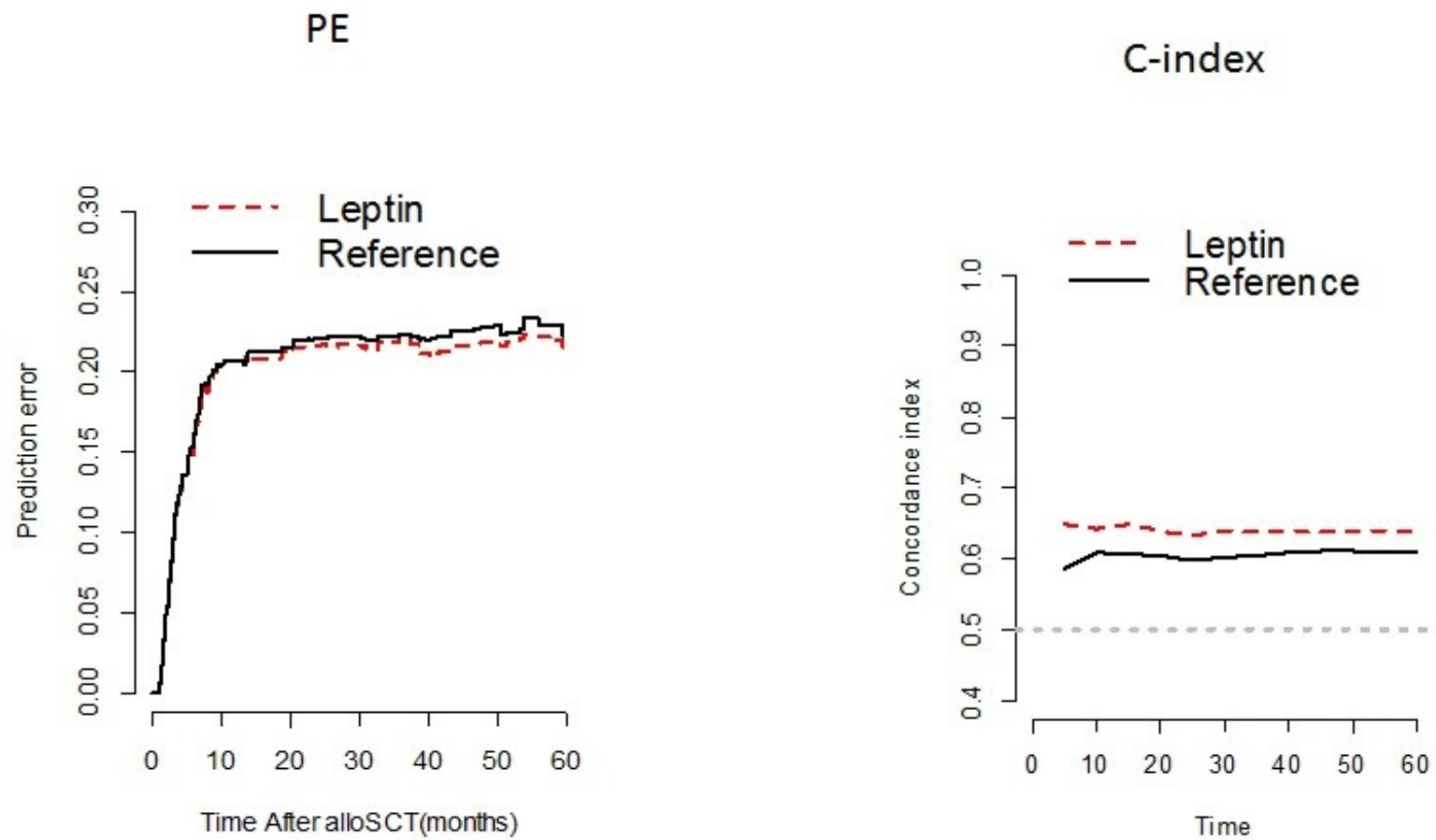**Supplementary Figure S1**. *Prediction error analysis and C-index of time to relapse (TTR) prediction in the multivariate model of Heidelberg intermediate/advanced stage Acute Leukaemia patients with and without (reference) consideration of Leptin*

Supplementary Figure S2. *Prediction error analysis and C-index of time to relapse (TTR) prediction in multivariate model of Essen intermediate/advanced stage AML patients with and without (reference) consideration of Leptin.*

Supplementary Table S1. Multivariate Cox regression analysis with endpoint time to relapse (TTR) in the full Heidelberg cohort.

	HR (95% CI)	P	SIG
Pre-conditioning Leptin (per log2)	0.91 (0.82 -1.00)	0.061	.
Age at transplant (per 10 years)	0.94 (0.83 -1.06)	0.326	
Disease stage[+]			
CR1	Ref	Ref	***
>CR1	3.09 (2.11- 4.53)	<0.001	
Disease entity			
AML/ALL	Ref	Ref	***
Other	0.57 (0.41 -0.79)	<0.001	
HLA match			
match (10/10)	Ref	Ref	
mismatch	0.76 (0.51- 1.12)	0.161	
Conditioning			
MAC	Ref	Ref	
RIC	1.22 (0.79- 1.98)	0.367	
ATG			
Not given	Ref	Ref	
given	0.92 (0.66 – 1.27)	0.608	
Recipient sex			
Female	Ref	Ref	
Male	0.88 (0.64- 1.20)	0.416	
Donor sex			
Female	Ref	Ref	
Male	0.90 (0.65- 1.24)	0.512	

*Significance code: '***' p< 0.001; '**' p<0.01; '*' p<0.05; '.' p<0.1; [+] According to Gratwohl et al., 2009   [51]. Abbreviations: SIG-significance; HR-hazard ratio; HLA-human leukocyte antigen; RIC-reduced intensity conditioning; MAC-Myeloablative conditioning; ATG-anti-thymocyte globulin; CR – complete remission before alloSCT.*

Supplementary Table S2. Multivariate Cox regression analysis with endpoint to time to relapse (TTR) in the full Heidelberg cohort including interaction term of disease entity and Leptin serum level.

	HR (95% CI)	P	SIG
Age at transplant (per 10 years)	0.94 (0.83 -1.07)	0.344	
Disease stage[+]			
CR1	Ref	Ref	***
>CR1	2.99 (2.04- 4.37)	<0.001	
HLA match			
match (10/10)	Ref	Ref	
mismatch	0.78 (0.53- 1.15)	0.212	
Conditioning			
MAC	Ref	Ref	
RIC	1.20 (0.78- 1.87)	0.406	
ATG			
Not given	Ref	Ref	
given	0.92 (0.66 – 1.27)	0.519	
Recipient sex			
Female	Ref	Ref	
Male	0.87 (0.64 – 1.19)	0.416	
Donor sex			
Female	Ref	Ref	
Male	0.90 (0.65- 1.24)	0.500	
Leptin (log2) * disease entity (AML and ALL)	0.83 (0.71 -0.99)	0.033	*
Leptin (log2) * disease entity (other)	0.95 (0.84 – 1.09)	0.480	

*Significance code: '***' p< 0.001; '**' p<0.01; '*' p<0.05; '.' p<0.1; * According to Gratwohl et al., 2009 (21). Abbreviations: SIG-significance; HR-hazard ratio; HLA-human leukocyte antigen; RIC-reduced intensity conditioning; MAC-Myeloablative conditioning; ATG-anti-thymocyte globulin. CR – complete remission before alloSCT, AML, acute myeloid leukemia, ALL, acute lymphoid leukemia.*

Supplementary Table S3. Multivariate Cox regression analysis with endpoint time to relapse (TTR) in Acute Leukemia patients, Heidelberg cohort.

	HR (95% CI)	P	SIG
Age at transplant (per 10 years)	1.02 (0.85 -1.11)	0.825	
HLA match			
match (10/10)	Ref	Ref	
mismatch	0.70 (0.39- 1.28)	0.251	
Conditioning			
MAC	Ref	Ref	
RIC	0.85 (0.50- 1.43)	0.530	
ATG			
Not given	Ref	Ref	
given	1.28 (0.74 – 2.21)	0.378	
Recipient sex			
Female	Ref	Ref	
Male	0.91 (0.55 – 1.52)	0.726	
Donor sex			
Female	Ref	Ref	*
Male	0.55 (0.32- 0.93)	0.027	
Leptin (log2) x disease stage[+] (early)	0.85 (0.65 -1.12)	0.256	
Leptin (log2) x disease stage[+] (intermediated/advanced)	0.79 (0.63 – 0.99)	0.040	*

*Significance code: '***' p< 0.001; '**' p<0.01; '*' p<0.05; '.' p<0.1; [+] According to Gratwohl et al., 2009 (21). Abbreviations: SIG-significance; HR-hazard ratio; HLA-human leukocyte antigen; RIC-reduced intensity conditioning; MAC-Myeloablative conditioning; ATG-anti-thymocyte globulin.*

Supplementary Table S4. Multivariate Cox regression analysis with endpoint time to relapse (TTR) in Acute Leukemia patients, Essen cohort, considering interaction of disease stage and Leptin serum level.

	HR (95% CI)	p	SIG
Age at transplant (per 10 years)	1.00 (0.85 -1.18)	0.995	
HLA match			
match (10/10)	Ref	Ref	
mismatch	1.34 (0.73-2.63)	0.163	
Conditioning			
MAC	Ref	Ref	
RIC	1.38 (0.73- 2.63)	0.320	
ATG			
Not given	Ref	Ref	
given	0.85 (0.57 – 1.28)	0.441	
Donor sex			
Female	Ref	Ref	
Male	0.79 (0.53- 1.18)	0.252	
Recipient sex			
Female	Ref		
Male	1.01 (0.67-1.52)	0.973	
Leptin (log2) x disease stage[+] (early)	1.02 (0.86 -1.21)	0.813	
Leptin (log2) x disease stage[+] (intermediate/advanced)	0.83 (0.72 – 0.96)	0.013	*

*Significance code: '***' p< 0.001; '**' p<0.01; '*' p<0.05; '.' p<0.1; [+] According to Gratwohl et al., 2009 (34). Abbreviations: SIG-significance; HR-hazard ratio; HLA-human leukocyte antigen; RIC-reduced intensity conditioning; MAC-Myeloablative conditioning; ATG-anti-thymocyte globulin.*

Supplementary Table S5. Multivariate Cox regression analysis **including Adiponectin** (n=85), with endpoint time to relapse (TTR) in intermediate/advanced Acute leukaemia (>CR1)[#], training cohort

	HR (95% CI)	P	SIG
Pre-conditioning Adiponectin (per log2)	0.84 (0.60-1.19)	0.331	
Pre-conditioning Leptin (per log2)	0.73 (0.57-0.95)	0.018	*
Age at transplant (per 10 years)	1.02 (0.99-1.06)	0.136	
HLA match			
match (10/10)	Ref		
mismatch	1.05 (0.71-1.57)	0.794	
Conditioning			
MAC	Ref		
RIC	1.33 (0.66-2.69)	0.427	
ATG			
Not given	Ref		
given	0.62(0.27-1.44)	0.269	
Donor sex			
Female	Ref		
Male	0.57 (0.27-1.44)	0.164	
Recipient sex			
Female	Ref		
Male	0.51 (0.25-1.05)	0.069	

*Significance code: '***' p< 0.001; '**' p<0.01; '*' p<0.05; '.' p<0.1, [#] According to Gratwohl et al., 2009 (34). Abbreviations: SIG-significance; HR-hazard ratio; HLA-human leukocyte antigen; RIC-reduced intensity conditioning; MAC-Myeloablative conditioning; ATG-anti-thymocyte globulin.*

Supplementary Table S6. Multivariate Cox regression analysis **including BMI** (n=81), with endpoint time to relapse (TTR) in intermediate/advanced Acute leukaemia (>CR1)[#], training cohort

	HR (95% CI)	p	SIG
BMI <22 kg/m^2	Ref		
BMI 22-29.9 kg/m^2	0.62 (0.13-3.22)	0.591	
BMI≥30 kg/m^2	1.48 (0.55-3.97)	0.432	
Pre-conditioning Leptin (per log2)	0.70 (0.51-0.98)	0.038	*
Age at transplant (per 10 years)	1.01 (0.98-1.05)	0.553	
HLA match			
match (10/10)	Ref		
mismatch	1.24 (0.83-1.84)	0.286	
Conditioning			
MAC	Ref		
RIC	1.46 (0.45-4.68)	0.527	
ATG			
Not given	Ref		
given	0.31 (0.12-0.83)	0.019	*
Donor sex			
Female	Ref		
Male	0.30 (0.11-0.80)	0.017	*
Recipient sex			
Female	Ref		
Male	0.58 (0.24-1.42)	0.236	

*Significance code: '***' p< 0.001; '**' p<0.01; '*' p<0.05; '.' p<0.1, [#] According to Gratwohl et al., 2009 (34). Abbreviations: SIG-significance; HR-hazard ratio; HLA-human leukocyte antigen; RIC-reduced intensity conditioning; MAC-Myeloablative conditioning; ATG-anti-thymocyte globulin.*

Supplementary Table S7. *Multivariate Cox regression analysis with endpoints acute GvHD and acute GvHD grade 3+4 in* Acute Leukemia patients *(Heidelberg cohort).*

	Acute GvHD		Acute GvHD grade 3+4	
	HR (95% CI)	**P**	**HR (95% CI)**	**P**
Pre-conditioning Leptin (per log2)	0.94 (0.72 -1.22)	0.630	0.88 (0.59 -1.33)	0.544
Age at transplant (per 10 years)	0.93 (0.74 -1.19)	0.579	1.22 (0.82 -1.83)	0.326
HLA match				
match (10/10)	Ref	Ref	Ref	Ref
mismatch	1.15 (0.55 -2.42)	0.706	2.29 (0.76 -6.89)	0.140
Conditioning				
MAC	Ref	Ref **	Ref	Ref *
RIC	0.35 (0.17 -0.70)	0.003	0.26 (0.09 -0.77)	0.015
ATG pre transplant				
Not given	Ref	Ref	Ref	Ref
Given	0.58 (0.26 -1.28)	0.177	0.43 (0.13 - 1.46)	0.176
Recipient sex				
Female	Ref	Ref	Ref	Ref
Male	0.58 (0.27 -1.24)	0.160	0.81 (0.26 - 2.52)	0.717
Donor sex				
Female	Ref	Ref	Ref	Ref
Male	1.52 (0.65 -3.52)	0.332	1.03 (0.33 - 3.26)	0.959

*Significance code: '***' p< 0.001; '**' p<0.01; '*' p<0.05; '.' p<0.1; [+] According to Gratwohl et al., 2009 (34). Abbreviations: SIG-significance; HR-hazard ratio; HLA-human leukocyte antigen; RIC-reduced intensity conditioning; MAC-Myeloablative conditioning; ATG-anti-thymocyte globulin.*

Supplementary Table S8. *Multivariate Cox regression analysis with endpoints acute GvHD and acute GvHD grade 3+4 in* Acute Leukemia patients *(Essen cohort).*

	Acute GvHD		Acute GvHD grade 3+4		
	HR (95% CI)	P	HR (95% CI)	P	
Pre-conditioning Leptin (per log2)	1.13 (0.99 -1.27)	0.052	1.00 (0.73 -1.37)	0.991	
Age at transplant (per 10 years)	1.00 (0.86 -1.16)	0.988	0.97 (0.69 -1.37)	0.881	
HLA match					
match (10/10)	Ref	Ref	Ref	Ref	
mismatch	1.14 (0.79 -1.65)	0.486	0.92 (0.36 -2.37)	0.861	
Conditioning					
MAC	Ref	Ref	Ref	Ref	
RIC	0.84 (0.47 -1.49)	0.544	4.18 (0.51 - 34.28)	0.183	
ATG pre transplant					
Not given	Ref	Ref	Ref	Ref	*
Given	0.91 (0.64 -1.29)	0.588	0.33 (0.13 - 0.97)	0.024	
Recipient sex					
Female	Ref	Ref	Ref	Ref	
Male	1.10 (0.74 -1.63)	0.636	1.67 (0.67 - 4.17)	0.275	
Donor sex					
Female	Ref	Ref	Ref	Ref	
Male	0.82 (0.58 -1.17)	0.281	0.64 (0.28 - 1.47)	0.290	

Significance code: '***' p< 0.001; '**' p<0.01; '*' p<0.05; '.' p<0.1; [+] According to Gratwohl et al., 2009 (34). Abbreviations: SIG-significance; HR-hazard ratio; HLA-human leukocyte antigen; RIC-reduced intensity conditioning; MAC-Myeloablative conditioning; ATG-anti-thymocyte globulin.

Supplementary Table S9. *Multivariate Cox regression analysis with endpoint mild chronic GvHD and severe chronic GvHD in* Acute Leukemia patients *(Heidelberg cohort).*

	Mild chronic GvHD		Severe chronic GvHD		
	HR (95% CI)	P	HR (95% CI)	P	
Pre-conditioning Leptin (per log2)	1.10 (0.90-1.33)	0.373	1.06 (0.76-1.48)	0.721	
Age at transplant (per 10 years)	1.01 (0.82-1.25)	0.919	0.67 (0.47-0.94)	0.023	*
Disease stage[+]					
Early	Ref	Ref	Ref	Ref	
Intermediate/Advanced	1.14 (0.66-1.97)	0.650	0.81 (0.31-2.15)	0.682	
HLA match					
match (10/10)	Ref	Ref	Ref	Ref	
mismatch	0.51 (0.23-1.15)	0.104	0.89(0.26-3.07)	0.857	
Conditioning					
MAC	Ref	Ref	Ref	Ref	
RIC	1.01(0.54-1.90)	0.966	2.16 (0.69-6.74)	0.186	
ATG pre transplant					
Not given	Ref	Ref ***	Ref	Ref	.
given	0.35 (0.20-0.60)	<0.001	0.43 (0.17-1.13)	0.087	
Recipient sex					
Female	Ref	Ref	Ref	Ref	
Male	1.18 (0.68-2.05)	0.553	0.92 (0.37-2.31)	0.863	
Donor sex					
Female	Ref	Ref	Ref	Ref	
Male	0.65 (0.37-1.16)	0.145	0.82 (0.31-2.15)	0.859	

*Significance code: '***' p< 0.001; '**' p<0.01; '*' p<0.05; '.' p<0.1; [+] According to Gratwohl et al., 2009 (34). Abbreviations: SIG-significance; HR-hazard ratio; HLA-human leukocyte antigen; RIC-reduced intensity conditioning; MAC-Myeloablative conditioning; ATG-anti-thymocyte globulin.*

Supplementary Table S10. Patient characteristics of the full Heidelberg cohort (discovery cohort).

n	524
Year alloSCT performed	2002-2013
Median Age at alloSCT (range)	54 (17 to 75)
Recipient Sex	
Female	205 (39%)
Male	319 (61%)
Donor Sex	
Female	168 (32%)
Male	356 (68%)
Disease entity	
AML	161 (31%)
ALL	45 (9%)
Other	318 (61%)
HLA match	
Match (10/10)	400 (76%)
Mismatch	124 (24%)
Conditioning	
MAC	90 (17%)
RIC	434 (83%)
Pre-transplant ATG	
Given	340 (65%)
Not given	184 (35%)
Disease stage before alloSCT[+]	
CR1	157 (30%)
CR2	133 (25%)
>CR2	215 (41%)
unknown	19 (4%)
Serum Leptin Median in pg/ml (range)	14,241 (529.56 to 97,994
Serum Adiponectin Median in ng/ml (range)	4,485.1 (747.9-20,000)
Serum Vitamin D Median in ng/ml (range)	11.9 (1 to 46.3)
Body Mass Index Median in kg/m^2	24.7 (16.3 to 47.6
% Change in Body weight 3 months prior to alloSCT compared to transplantation day Median (range)	-1.2 (-19.3 to 26.1)

[+] *According to Gratwohl et al., 2009 (21). Abbreviations: HLA, human leukocyte antigen; RIC, reduced intensity conditioning; MAC, Myeloablative conditioning; ATG, anti-thymocyte globulin. CR- complete remission before alloSCT*

Supplementary Table S11. Patient characteristics of the full Essen cohort.

n	367
Year alloSCT performed	2009-2013
Median Age at alloSCT (range)	55 (17 to 73)
Recipient Sex	
Female	189 (51%)
Male	178 (49%)
Donor Sex	
Female	122 (33%)
Male	245 (67%)
Disease entity	
AML	367 (100%)
HLA match	
match (10/10)	262 (71%)
mismatch	105 (29%)
Conditioning	
MAC	48 (13%)
RIC	319 (87%)
Pre-transplant ATG	
Given	213 (58%)
Not given	154 (42%)
Disease stage before alloSCT[+]	
CR1	182 (50%)
CR2	97 (26%)
>CR2	88 (24%)
Serum Leptin Median in pg/ml (range)	9564 (91.62 to 92219)
Serum Vitamin D Median in ng/ml (range)	10.3 (0 to 39.2)
Body mass index Median in kg/m^2 (range)	25.7 (17.5 to 47.1)

[+] *According to Gratwohl et al., 2009 (21). Abbreviations: HLA-human leukocyte antigen; RIC-reduced intensity conditioning; MAC-Myeloablative conditioning; ATG-anti-thymocyte globulin. CR- complete remission before alloSCT*