

## Supplementary Information

### Characterization of subcutaneous and omental adipose tissue in patients with obesity and with different degrees of glucose impairment

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#### Additional footnotes

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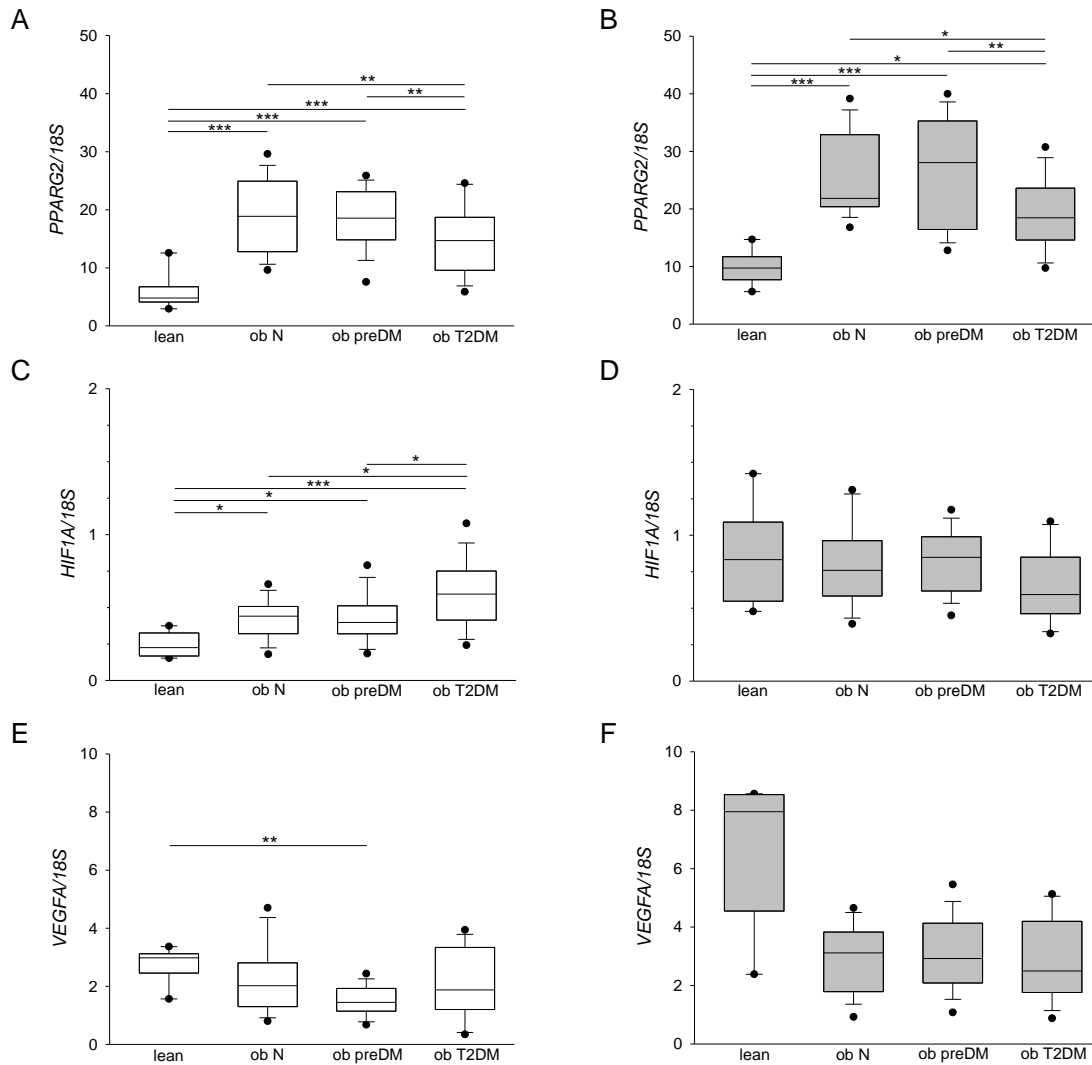
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## Supplementary Tables, Figures and Legends

	Patient Groups				P value					
	lean (n=10)	ob N (n=5)	ob preDM (n=5)	ob T2DM (n=5)	lean vs. ob N	lean vs. ob preDM	lean vs. ob T2DM	ob N vs. ob preDM	ob N vs. ob T2DM	ob preDM vs. ob T2DM
Female sex-n° (%)	6(60)	4(80)	4(80)	2(40)	0.6	0.6	0.61	1.0	0.52	0.52
Age (y)	52±12	42±9	51±11	44±13	0.36	0.36	0.36	0.36	0.36	0.36
Hypertension-n° (%)	2(20)	1(20)	3(60)	4(80)	1.0	0.25	0.09	0.52	0.21	1.0
Dyslipidemia- n° (%)	0(0)	3(60)	4(80)	5(100)	0.02	0.004	<0.001	1.0	0.44	1.0
OSAS- n° (%)	0(0)	1(20)	3(60)	1(20)	0.33	0.02	0.33	0.52	1.0	0.52
BMI (kg/m <sup>2</sup> ) *	24±2	54±19	47±5	57±9	<0.001	0.007	<0.001	0.58	0.63	0.41
FPG (mmol/L)	5.2±0.6	4.9±0.2	5.4±0.6	10.0±4.3	1.0	1.0	0.02	1.0	0.006	0.16
Insulin (mU/L)	-	15±9	16±9	45±22	-	-	-	0.97	0.03	0.02
HOMA <sub>IR</sub> †	-	3.3±1.9	3.6±1.8	17±9	-	-	-	1.0	0.03	0.05
Glucose-AUC (mmol/L)min ‡	-	1138±148	1451±132	-	-	-	-	0.008	-	-
Insulin-AUC (mU/L)min ‡	-	10535±4853	15463±12065	-	-	-	-	0.84	-	-
Waist (cm) §	-	127±19	132±16	154±16	-	-	-	0.10	0.10	0.10
Total Cholesterol (mg/dL)	-	193±27	213±47	225±47	-	-	-	0.48	0.48	0.48
HDL-Cholesterol (mg/dL)	-	51±9	49±15	41±8	-	-	-	0.33	0.33	0.33
LDL-Cholesterol (mg/dL)	-	123±17	140±28	154±38	-	-	-	0.28	0.28	0.28
Triglycerides (mg/dL)	-	93±26	107±42	223±77	-	-	-	0.67	0.006	0.009
hs-CRP (mg/L)	-	4.3±2.6	5.5±3.7	9.3±1.7	-	-	-	0.51	0.04	0.12
TNF-α (ng/L)	-	8.4±2.8	10±4.5	10.7±2.9	-	-	-	0.57	0.57	0.57
IL-6 (ng/L)	-	3.2±1.5	3.1±1.6	4.5±2.3	-	-	-	0.44	0.44	0.44
Leptin (µg/L)	-	33±17	43±10	38±18	-	-	-	0.68	0.68	0.68

**Supplementary Table S1. Characteristics and Clinical Parameters of the Lean Subjects and Obese Patients analyzed by IHC.** Clinical data of control subjects (lean), normoglycemic (ob N), prediabetic (ob preDM) and diabetic (ob T2DM) obese patients are presented as mean values ± SD. Statistical analysis was based on the One Way ANOVA test (age, BMI, insulin, waist, total cholesterol, HDL- and LDL-cholesterol, triglycerides, hs-CRP, TNF-α, IL-6, leptin) or a non-parametric Kruskal-Wallis test (FPG, HOMA<sub>IR</sub>) followed, when statistically significant by, respectively, the Holm-Sidak test or Dunn's multiple comparison post-test. The unpaired t-test and Wilcoxon Mann Whitney test was used to compare respectively glucose- and insulin-AUC values. Pearson's chi-square test or Fisher's exact test were used to compare dichotomous variables between groups.

\*BMI was calculated by dividing weight in kilograms by the square of height in meters. †HOMA<sub>IR</sub> was calculated according to the following formula: [fasting serum insulin (mU/L) x fasting plasma glucose (mmol/L)]/22.5. ‡AUC was calculated using the trapezoidal method. §Waist circumference was measured with a tailor-meter at the midpoint of the line connecting the inferior border of the lowest rib with the superior border of the iliac crest.



**Supplementary Figure S1. *PPARG2*, *HIF1A* and *VEGFA* expression in human SAT and VAT.** *PPARG2* (A,B), *HIF1A* (C,D), *VEGFA* (E,F) mRNA levels in SAT (white boxes, A,C,E) and VAT (grey boxes, B,D,F), normalized to *18S* rRNA content, are plotted for lean subjects, normoglycemic (ob N), prediabetic (ob preDM) and diabetic (ob T2DM) obese patients.

Data are reported as box plot graph with the lowest and highest values (whiskers), the medians (lines) and 5<sup>th</sup> and 95<sup>th</sup> percentiles (black circles outside the whiskers). Statistical analysis was performed using One Way ANOVA test followed by Holm-Sidak post-test in (A) and using Kruskal-Wallis test followed by Dunn's multiple comparison post-hoc test in (B-F), \* $P \leq 0.05$ , \*\* $P \leq 0.01$ , \*\*\* $P \leq 0.001$ . The patients analyzed were: 5 lean, 19 ob N, 19 ob preDM, 18 ob T2DM in (A,C,E) and 4 lean, 17 ob N, 21 ob preDM, 20 ob T2DM in (B,D,F).

	Patient Groups				P value					
	lean (n=6)	ob N (n=5)	ob preDM (n=5)	ob T2DM (n=5)	lean vs. ob N	lean vs. ob preDM	lean vs. ob T2DM	ob N vs. ob preDM	ob N vs. ob T2DM	ob preDM vs. ob T2DM
Female sex-n <sup>o</sup> (%)	6(100)	5(100)	4(80)	3(60)	1.0	0.46	0.18	1.0	0.44	1.0
Age (y)	47±12	35±7	43±12	51±9	0.13	0.13	0.13	0.13	0.13	0.13
Hypertension-n <sup>o</sup> (%)	0(0)	2(40)	3(60)	5(100)	0.18	0.06	0.002	1.0	0.17	0.44
Dyslipidemia- n <sup>o</sup> (%)	0(0)	4(80)	2(40)	3(60)	0.15	0.18	0.06	0.52	1.0	1.0
OSAS- n <sup>o</sup> (%)	0(0)	0(0)	1(20)	1(20)	1.0	0.46	0.46	1.0	1.0	1.0
BMI (kg/m <sup>2</sup> ) *	21±1	46±6	52±7	46±6	<0.001	<0.001	<0.001	0.24	0.88	0.27
FPG (mmol/L)	4.8±0.4	4.9±0.4	5.8±0.5	9.4±3.3	1.0	0.21	0.002	0.50	0.01	1.0
Insulin (mU/L)	-	12±7	27±14	24±11	-	-	-	0.15	0.15	0.15
HOMA <sub>IR</sub> †	-	2.7±1.8	7.1±4.2	9.7±4.1	-	-	-	0.14	0.04	0.28
Glucose-AUC (mmol/L)min ‡	-	1189±69	1524±100	-	-	-	-	0.008	-	-
Insulin-AUC (mU/L)min ‡	-	12465±5126	15426±4876	-	-	-	-	0.38	-	-
Waist (cm) §	-	126±15	131±13	134±17	-	-	-	0.78	0.78	0.78
Total Cholesterol (mg/dL)	-	205±36	186±27	164±22	-	-	-	0.12	0.12	0.12
HDL-Cholesterol (mg/dL)	-	60±18	40±6	46±7	-	-	-	0.06	0.06	0.06
LDL-Cholesterol (mg/dL)	-	123±27	130±38	93±22	-	-	-	0.16	0.16	0.16
Triglycerides (mg/dL)	-	113±56	122±45	126±41	-	-	-	0.92	0.92	0.92
hs-CRP (mg/L)	-	5.4±4.5	9.0±3.7	6.5±3.7	-	-	-	0.38	0.38	0.38
TNF-α (ng/L)	-	5.9±0.4	6.4±1.3	7.1±3.0	-	-	-	0.48	0.48	0.48
IL-6 (ng/L)	-	5.3±4.0	2.8±0.7	4.6±1.5	-	-	-	0.30	0.30	0.30
Leptin (μg/L)	-	53±13	40±7	31±12	-	-	-	0.15	0.03	0.25

**Supplementary Table S2. Characteristics and Clinical Parameters of the Lean Subjects and Obese Patients analyzed by TEM.** Clinical data of control subjects (lean), normoglycemic (ob N), prediabetic (ob preDM) and diabetic (ob T2DM) obese patients are presented as mean values ± SD. Statistical analysis was based on the One Way ANOVA test (age, BMI, insulin, HOMA<sub>IR</sub>, waist, total cholesterol, HDL- and LDL-cholesterol, triglycerides, hs-CRP, IL-6, leptin) or a non-parametric Kruskal-Wallis test (FPG, TNF-α) followed, when statistically significant by, respectively, the Holm-Sidak test or Dunn's multiple comparison post-test. The Wilcoxon Mann Whitney test and unpaired t-test was used to compare respectively glucose- and insulin-AUC values. Pearson's chi-square test or Fisher's exact test were used to compare dichotomous variables between groups.

\*BMI was calculated by dividing weight in kilograms by the square of height in meters. †HOMA<sub>IR</sub> was calculated according to the following formula: [fasting serum insulin (mU/L) x fasting plasma glucose (mmol/L)]/22.5. ‡AUC was calculated using the trapezoidal method. §Waist circumference was measured with a tailor-meter at the midpoint of the line connecting the inferior border of the lowest rib with the superior border of the iliac crest.

	Patient Groups				P value					
	lean (n=4)	ob N (n=20)	ob preDM (n=15)	ob T2DM (n=23)	lean vs. ob N	lean vs. ob preDM	lean vs. ob T2DM	ob N vs. ob preDM	ob N vs. ob T2DM	ob preDM vs. ob T2DM
Female sex-n <sup>o</sup> (%)	2(50)	15(75)	13(87)	14(61)	0.55	0.18	1.0	0.67	0.51	0.15
Age (y)	47±14	43±10	45±9	51±11	0.05	0.05	0.05	0.05	0.05	0.05
Hypertension-n <sup>o</sup> (%)	1(25)	12(60)	7(47)	20(87)	0.3	0.60	0.03	0.66	0.10	0.01
Dyslipidemia- n <sup>o</sup> (%)	0(0)	12(60)	10(67)	21(91)	0.09	0.03	<0.001	0.96	0.03	0.09
OSAS- n <sup>o</sup> (%)	0(0)	4(20)	6(40)	11(48)	1.0	0.25	0.12	0.27	0.11	0.89
BMI (kg/m <sup>2</sup> ) *	24±2	49±12	49±7	49±9	0.06	0.03	0.02	1.0	1.0	1.0
FPG (mmol/L)	5.4±0.9	5.0±0.4	5.8±0.7	8.8±2.8	1.0	1.0	0.02	0.12	<0.001	0.005
Insulin (mU/L)	-	18±13	32±27	32±18	-	-	-	0.13	0.03	1.0
HOMA <sub>IR</sub> †	-	3.9±3.0	8.4±8.3	12±7	-	-	-	0.08	<0.001	0.44
Glucose-AUC (mmol/L)min ‡	-	1158±139	1489±162	-	-	-	-	<0.001	-	-
Insulin-AUC (mU/L)min ‡	-	11916±6291	18788±12589	-	-	-	-	0.12	-	-
Waist (cm) §	-	131±16	137±12	138±17	-	-	-	0.34	0.34	0.34
Total Cholesterol (mg/dL)	-	188±28	205±35	194±46	-	-	-	0.41	0.41	0.41
HDL-Cholesterol (mg/dL)	-	46±10	50±12	41±11	-	-	-	0.09	0.09	0.09
LDL-Cholesterol (mg/dL)	-	121±25	129±34	123±38	-	-	-	0.84	0.84	0.84
Triglycerides (mg/dL)	-	119±43	154±93	174±73	-	-	-	1.0	0.04	0.55
hs-CRP (mg/L)	-	5.5±3.7	7.3±3.5	7.7±2.8	-	-	-	0.17	0.17	0.17
TNF-α (ng/L)	-	8.3±2.1	8.5±2.9	10.3±3.1	-	-	-	0.08	0.08	0.08
IL-6 (ng/L)	-	3.6±1.6	3.8±1.5	4.2±2.6	-	-	-	0.91	0.91	0.91
Leptin (µg/L)	-	38±16	44±13	38±15	-	-	-	0.46	0.46	0.46

**Supplementary Table S3. Characteristics and Clinical Parameters of the Lean Subjects and Obese Patients analyzed by flow cytometry using SAT biopsies.** Clinical data of control subjects (lean), normoglycemic (ob N), prediabetic (ob preDM) and diabetic (ob T2DM) obese patients are presented as mean values ± SD. Statistical analysis was based on the One Way ANOVA test (age, waist, total cholesterol, HDL- and LDL-cholesterol, leptin) or a non-parametric Kruskal-Wallis test (BMI, FPG, insulin, HOMA<sub>IR</sub>, triglycerides, hs-CRP, TNF-α, IL-6) followed, when statistically significant by, respectively, the Holm-Sidak test or Dunn's multiple comparison post-test. The unpaired t-test and Wilcoxon Mann Whitney test was used to compare respectively glucose- and insulin-AUC values. Pearson's chi-square test or Fisher's exact test were used to compare dichotomous variables between groups.

\*BMI was calculated by dividing weight in kilograms by the square of height in meters. †HOMA<sub>IR</sub> was calculated according to the following formula: [fasting serum insulin (mU/L) x fasting plasma glucose (mmol/L)]/22.5. ‡AUC was calculated using the trapezoidal method. §Waist circumference was measured with a tailor-meter at the midpoint of the line connecting the inferior border of the lowest rib with the superior border of the iliac crest.

	Patient Groups				P value					
	lean	ob N	ob preDM	ob T2DM	lean vs. ob N	lean vs. ob preDM	lean vs. ob T2DM	ob N vs. ob preDM	ob N vs. ob T2DM	ob preDM vs. ob T2DM
	(n=9)	(n=23)	(n=21)	(n=30)						
Female sex-n° (%)	4(44)	18(78)	17(81)	17(57)	0.10	0.08	0.71	1.0	0.18	0.13
Age (y)	49±12	41±10	44±9	51±10	0.17	0.50	0.52	0.56	0.002	0.05
Hypertension-n° (%)	1(11)	10(43)	12(57)	27(90)	0.12	0.04	<0.001	0.55	<0.001	0.02
Dyslipidemia- n° (%)	0(0)	12(52)	11(52)	25(83)	0.01	0.01	<0.001	0.77	0.03	0.04
OSAS- n° (%)	0(0)	4(17)	5(24)	13(43)	0.30	0.29	0.02	0.72	0.09	0.26
BMI (kg/m <sup>2</sup> ) *	24±2	47±9	50±9	49±9	0.004	<0.001	<0.001	0.79	1.0	1.0
FPG (mmol/L)	5.2±0.6	5.0±0.4	5.8±0.7	9.8±4.4	1.0	0.66	<0.001	0.07	<0.001	<0.001
Insulin (mU/L)	-	17±12	32±25	41±42	-	-	-	0.02	0.004	1.0
HOMA <sub>IR</sub> †	-	3.9±2.7	8.5±7.1	16±16	-	-	-	0.009	<0.001	0.31
Glucose-AUC (mmol/L)min ‡	-	1152±134	1444±151	-	-	-	-	<0.001	-	-
Insulin-AUC (mU/L)min ‡	-	11299±5890	19192±12247	-	-	-	-	0.02	-	-
Waist (cm) §	-	129±15	137±11	137±16	-	-	-	0.11	0.11	0.11
Total Cholesterol (mg/dL)	-	184±28	197±43	193±43	-	-	-	0.54	0.54	0.54
HDL-Cholesterol (mg/dL)	-	46±9	48±13	41±12	-	-	-	0.13	0.13	0.13
LDL-Cholesterol (mg/dL)	-	118±25	124±47	123±37	-	-	-	0.81	0.81	0.81
Triglycerides (mg/dL)	-	116±43	158±108	178±74	-	-	-	0.95	0.006	0.16
hs-CRP (mg/L)	-	5.4±3.8	7.0±3.6	7.6±3.0	-	-	-	0.10	0.10	0.10
TNF-α (ng/L)	-	8.7±3.5	8.7±3.7	9.7±2.8	-	-	-	0.20	0.20	0.20
IL-6 (ng/L)	-	3.8±3.0	3.5±1.3	4.4±2.6	-	-	-	0.57	0.57	0.57
Leptin (µg/L)	-	38±16	45±18	37±15	-	-	-	0.25	0.25	0.25

**Supplementary Table S4. Characteristics and Clinical Parameters of the Lean Subjects and Obese Patients analyzed by flow cytometry using VAT biopsies.** Clinical data of control subjects (lean), normoglycemic (ob N), prediabetic (ob preDM) and diabetic (ob T2DM) obese patients are presented as mean values ± SD. Statistical analysis was based on the One Way ANOVA test (age, waist, total cholesterol, HDL-cholesterol, leptin) or a non-parametric Kruskal-Wallis test (BMI, FPG, insulin, HOMA<sub>IR</sub>, LDL-cholesterol, triglycerides, hs-CRP, TNF-α, IL-6) followed, when statistically significant by, respectively, the Holm-Sidak test or Dunn's multiple comparison post-test. The unpaired t-test was used to compare glucose- and insulin-AUC values. Pearson's chi-square test or Fisher's exact test were used to compare dichotomous variables between groups.

\*BMI was calculated by dividing weight in kilograms by the square of height in meters. †HOMA<sub>IR</sub> was calculated according to the following formula: [fasting serum insulin (mU/L) x fasting plasma glucose (mmol/L)]/22.5. ‡AUC was calculated using the trapezoidal method. §Waist circumference was measured with a tailor-meter at the midpoint of the line connecting the inferior border of the lowest rib with the superior border of the iliac crest.

	Patient Groups			P value		
	ob N (n=18)	ob preDM (n=15)	ob T2DM (n=13)	ob N vs. ob preDM	ob N vs. ob T2DM	ob preDM vs. ob T2DM
Female sex-n <sup>o</sup> (%)	15(83)	13(87)	10(77)	1.0	0.68	0.64
Age (y)	38 ± 11	46 ± 10	48 ± 11	0.07	0.04	0.62
Hypertension-n <sup>o</sup> (%)	6(33)	6(40)	12(92)	0.97	0.004	0.006
Dyslipidemia- n <sup>o</sup> (%)	11(61)	8(53)	11(85)	0.93	0.24	0.11
OSAS- n <sup>o</sup> (%)	2(11)	4(27)	5(38)	0.38	0.10	0.69
BMI (kg/m <sup>2</sup> ) *	49 ± 12	50 ± 9	51 ± 7	0.51	0.51	0.51
FPG (mmol/L)	4.9 ± 0.3	5.8 ± 0.7	12.1 ± 5.5	0.02	<0.001	0.007
Insulin (mU/L)	19 ± 12	36 ± 26	57 ± 63	0.01	0.008	1.0
HOMA <sub>IR</sub> †	4.1 ± 2.9	9.6 ± 7.6	23 ± 24	0.007	<0.001	0.44
Glucose-AUC (mmol/L)min ‡	1174 ± 147	1529 ± 194	-	<0.001	-	-
Insulin-AUC (mU/L)min ‡	12962 ± 6034	22513 ± 11685	-	0.01	-	-
Waist (cm) §	129 ± 15	135 ± 14	140 ± 13	0.09	0.09	0.09
Total Cholesterol (mg/dL)	187 ± 30	197 ± 27	179 ± 40	0.36	0.36	0.36
HDL-Cholesterol (mg/dL)	45 ± 13	48 ± 11	41 ± 14	0.42	0.42	0.42
LDL-Cholesterol (mg/dL)	119 ± 30	121 ± 31	110 ± 33	0.66	0.66	0.66
Triglycerides (mg/dL)	134 ± 77	155 ± 80	185 ± 86	0.14	0.14	0.14
hs-CRP (mg/L)	4.9 ± 3.7	7.5 ± 3.4	7.8 ± 2.9	0.06	0.06	0.06
TNF-α (ng/L)	8.3 ± 2.8	9.0 ± 3.7	9.7 ± 3.1	0.42	0.42	0.42
IL-6 (ng/L)	2.9 ± 1.0	4.0 ± 1.2	5.0 ± 2.9	0.03	0.05	1.0
Leptin (µg/L)	40 ± 17	46 ± 17	39 ± 16	0.50	0.50	0.50

**Supplementary Table S5. Characteristics and Clinical Parameters of the Obese Patients analyzed by *in vitro* adipogenic culturing from SAT biopsies.** Clinical data of normoglycemic (ob N), prediabetic (ob preDM) and diabetic (ob T2DM) obese patients are presented as mean values ± SD. Statistical analysis was based on the One Way ANOVA test (age, waist, total cholesterol, HDL- and LDL-cholesterol, leptin) or a non-parametric Kruskal-Wallis test (BMI, FPG, insulin, HOMA<sub>IR</sub>, triglycerides, hs-CRP, TNF-α, IL-6) followed, when statistically significant by, respectively, the Holm-Sidak test or Dunn's multiple comparison post-test. The unpaired t-test and Wilcoxon Mann Whitney test was used to compare respectively glucose- and insulin-AUC values. Pearson's chi-square test or Fisher's exact test were used to compare dichotomous variables between groups.

\*BMI was calculated by dividing weight in kilograms by the square of height in meters. †HOMA<sub>IR</sub> was calculated according to the following formula: [fasting serum insulin (mU/L) x fasting plasma glucose (mmol/L)]/22.5. ‡AUC was calculated using the trapezoidal method. §Waist circumference was measured with a tailor-meter at the midpoint of the line connecting the inferior border of the lowest rib with the superior border of the iliac crest.

	Patient Groups			P value		
	ob N (n=20)	ob preDM (n=25)	ob T2DM (n=23)	ob N vs. ob preDM	ob N vs. ob T2DM	ob preDM vs. ob T2DM
Female sex-n° (%)	17(85)	20(80)	13(57)	0.72	0.09	0.15
Age (y)	42±8	46±10	52±10	0.19	0.005	0.08
Hypertension-n° (%)	7(35)	12(48)	21(91)	0.57	<0.001	0.003
Dyslipidemia- n° (%)	11(55)	14(56)	20(87)	0.81	0.05	0.04
OSAS- n° (%)	4(20)	8(32)	10(43)	0.57	0.19	0.60
BMI (kg/m <sup>2</sup> ) *	49±11	48±8	49±9	0.78	0.78	0.78
FPG (mmol/L)	5.0±0.2	5.8±0.6	10.3±4.8	0.014	<0.001	<0.001
Insulin (mU/L)	17±11	31±25	45±45	0.04	0.004	0.92
HOMA <sub>IR</sub> †	3.9±2.8	8.2±7.1	17±18	0.02	<0.001	0.13
Glucose-AUC (mmol/L)min ‡	1156±132	1510±177	-	<0.001	-	-
Insulin-AUC (mU/L)min ‡	12029±6169	20095±12337	-	0.03	-	-
Waist (cm) §	128±15	134±12	137±18	0.15	0.15	0.15
Total Cholesterol (mg/dL)	191±28	202±41	194±47	0.65	0.65	0.65
HDL-Cholesterol (mg/dL)	48±9	49±12	41±12	0.76	0.09	0.06
LDL-Cholesterol (mg/dL)	123±24	127±46	123±40	0.99	0.99	0.99
Triglycerides (mg/dL)	116±46	160±100	176±82	0.55	0.03	0.56
hs-CRP (mg/L)	5.1±3.5	6.8±3.6	8.0±2.8	0.34	0.03	0.89
TNF-α (ng/L)	7.7±2.5	8.3±3.2	9.7±3.1	0.09	0.09	0.09
IL-6 (ng/L)	3.0±1.1	3.5±1.2	4.6±2.5	0.08	0.08	0.08
Leptin (µg/L)	41±17	42±17	38±16	0.71	0.71	0.71

**Supplementary Table S6. Characteristics and Clinical Parameters of the Obese Patients analyzed by *in vitro* adipogenic culturing from VAT biopsies.** Clinical data of normoglycemic (ob N), prediabetic (ob preDM) and diabetic (ob T2DM) obese patients are presented as mean values ± SD. Statistical analysis was based on the One Way ANOVA test (age, waist, total cholesterol, HDL-cholesterol, leptin) or a non-parametric Kruskal-Wallis test (BMI, FPG, insulin, HOMA<sub>IR</sub>, LDL-cholesterol, triglycerides, hs-CRP, TNF-α, IL-6) followed, when statistically significant by, respectively, the Holm-Sidak test or Dunn's multiple comparison post-test. The unpaired t-test and Wilcoxon Mann Whitney test was used to compare respectively glucose- and insulin-AUC values. Pearson's chi-square test or Fisher's exact test were used to compare dichotomous variables between groups.

\*BMI was calculated by dividing weight in kilograms by the square of height in meters. †HOMA<sub>IR</sub> was calculated according to the following formula: [fasting serum insulin (mU/L) x fasting plasma glucose (mmol/L)]/22.5. ‡AUC was calculated using the trapezoidal method. §Waist circumference was measured with a tailor-meter at the midpoint of the line connecting the inferior border of the lowest rib with the superior border of the iliac crest.



		Patient groups			
		lean	ob N	ob preDM	ob T2DM
SAT	CD73+	90.0 (87.0-91.7)	97.8 (94.4-98.9)	96.3 (88.7-97.8)	92.9 (92.2-94.5)
	CD90+	92.6 (90.0-95.3)	97.7 (96.5-99.1)	99.0 (96.1-99.6)	99.3 (95.0-99.7)
	CD105+	42.1 (24.9-59.4)	51.9 (25.3-59.9)	42.0 (17.3-49.6)	30.3 (21.9-52.2)
	CD271+	27.2	37.3 (22.6-44.6)	42.3 (24.2-44.4)	31.9 (26.4-45.5)
	CD146+	1.0	0.5 (0.3-0.9)	0.5 (0.2-0.8)	0.6 (0.4-0.9)
VAT	CD73+	97.1 (95.3-97.5)	94.3 (86.5-98.4)	93.8 (85.9-96.9)	94.2 (92.4-95.5)
	CD90+	92.8 (82.6-98.3)	95.6 (91.3-97.8)	95.2 (90.2-98.6)	95.8 (93.3-98.4)
	CD105+	47.8 (33.6-59.8)	63.7 (59.1-75.6)*	63.9 (53.9-77.5)**	67.8 (61.1-72.2)**
	CD271+	42.4 (28.4-46.5)	70.5 (56.9-78.8)***	68.2 (47.4-83.4)***	59.9 (55.0-71.5)**
	CD146+	0.6 (0.03-1.3)	1.0 (0.4-1.9)	0.6 (0.2-1.5)	1.3 (0.5-1.8)

**Supplementary Table S7. Quantification by flow cytometry of CD73+, CD90+, CD105+, CD271+ and CD146+ cells in the CD45-/31-/34+ subpopulation of human SAT and VAT in the lean controls and obese patients.** Percentages of CD45-/31-/34+ cells expressing CD73, CD90, CD105, CD271 and CD146 antigens in SAT- and VAT-SVFs of lean control subjects, normoglycemic (ob N), prediabetic (ob preDM) and diabetic (ob T2DM) obese patients. Data are reported as median percentage (25<sup>th</sup>-75<sup>th</sup> percentile). The statistical analysis was based on One Way ANOVA (Fisher LSD method) and Kruskal-Wallis test (Dunn's method); ob vs lean: \* $P \leq 0.05$ , \*\* $P \leq 0.01$ , \*\*\* $P \leq 0.001$ .

	FITC	PE	PerCP-Cy5.5	APC
Unstained	/	/	/	/
Negative	IgG1	IgG1	IgG1	IgG1
Sample 1	CD45	CD31	CD34	/
Sample 2	CD45 CD31	CD90	CD34	CD73
Sample 3	CD45 CD31	CD146	CD34	CD271
Sample 4	CD45 CD31	/	CD34	CD105

**Supplementary Table S8. Antibody flow cytometry panel for immunophenotyping of SVF cells.** SVF cells isolated from AT of the patients analyzed were incubated with a combination of monoclonal mouse anti-human fluorochrome-conjugated antibodies specific for the different antigens in order to perform multiparametric flow cytometry analysis. Isotype-matched FITC-, PE-, PerCP-Cy5.5- and APC-IgG1 monoclonal antibodies were used as a negative control. Unstained sample was used for auto-fluorescence control.

GENE	FORWARD (5'-3')	REVERSE (5'-3')	PRIMER F/R (nM)	ANNEALING (°C)	AMPLICON SIZE (bp)
<i>RNA18S</i>	CGGCTACCACATCCAAGGAA	GCTGGAATTACCGGGCT	100/100	60	186
<i>HIF1A</i>	TTACCATGCCCCAGATTCAG	GGTCTTTGCTTCTGTGTCTTC	300/300	58	180
<i>VEGFA</i>	TCACCATGCAGATTATGCGGA	TGTTGTGCTGTAGGAAGCTCA	300/300	58	75
<i>PPARG2</i>	ACCCAGAAAGCGATTCTTCA	AGTGGTCTTCCATTACGGAGAGATC	900/900	60	87
<i>FABP4</i>	GAAGTCAAGAGCACCATAACC	CCACCACCAGTTTATCATCC	300/300	53	113
<i>ADIPOQ</i>	ACAATGGCACACCAGGCCGTGA	AGCGGCTTCTCCAGGCTCTCCTT	300/300	58	179

**Supplementary Table S9. Real Time PCR conditions.** Primer sequences and concentrations, annealing temperatures and amplicon sizes are outlined for each mRNA quantified by real time PCR. *RNA18S* = 18S ribosomal RNA; *HIF1A* = hypoxia inducible factor 1 alpha subunit; *VEGFA* = vascular endothelial growth factor A; *PPARG2* = peroxisome proliferator activated receptor gamma isoform 2; *FABP4* = fatty acid binding protein 4; *ADIPOQ* = adiponectin, C1Q and collagen domain containing.