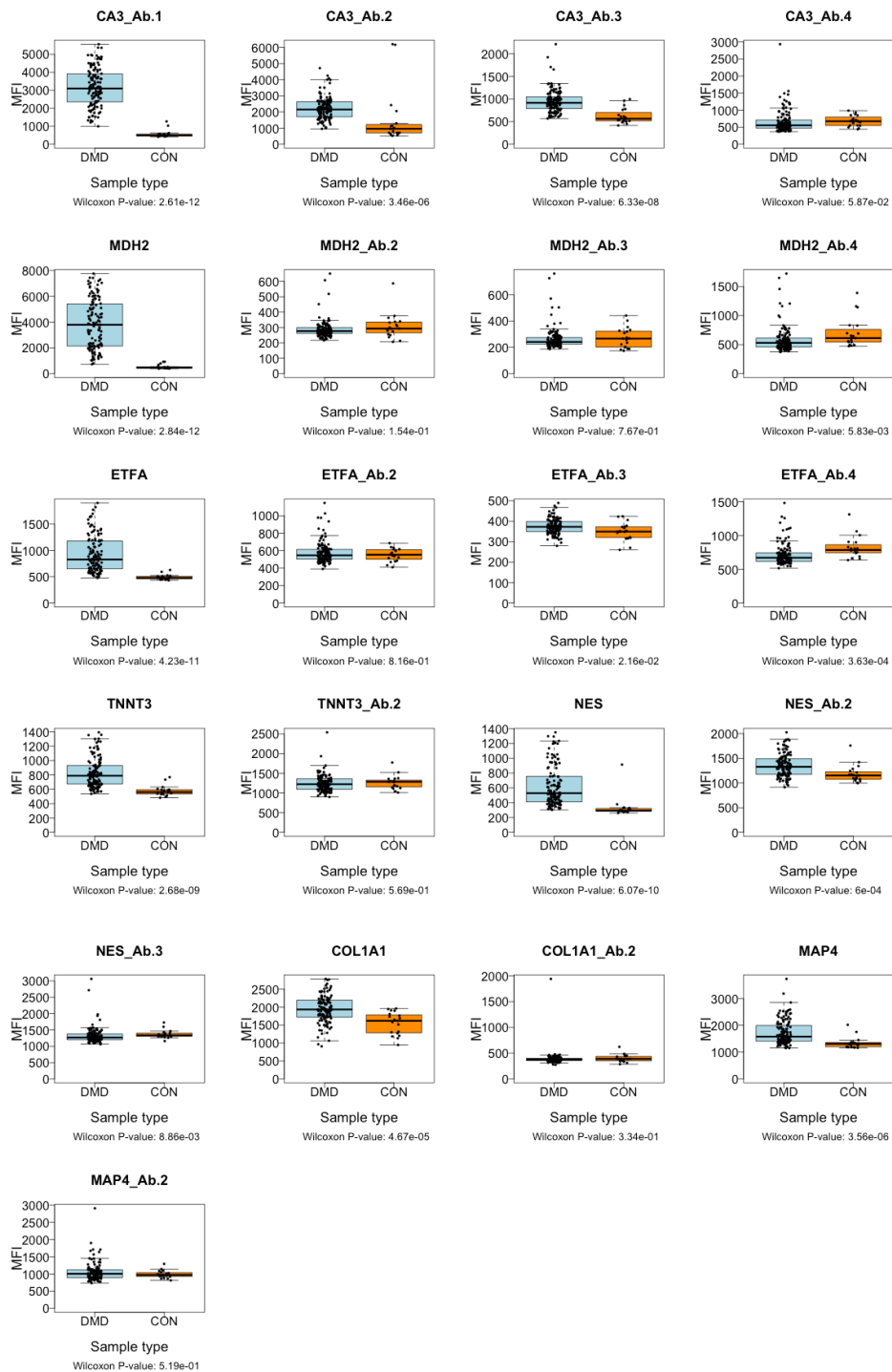
e) UNEW plasma



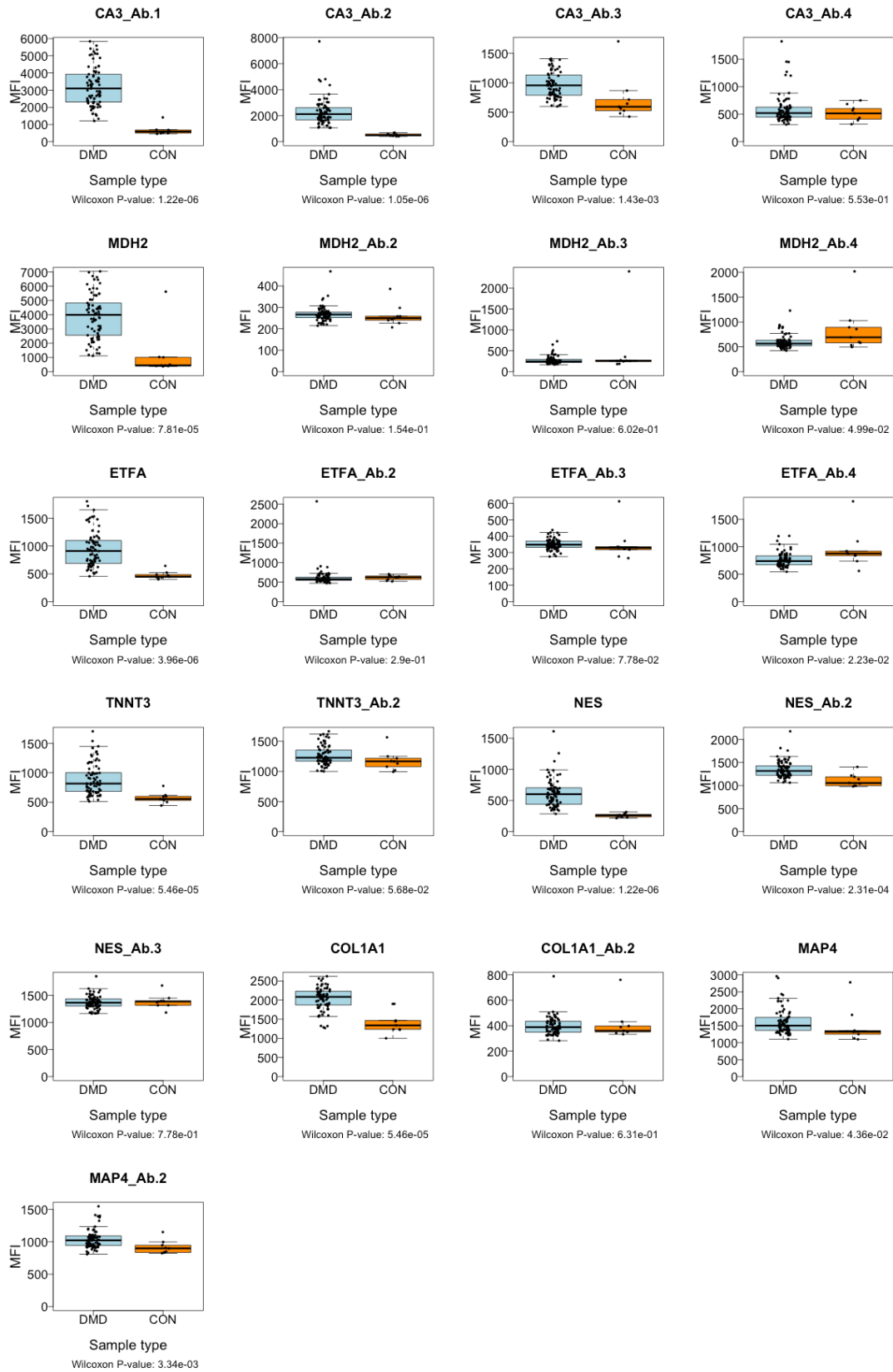
Supplementary figure 2:

Boxplots of patients (DMD) and controls (CON) in a) LUMC serum, b) UCL serum, c) UCL plasma, d) UNEW serum and e) UNEW plasma, for the proteins CA3, MDH2, ETFA, TNNT3, NES, COL1A1 and MAP, and the sibling-antibodies targeting these biomarkers. The blue boxes represent patient samples and the orange boxes represent control samples.

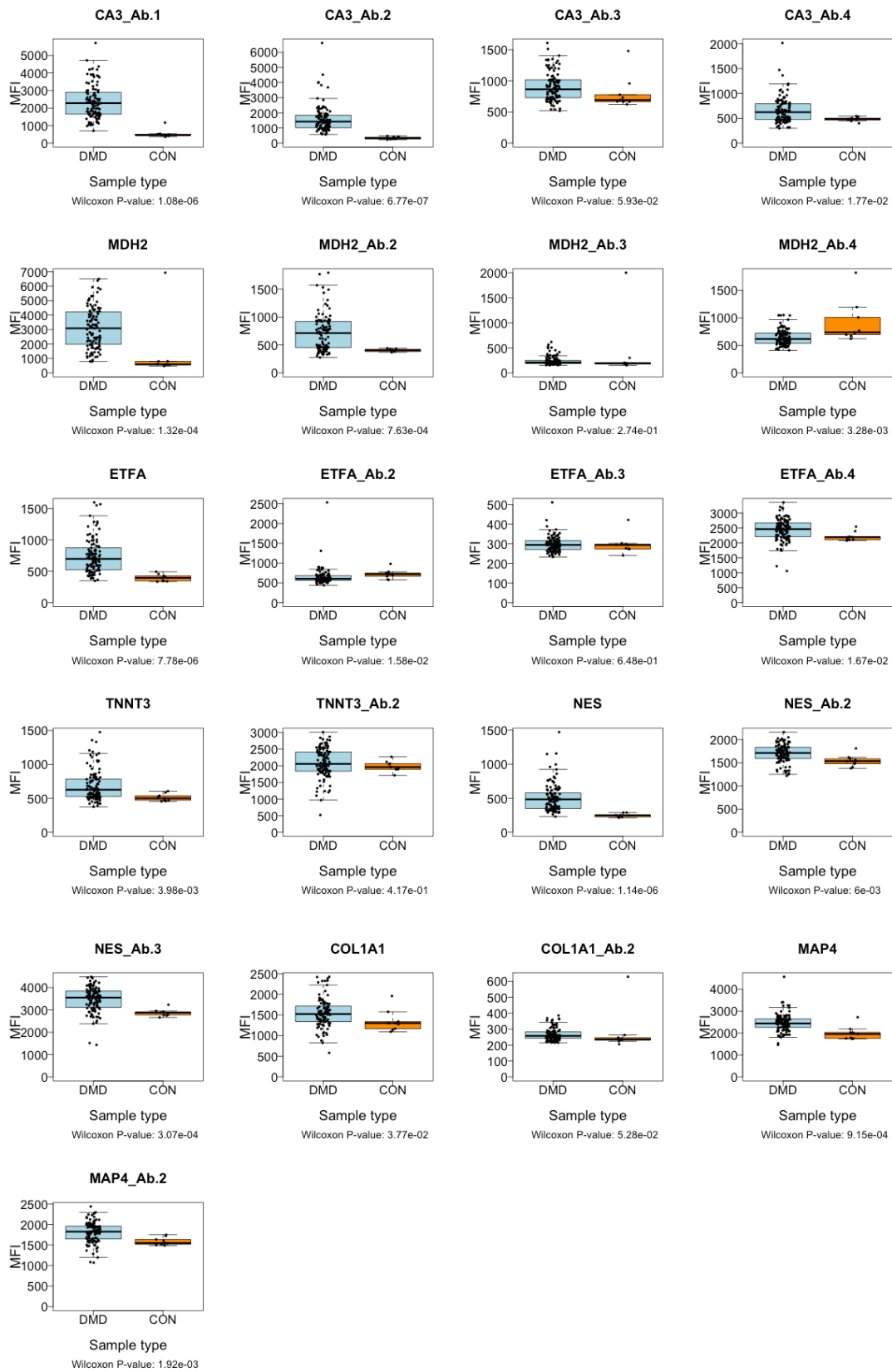
a) LUMC serum



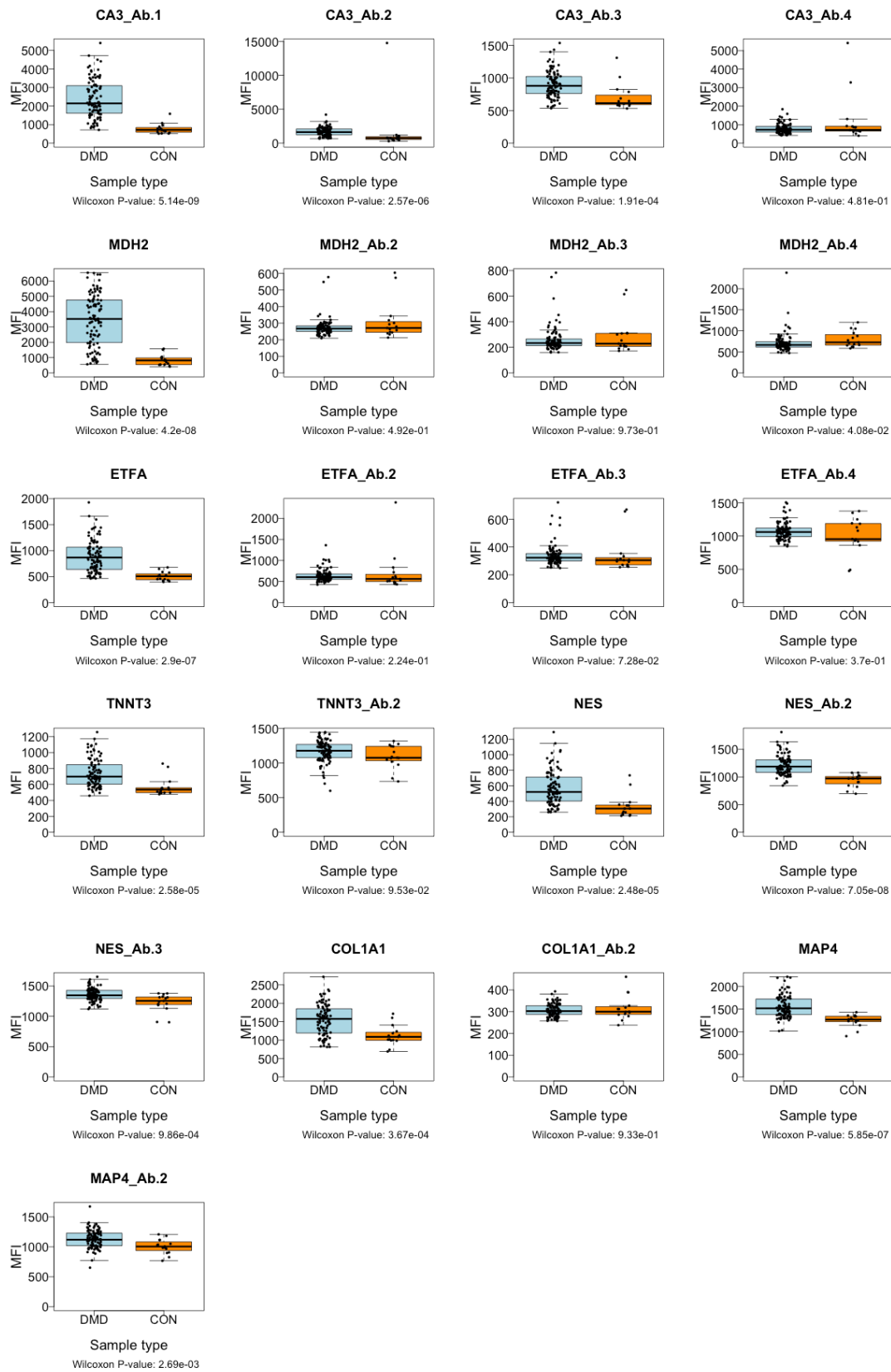
b) UCL serum



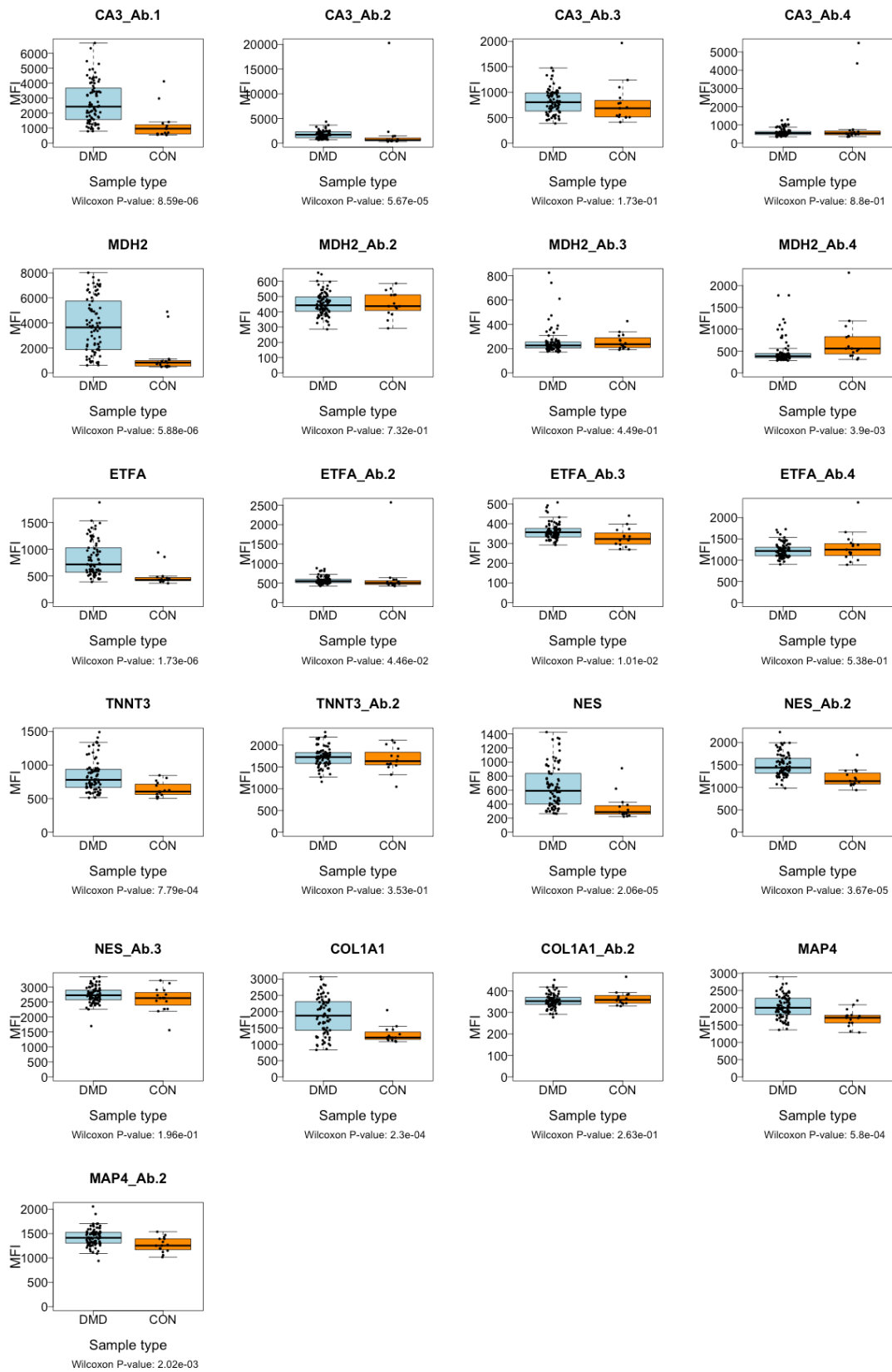
c) UCL plasma



d) UNEW serum

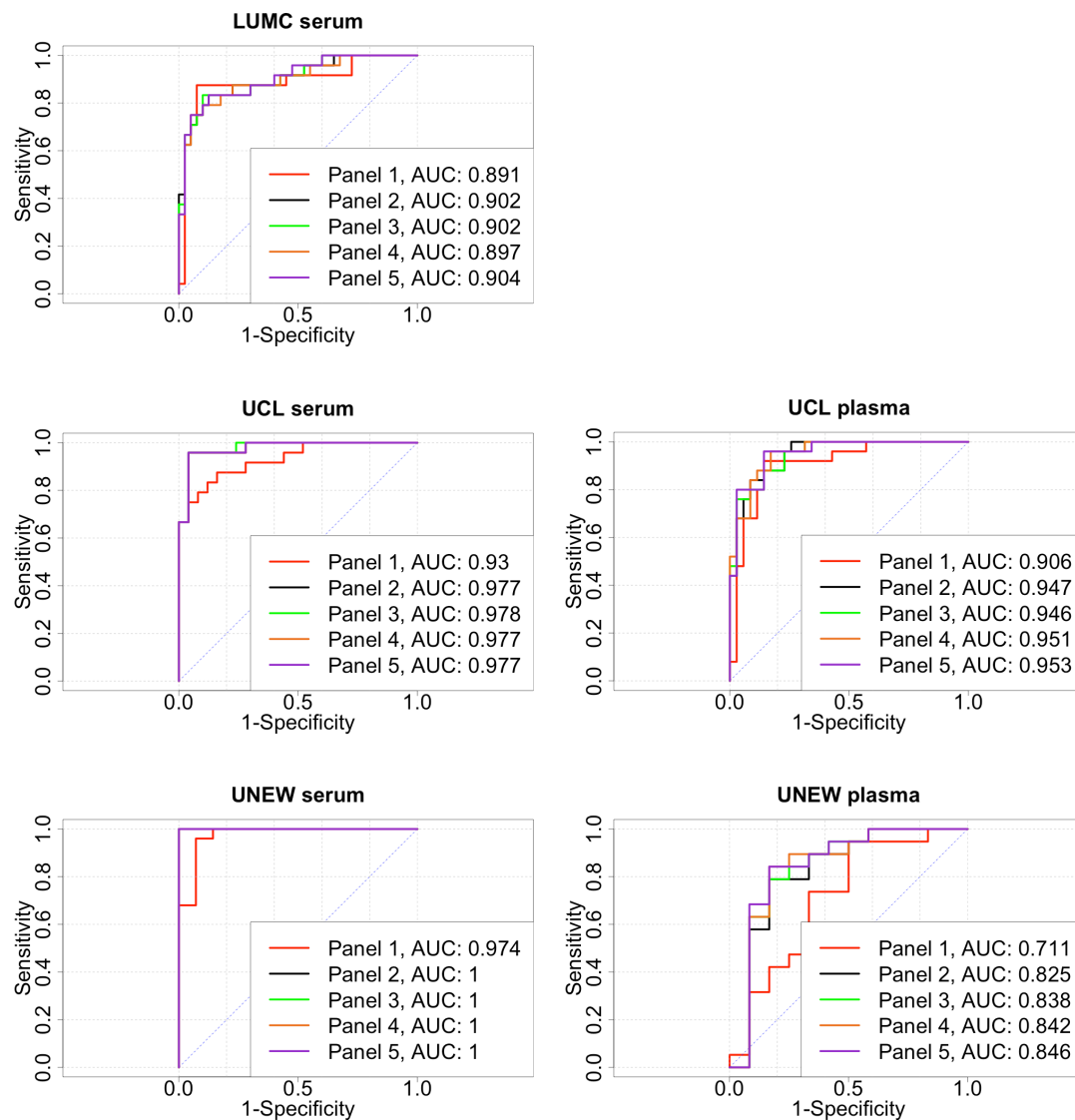


e) UNEW plasma



Supplementary figure 3:

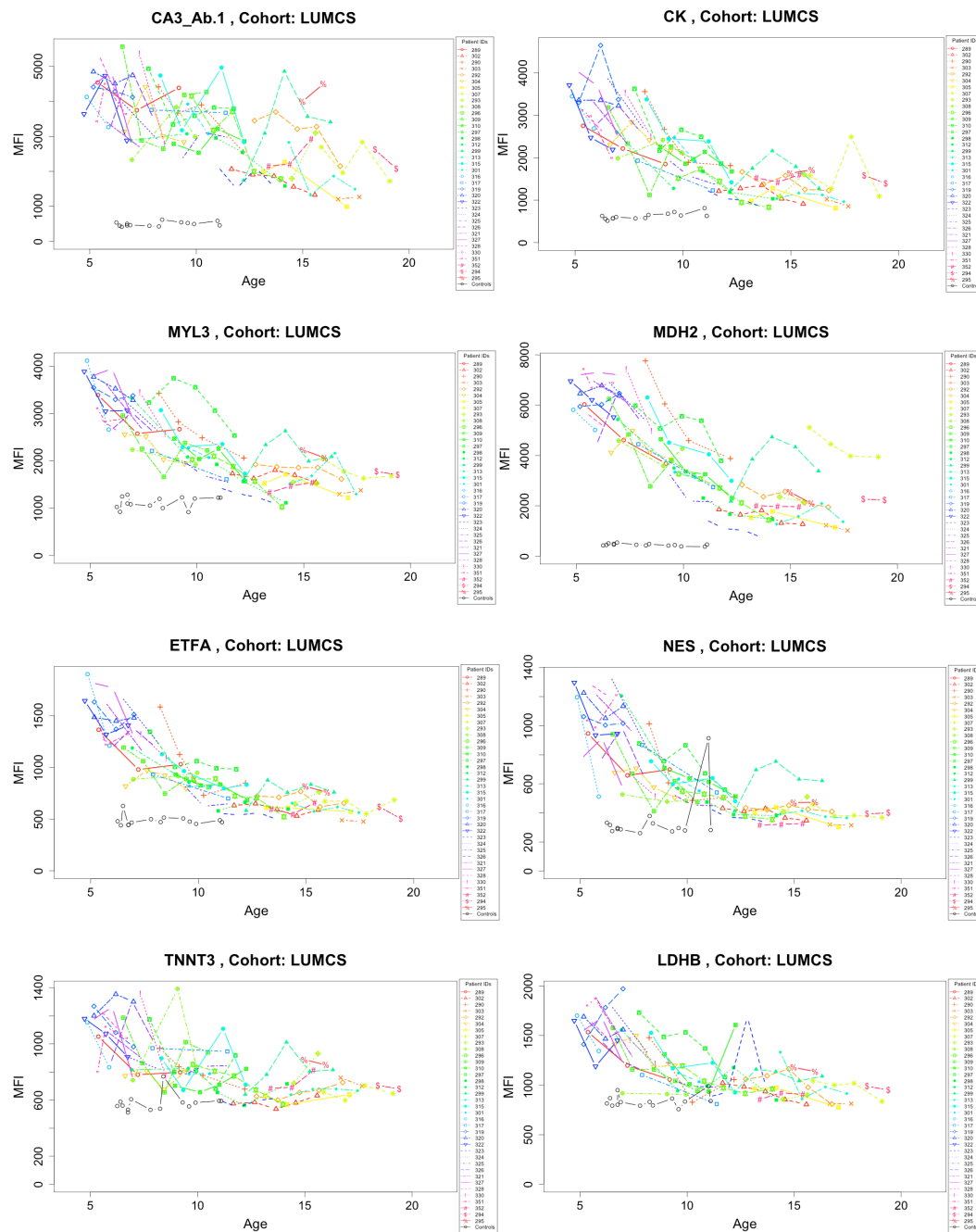
ROC curves for comparing the classification power of Panel 1 (CA3, MDH2, MYL3, TNNT3 and ETFA), Panel 2 (CA3, MDH2, MYL3, TNNT3, ETFA, NES and LDHB), Panel 3 (CA3, MDH2, MYL3, TNNT3, ETFA, NES, LDHB and MAP4), Panel 4 (CA3, MDH2, MYL3, TNNT3, ETFA, NES, LDHB and COL1A1) and Panel 5 (CA3, MDH2, MYL3, TNNT3, ETFA, NES, LDHB, COL1A1 and MAP4) for classification of age-matched ambulant and non-ambulant patients.

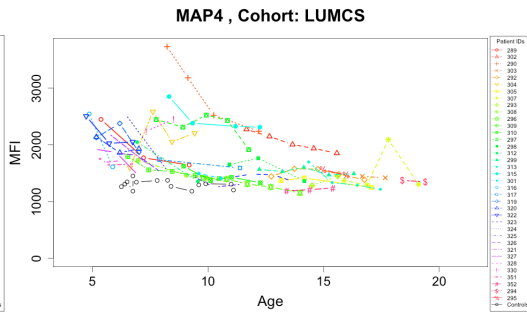
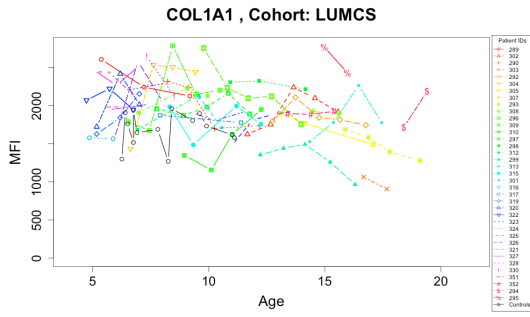


Supplementary figure 4:

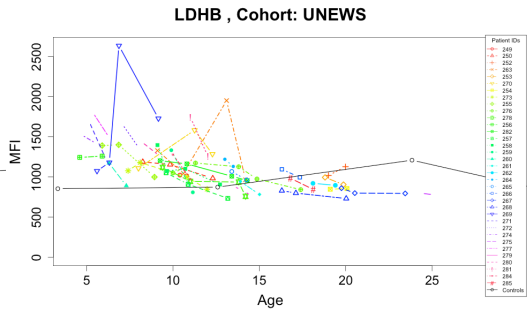
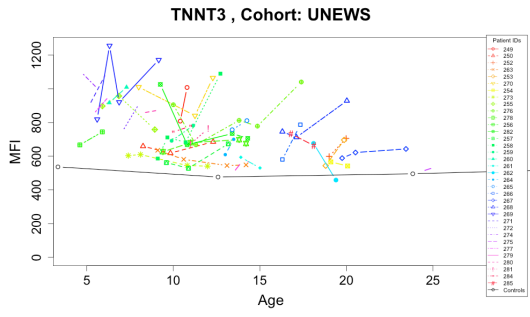
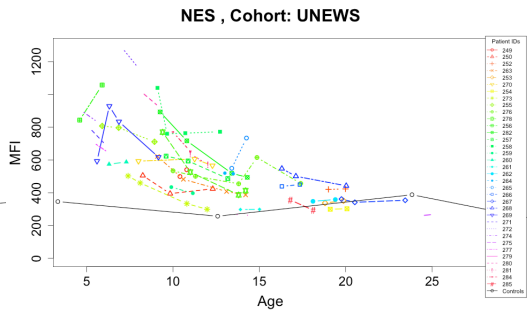
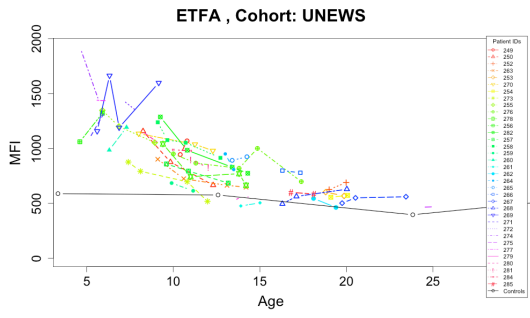
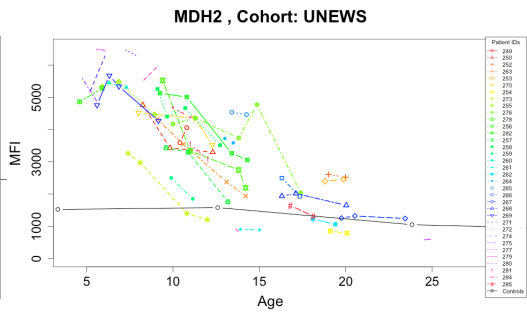
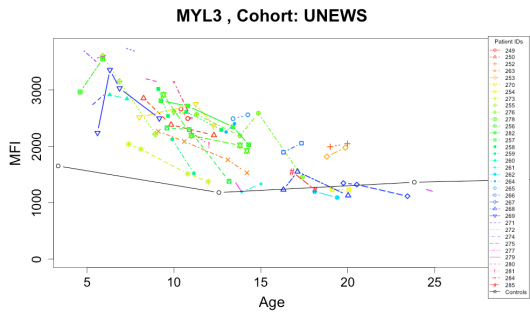
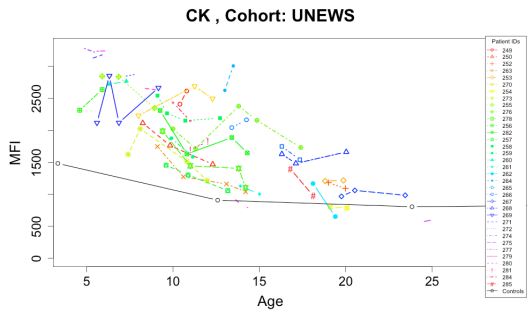
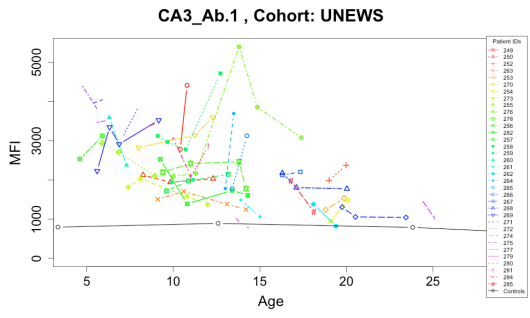
Longitudinal plots for all patients with two or more samples in a) LUMC serum cohort and b) UNEW serum cohort. The patient ID is stated in the legend to the right of each plot and the black data points are the control samples within the age-span 0-25.

a) LUMC serum

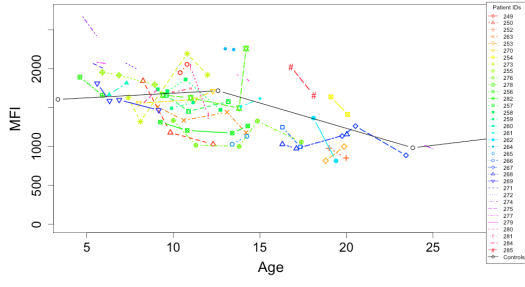




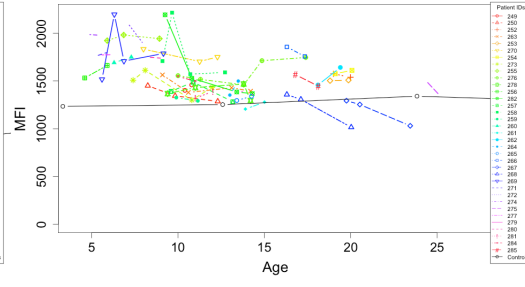
b) UNEW serum



COL1A1 , Cohort: UNEWS



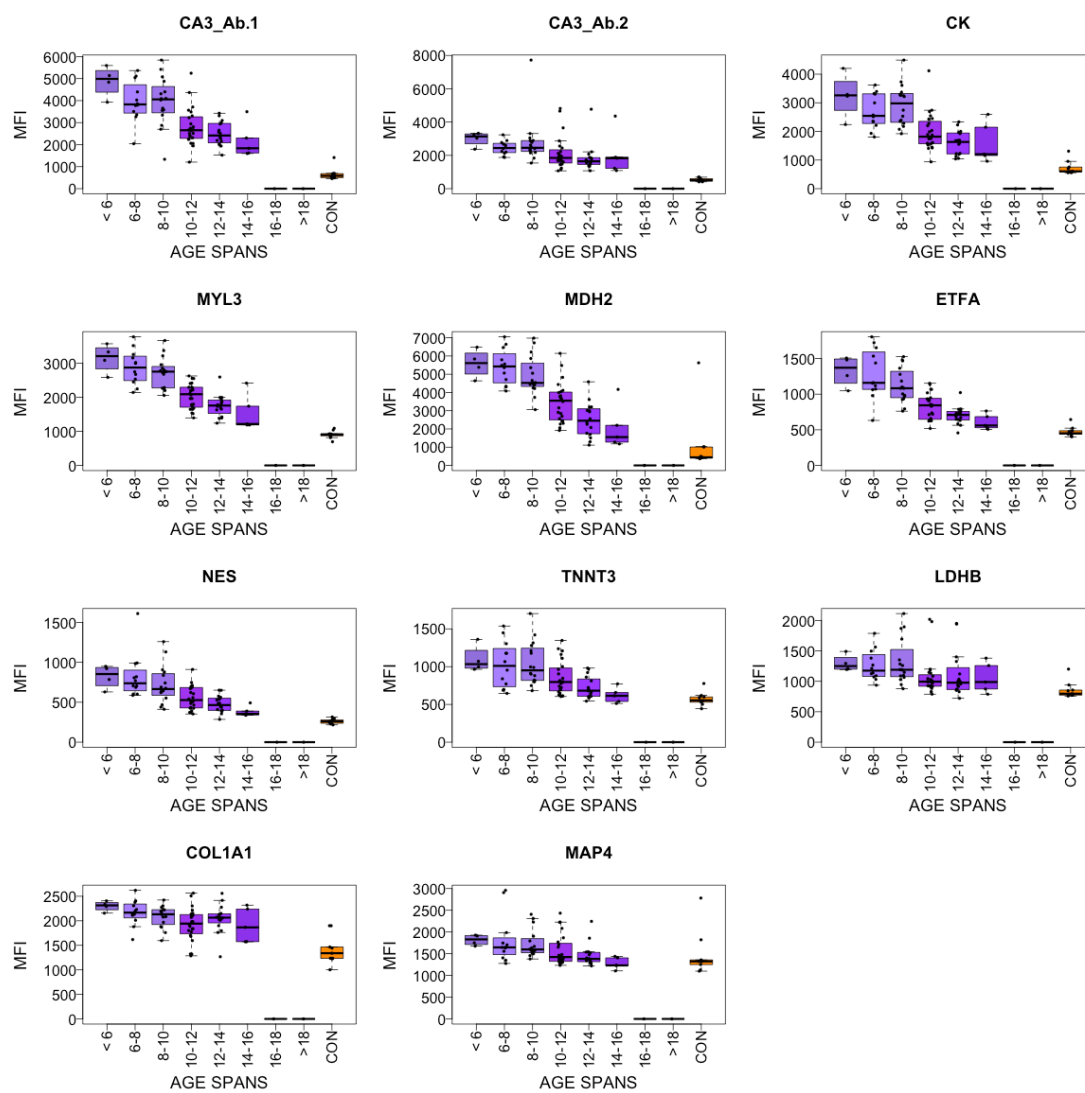
MAP4 , Cohort: UNEWS



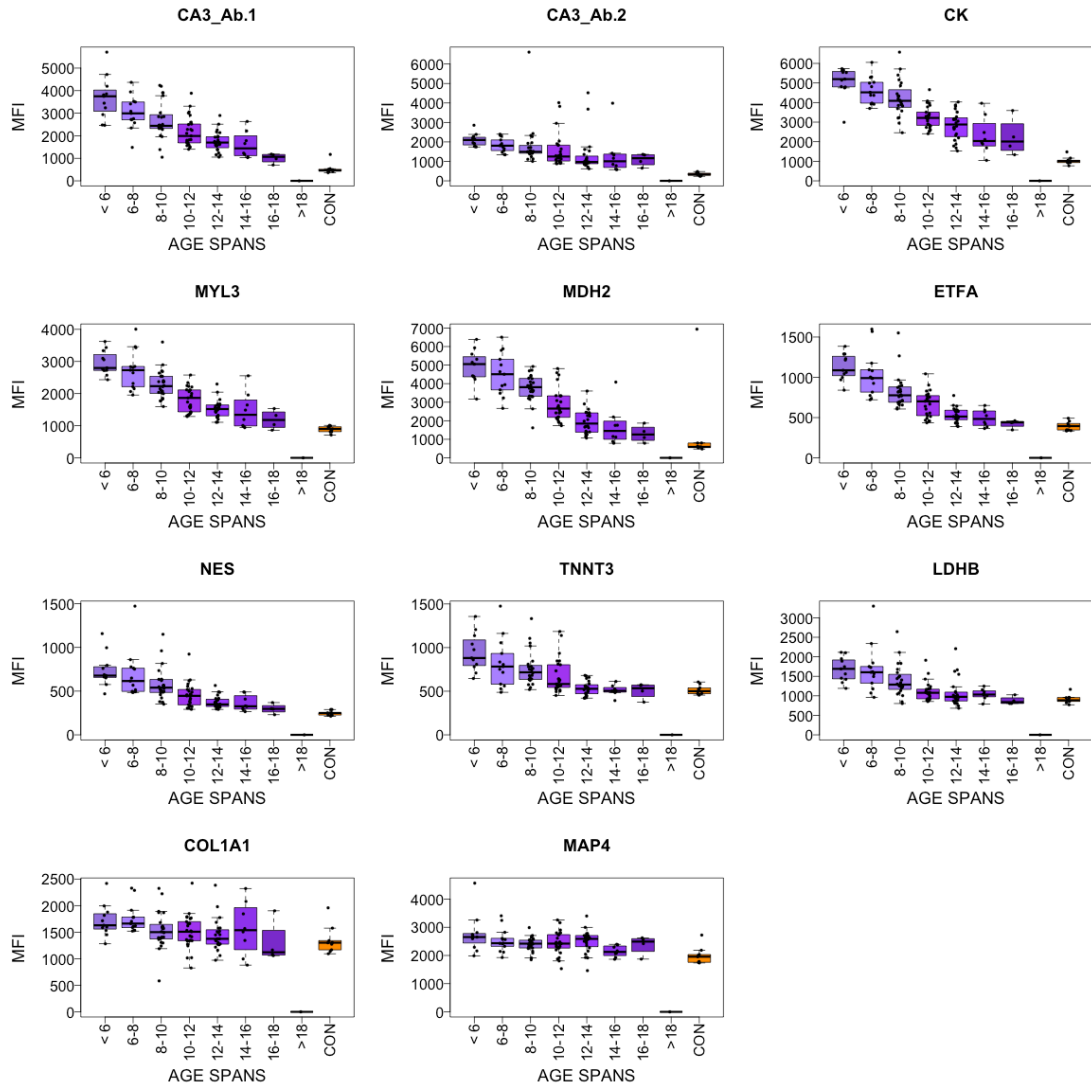
Supplementary figure 5:

Boxplots for the protein profile for eight different age subgroups (<6 years, 6-8 years, 8-10 years, 10-12 year, 12-14 years, 14-16 years and >16 years), in a) UCL serum, b) UCL plasma, c) UNEW serum and d) UNEW plasma. The purple boxes represent patient samples divided into subgroups, the orange boxes represent control samples. UCL serum does not have any patient samples in 16-18 and >18 years subgroups. UCL plasma does not have any patient samples in > 18 years subgroup.

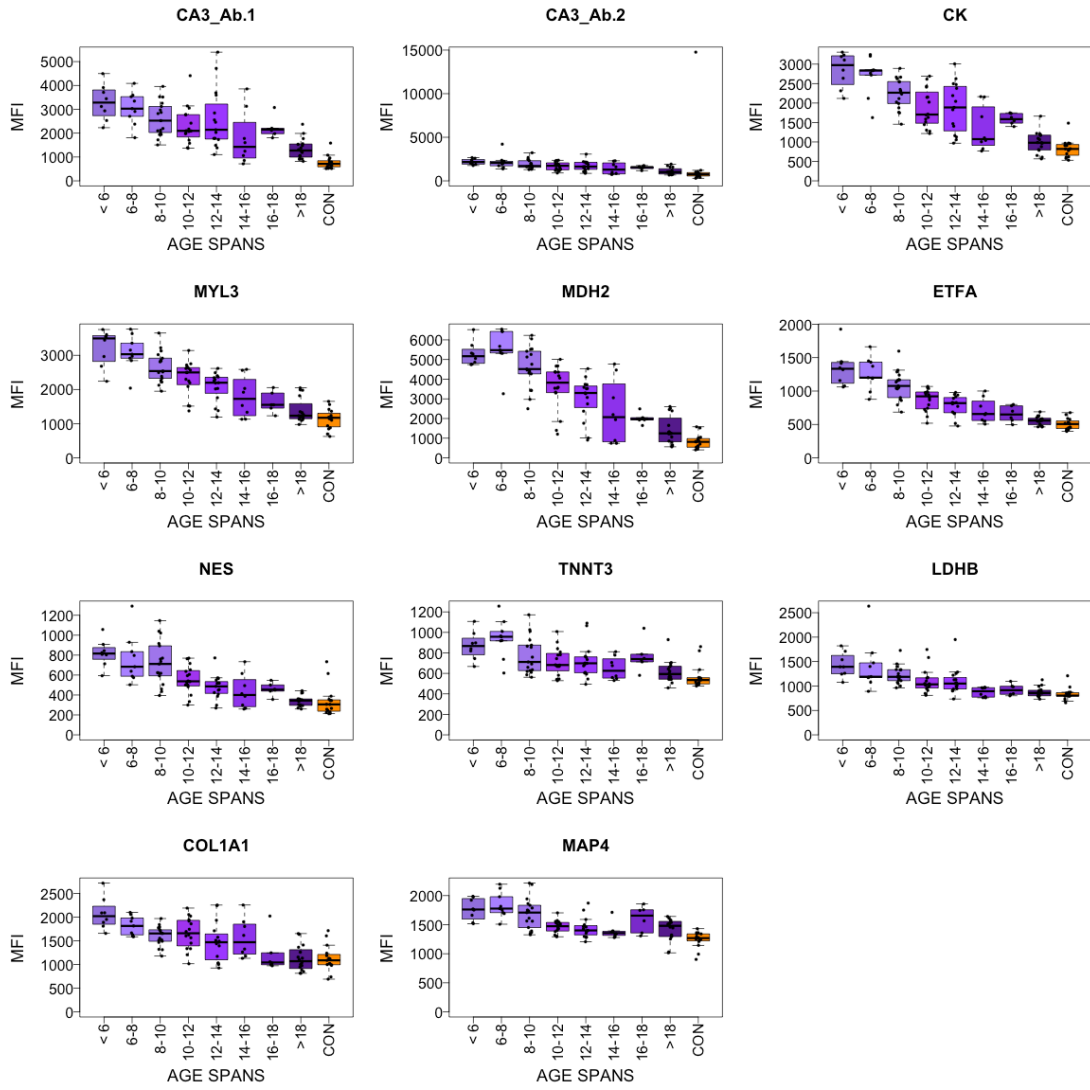
a) UCL serum



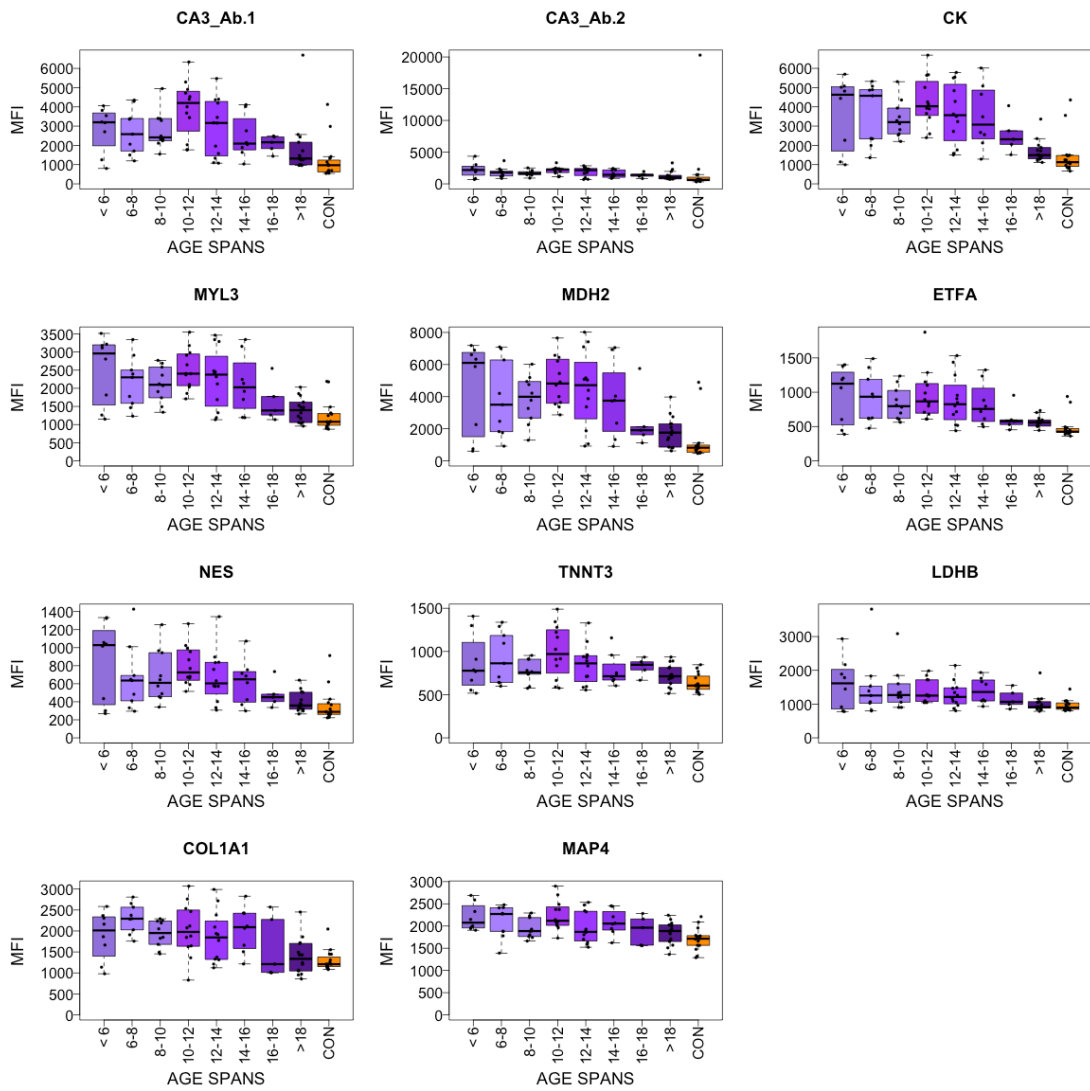
b) UCL plasma



c) UNEW serum



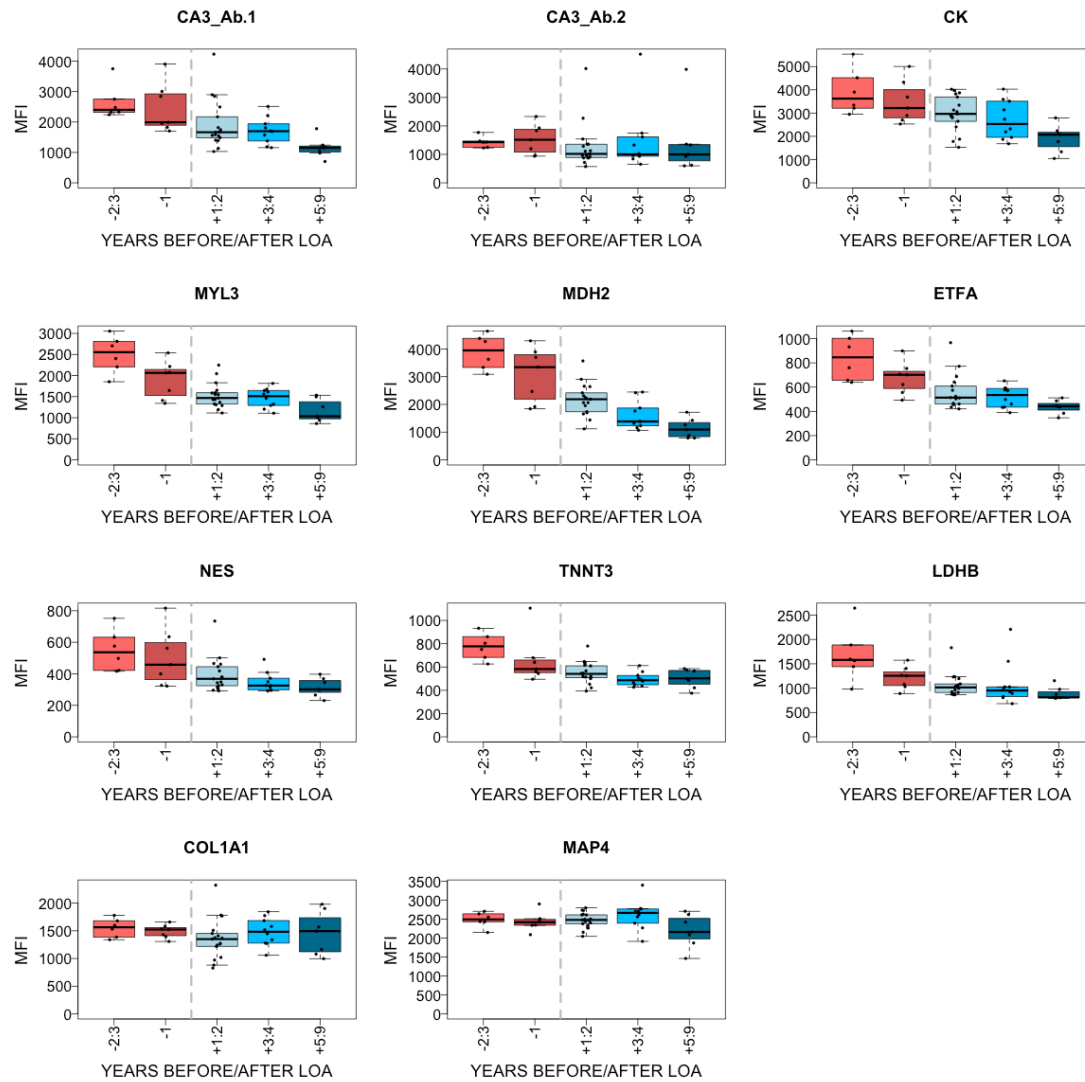
d) UNEW plasma



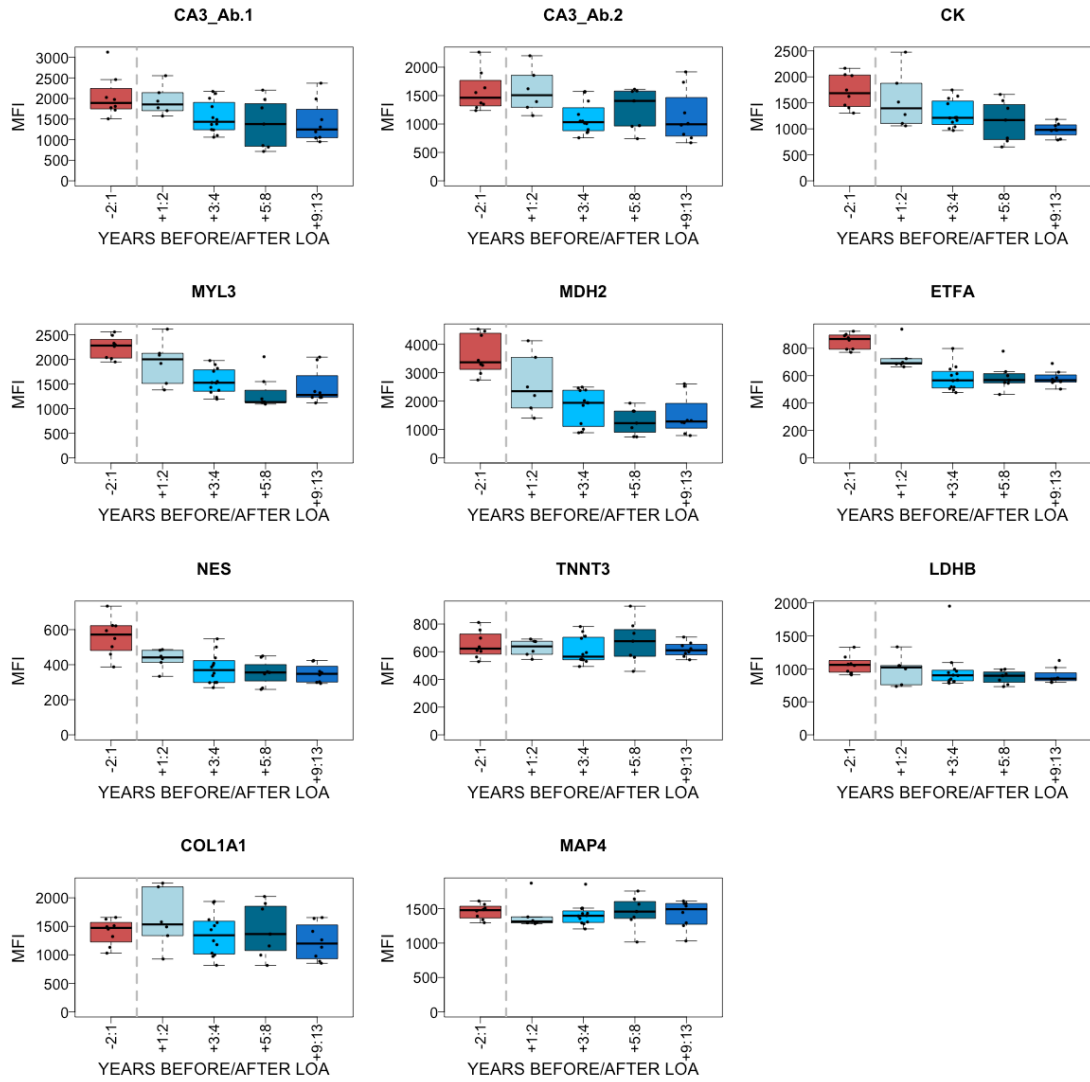
Supplementary figure 6:

Boxplots, from the LoA analysis, for the samples taken before and after the LoA of respective patient, in a) UCL plasma, b) UNEW serum and c) UNEW plasma. The red boxes represent samples taken before LoA, the blue boxes represent the samples taken after LoA and the grey dotted line represent the age of LoA.

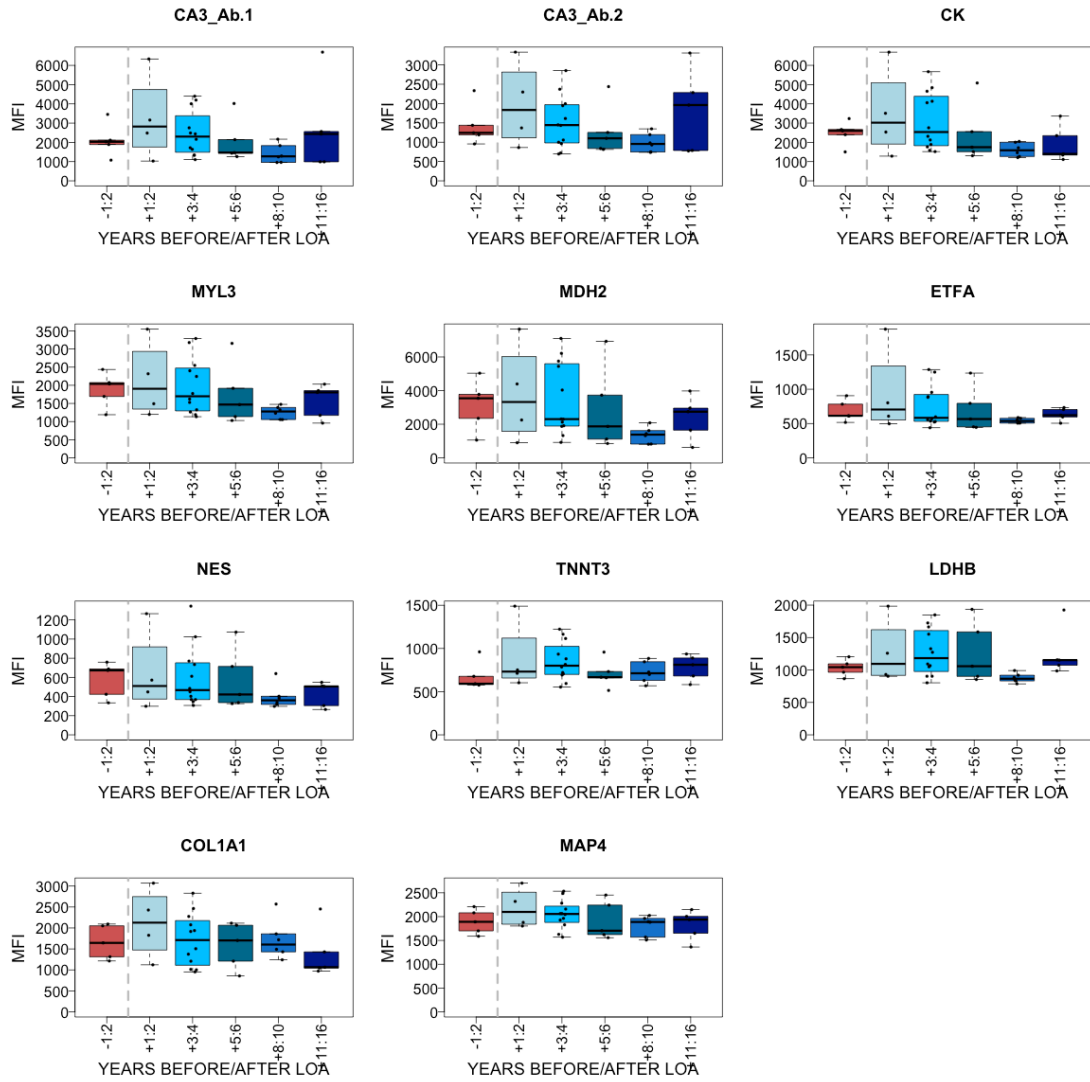
a) UCL plasma



b) UNEW serum



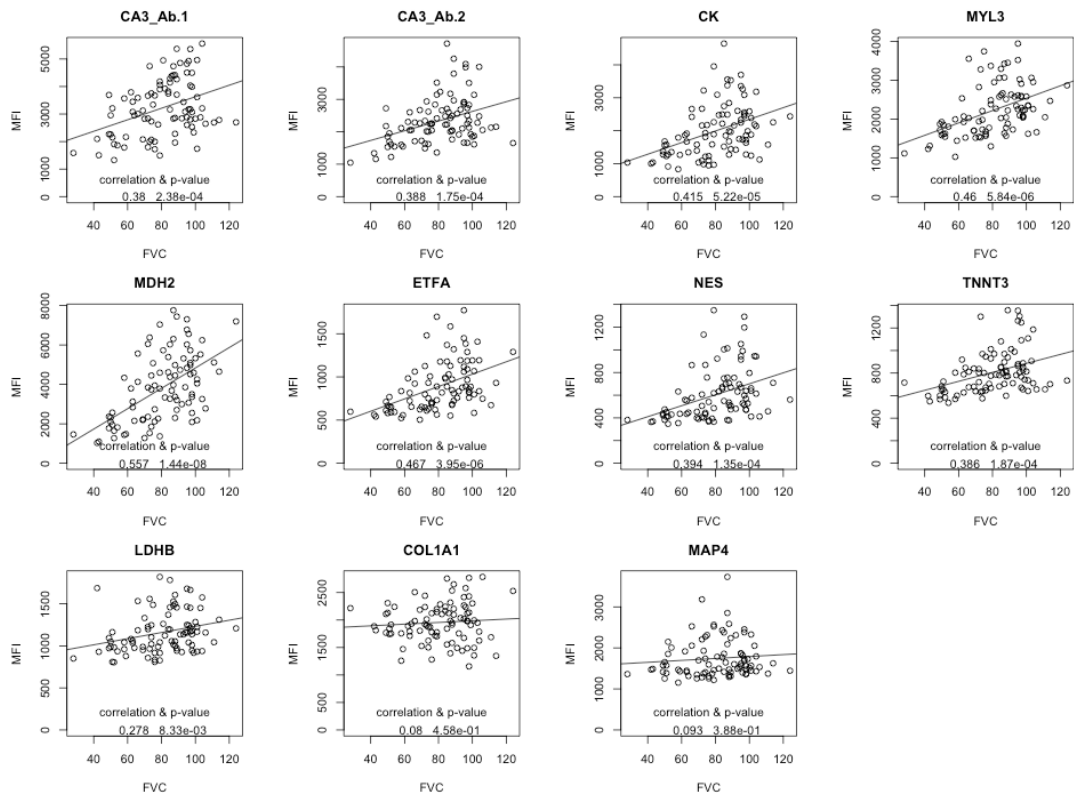
c) UNEW plasma



Supplementary figure 7:

Correlation plots of protein abundance profiles with FVC in (A) serum from LUMC recruited patients and (B) plasma samples from UNEW. Pearson correlation coefficient and its significance is displayed in respective plot and based on the analysis of 89 samples from LUMC and 64 samples from UNEW.

a) LUMC serum



b) UNEW plasma

