

SUPPLEMENTARY MATERIAL:**Supplemental Table S1. List of 275 Ca²⁺-Toolkit Genes Analysed in both the UALCAN and OCCAMS Datasets**

<u>Gene:</u>	<u>Protein Name:</u>
ACCN1	Acid-sensing Ion Channel 2
ACCN2	Acid-sensing Ion Channel 1
ACCN3	Acid-sensing Ion Channel 3
ACCN4	Acid-sensing Ion Channel 4
ACTN1	Actinin α 1
ACTN2	Actinin α 2
ACTN3	Actinin α 3
ACTN4	Actinin α 4
AHCYL1	Adenosylhomocysteinase-Like 1
AKAP5	A-Kinase Anchoring Protein 5
AKAP6	A-Kinase Anchoring Protein 6
AKAP9	A-Kinase Anchoring Protein 9
ANXA1	Annexin A1
ANXA10	Annexin A10
ANXA11	Annexin A11
ANXA13	Annexin A13
ANXA2	Annexin A2
ANXA3	Annexin A3
ANXA4	Annexin A4
ANXA5	Annexin A5
ANXA6	Annexin A6

ANXA7	Annexin A7
ANXA8	Annexin A8
ANXA9	Annexin A9
ASPH	Aspartate β -Hydroxylase
ATF4	Activating Transcription Factor 4
ATP2A1	Sarco-endoplasmic-reticulum Ca^{2+} ATPase 1
ATP2A2	Sarco-endoplasmic-reticulum Ca^{2+} ATPase 2
ATP2A3	Sarco-endoplasmic-reticulum Ca^{2+} ATPase 3
ATP2B1	Plasma Membrane Ca^{2+} ATPase 1
ATP2B4	Plasma Membrane Ca^{2+} ATPase 4
ATP2C1	Secretory Pathway Ca^{2+} ATPase 1
ATP2C2	Secretory Pathway Ca^{2+} ATPase 2
ATP6V0A1	ATPase H^+ Transporting V0 Subunit A1
ATP6V0A2	ATPase H^+ Transporting V0 Subunit A2
ATP6V0A4	ATPase H^+ Transporting V0 Subunit A4
ATP6V0B	ATPase H^+ Transporting V0 Subunit B
ATP6V0C	ATPase H^+ Transporting V0 Subunit C
C22ORF32	Essential MCU Regulator
CA1	Carbonic Anhydrase 1
CA10	Carbonic Anhydrase 10
CA11	Carbonic Anhydrase 11
CA12	Carbonic Anhydrase 12
CA13	Carbonic Anhydrase 13
CA14	Carbonic Anhydrase 14
CA2	Carbonic Anhydrase 2

CA3	Carbonic Anhydrase 3
CA4	Carbonic Anhydrase 4
CA6	Carbonic Anhydrase 6
CA7	Carbonic Anhydrase 7
CA8	Carbonic Anhydrase 8
CA9	Carbonic Anhydrase 9
CACNA1A	Voltage-Gated Ca ²⁺ Channel, P/Q Type, A 1A Subunit.
CACNA1B	Voltage-Gated Ca ²⁺ Channel, N-Type, A 1B Subunit.
CACNA1C	Voltage-Gated Ca ²⁺ Channel, L-Type, A 1C Subunit.
CACNA1D	Voltage-Gated Ca ²⁺ Channel, L-Type, A 1D Subunit.
CACNA1H	Voltage-Gated Ca ²⁺ Channel, T-Type, A 1H Subunit.
CACNA2D1	Voltage-Gated Ca ²⁺ Channel Auxiliary Subunit A 2 Δ 1
CACNA2D2	Voltage-Gated Ca ²⁺ Channel Auxiliary Subunit A 2 Δ 2
CACNA2D3	Voltage-Gated Ca ²⁺ Channel Auxiliary Subunit A 2 Δ 3
CACNA2D4	Voltage-Gated Ca ²⁺ Channel Auxiliary Subunit A 2 Δ 4
CACNB1	Voltage-Gated Ca ²⁺ Channel, L-Type, β 1 Subunit
CACNB2	Voltage-Gated Ca ²⁺ Channel, L-Type, β 2 Subunit
CACNB3	Voltage-Gated Ca ²⁺ Channel, L-Type, β 3 Subunit
CACNB4	Voltage-Gated Ca ²⁺ Channel, L-Type, β 4 Subunit
CACNG4	Voltage-Gated Ca ²⁺ Channel Auxiliary Subunit Gamma 4
CALB1	Calbindin 1
CALB2	Calbindin 2
CALM1	Calmodulin 1
CALM2	Calmodulin 2
CALM3	Calmodulin 3

CALR	Calreticulin
CAMK1	Calmodulin-dependent Protein Kinase 1
CAMK1D	Calmodulin-dependent Protein Kinase 1D
CAMK2A	Calmodulin-dependent Protein Kinase 2A
CAMK2B	Calmodulin-dependent Protein Kinase 2B
CAMK2D	Calmodulin-dependent Protein Kinase 2D
CAMK4	Calmodulin-dependent Protein Kinase 4
CANX	Calnexin
CASQ2	Calsequestrin 1
CBARA1	Mitochondrial Ca ²⁺ Uptake 1
CCDC109A	Mitochondrial Ca ²⁺ Uniporter
CCDC90A	Mitochondrial Ca ²⁺ Uniporter Regulator 1
CD38	Cluster of Differentiation 38
CHRNA1	Nicotinic Cholinergic Receptor A1
CHRNA10	Nicotinic Cholinergic Receptor A10
CHRNA3	Nicotinic Cholinergic Receptor A3
CHRNA5	Nicotinic Cholinergic Receptor A5
CHRNA7	Nicotinic Cholinergic Receptor A7
CHRNA9	Nicotinic Cholinergic Receptor A9
CNGA1	Cyclic Nucleotide Gated Channel Subunit α 1
CNGB1	Cyclic Nucleotide Gated Channel Subunit β 1
CREB1	CAMP Responsive Element Binding Protein 1
CREB3	CAMP Responsive Element Binding Protein 3
CREB3L1	CAMP Responsive Element Binding Protein 3-Like 1
CREB3L2	CAMP Responsive Element Binding Protein 3-Like 2

CREB3L3	CAMP Responsive Element Binding Protein 3-Like 3
CREB3L4	CAMP Responsive Element Binding Protein 3-Like 4
CREB5	CAMP Responsive Element Binding Protein 5
EFHA1	Mitochondrial Ca ²⁺ Uptake 2
EFHA2	Mitochondrial Ca ²⁺ Uptake Family Member 3
FKBP1A	12 kDa FK506-Binding Protein
FKBP1B	12.6 kDa FK506-Binding Protein
GNA11	G Protein Subunit α 11
GNA14	G Protein Subunit α 14
GNAQ	G Protein Subunit α Q
GNB1	G Protein Subunit β 1
GNB2	G Protein Subunit β 2
GNB3	G Protein Subunit β 3
GNB4	G Protein Subunit β 4
GNB5	G Protein Subunit β 5
GNG10	G Protein Subunit Gamma 10
GNG11	G Protein Subunit γ 11
GNG12	G Protein Subunit γ 12
GNG2	G Protein Subunit γ 2
GNG3	G Protein Subunit γ 3
GNG4	G Protein Subunit γ 4
GNG5	G Protein Subunit γ 5
GNG7	G Protein Subunit γ 7
GOPC	Golgi-Associated PDZ and Coiled-coil Motif Containing
GPR132	G Protein-Coupled Receptor 132

GPR4	G Protein-Coupled Receptor 4
GPR65	G Protein-Coupled Receptor 65
GPR68	G Protein-Coupled Receptor 68
GRIN1	N-Methyl-D-Aspartate Receptor 1
GRIN2A	N-Methyl-D-Aspartate Receptor Subunit 2A
GRIN2D	N-Methyl-D-Aspartate Receptor Subunit 2D
HOMER1	Homer Scaffold Protein 1
HOMER2	Homer Scaffold Protein 2
HOMER3	Homer Scaffold Protein 3
HSP90AA1	Heat Shock 90kDa Protein 1, α
HSP90AB1	Heat Shock 90kDa Protein 1, β
HSPA13	Heat Shock 70kDa Protein A13
HSPA14	Heat Shock 70kDa Protein A14
HSPA1A	Heat Shock 70kDa Protein 1A
HSPA1B	Heat Shock 70kDa Protein 1B
HSPA1L	Heat Shock 70kDa Protein 1L
HSPA2	Heat Shock 70kDa Protein A2
HSPA4	Heat Shock 70kDa Protein A4
HSPA5	Heat Shock 70kDa Protein A5
HSPA6	Heat Shock 70kDa Protein A6
HSPA7	Heat Shock 70kDa Protein A7
HSPA8	Heat Shock 70kDa Protein A8
HSPA9	Heat Shock 70kDa Protein A9
HVCN1	Hydrogen Voltage Gated Channel 1
ITPR1	Inositol 1,4,5-Trisphosphate Receptor Type 1

ITPR2	Inositol 1,4,5-Trisphosphate Receptor Type 2
ITPR3	Inositol 1,4,5-Trisphosphate Receptor Type 3
JPH1	Junctophilin 1
JPH2	Junctophilin 2
JPH3	Junctophilin 3
JPH4	Junctophilin 4
KCNIP2	Potassium Voltage-Gated Channel Interacting Protein 2
KCNIP3	Potassium Voltage-Gated Channel Interacting Protein 3
KCNIP4	Potassium Voltage-Gated Channel Interacting Protein 4
LETM1	Mitochondrial Proton/Ca ²⁺ Exchanger Protein
MCOLN1	Mucolipin 1
MCOLN2	Mucolipin 2
MRVI1	Murine Retrovirus Integration Site 1 Homolog
NCS1	Neuronal Ca ²⁺ Sensor 1
NFATC1	Nuclear Factor of Activated T Cells 1
NFATC2	Nuclear Factor of Activated T Cells 2
NFATC3	Nuclear Factor of Activated T Cells 3
NFATC4	Nuclear Factor of Activated T Cells 4
ORAI1	Ca ²⁺ -Release Activated Ca ²⁺ Modulator 1
ORAI2	Ca ²⁺ -Release Activated Ca ²⁺ Modulator 2
ORAI3	Ca ²⁺ -Release Activated Ca ²⁺ Modulator 3
P2RX7	Purinergic Receptor P2X, Ligand Gated Ion Channel, 7
PICK1	Protein Interacting with C Kinase 1
PKD1	Polycystin 1
PKD2	Polycystin 2

PLCB1	Phospholipase C β 1
PLCB2	Phospholipase C β 2
PLCB3	Phospholipase C β 3
PLCD1	Phospholipase C δ 1
PLCD3	Phospholipase C δ 3
PLCD4	Phospholipase C δ 4
PLCE1	Phospholipase C ϵ 1
PLCG1	Phospholipase C γ 1
PLN	Phospholamban
PPP1CA	Protein Phosphatase 1 Catalytic Subunit α
PPP2CA	Protein Phosphatase 2 Catalytic Subunit α
PPP3CA	Protein Phosphatase 3 Catalytic Subunit α
PPP3CB	Protein Phosphatase 3 Catalytic Subunit β
PPP3CC	Protein Phosphatase 3 Catalytic Subunit γ
PRKCG	Protein Kinase C γ
PRKCI	Protein Kinase C ι
PRKCZ	Protein Kinase C ζ
PVALB	Parvalbumin
RGS1	Regulator of G Protein Signalling 1
RGS16	Regulator of G Protein Signalling 16
RGS2	Regulator of G Protein Signalling 2
RGS4	Regulator of G Protein Signalling 4
RYR1	Ryanodine Receptor 1
RYR2	Ryanodine Receptor 2
RYR3	Ryanodine Receptor 3

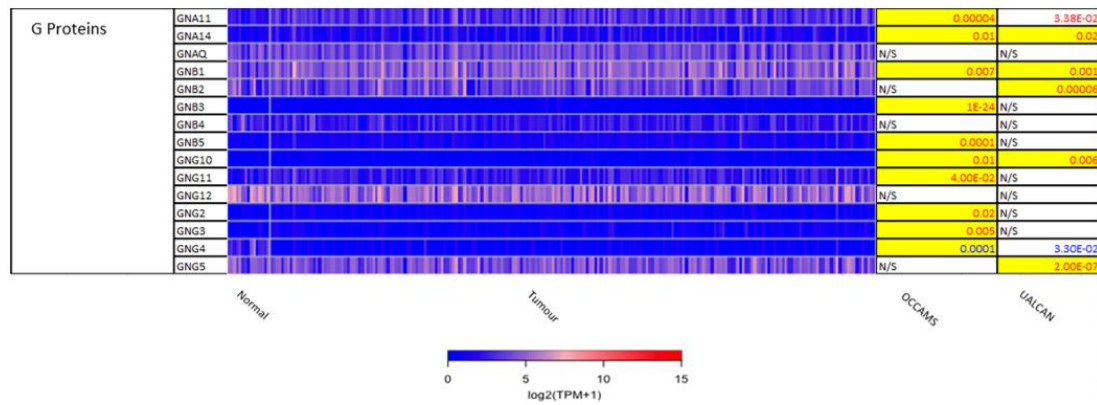
S100A1	S100 Ca ²⁺ Binding Protein A1
S100A10	S100 Ca ²⁺ Binding Protein A10
S100A11	S100 Ca ²⁺ Binding Protein A11
S100A12	S100 Ca ²⁺ Binding Protein A12
S100A13	S100 Ca ²⁺ Binding Protein A13
S100A14	S100 Ca ²⁺ Binding Protein A14
S100A16	S100 Ca ²⁺ Binding Protein A16
S100A2	S100 Ca ²⁺ Binding Protein A2
S100A3	S100 Ca ²⁺ Binding Protein A3
S100A4	S100 Ca ²⁺ Binding Protein A4
S100A5	S100 Ca ²⁺ Binding Protein A5
S100A6	S100 Ca ²⁺ Binding Protein A6
S100A7	S100 Ca ²⁺ Binding Protein A7
S100A8	S100 Ca ²⁺ Binding Protein A8
S100A9	S100 Ca ²⁺ Binding Protein A9
S100B	S100 Ca ²⁺ Binding Protein B
S100P	S100 Ca ²⁺ Binding Protein P
SEPN1	Selenoprotein N1
SLC24A1	Sodium-Potassium-Ca ²⁺ Exchanger 1
SLC24A3	Sodium-Potassium-Ca ²⁺ Exchanger 3
SLC24A5	Sodium-Potassium-Ca ²⁺ Exchanger 5
SLC24A6	Na(+)/K(+)/Ca(2+)-Exchange Protein 6
SLC25A4	ADP/ATP translocase 1
SLC25A5	ADP/ATP translocase 2
SLC26A1	Solute Carrier Family 26 Member 1

SLC26A10	Solute Carrier Family 26 Member 10
SLC26A2	Solute Carrier Family 26 Member 2
SLC26A3	Solute Carrier Family 26 Member 3
SLC26A4	Solute Carrier Family 26 Member 4
SLC26A5	Solute Carrier Family 26 Member 5
SLC26A6	Solute Carrier Family 26 Member 6
SLC26A7	Solute Carrier Family 26 Member 7
SLC26A8	Solute Carrier Family 26 Member 8
SLC26A9	Solute Carrier Family 26 Member 9
SLC4A1	Solute Carrier Family 4 Member 1 (Diego Blood Group)
SLC4A10	Solute Carrier Family 4 Member 10
SLC4A11	Solute Carrier Family 4 Member 11
SLC4A2	Solute Carrier Family 4 Member 2
SLC4A3	Solute Carrier Family 4 Member 3
SLC4A4	Solute Carrier Family 4 Member 4
SLC4A5	Solute Carrier Family 4 Member 5
SLC4A7	Solute Carrier Family 4 Member 7
SLC4A8	Solute Carrier Family 4 Member 8
SLC4A9	Solute Carrier Family 4 Member 9
SLC8A1	Sodium-Ca ²⁺ Exchanger 1
SLC8A2	Sodium-Ca ²⁺ Exchanger 2
SLC9A1	Sodium/Hydrogen Exchanger 1
SLC9A2	Sodium/Hydrogen Exchanger 2
SLC9A3	Sodium/Hydrogen Exchanger 3
SLC9A4	Sodium/Hydrogen Exchanger 4

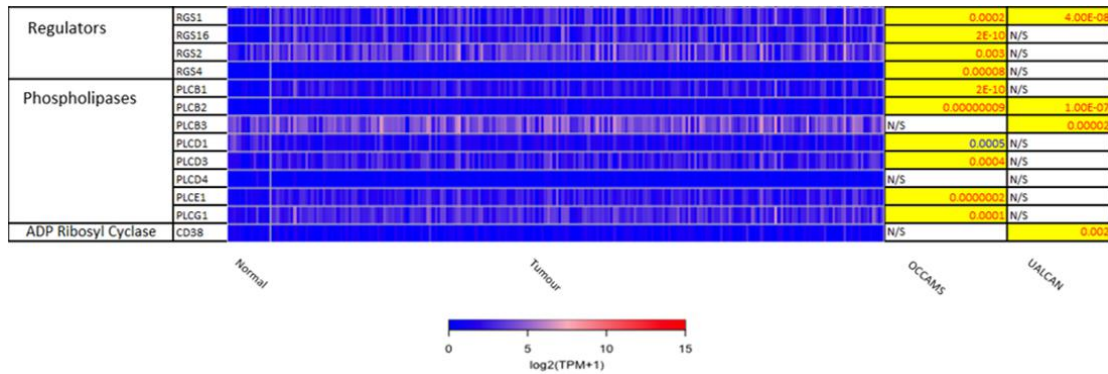
SLC9A5	Sodium/Hydrogen Exchanger 5
SLC9A6	Sodium/Hydrogen Exchanger 6
SLC9A7	Sodium/Hydrogen Exchanger 7
SLC9A8	Sodium/Hydrogen Exchanger 8
SLC9A9	Sodium/Hydrogen Exchanger 9
SRI	Sorcin
STIM1	Stromal Interaction Molecule 1
STIM2	Stromal Interaction Molecule 2
STOML1	Stomatin-Like 1
STOML2	Stomatin-Like 2
TPCN1	Two Pore Segment Channel 1
TPCN2	Two Pore Segment Channel 2
TRPA1	Transient Receptor Potential Cation Channel Subfamily A Member 1
TRPC1	Transient Receptor Potential Ion Channel Subfamily C Member 1
TRPC4	Transient Receptor Potential Ion Channel Subfamily C Member 4
TRPC6	Transient Receptor Potential Ion Channel Subfamily C Member 6
TRPM2	Transient Receptor Potential Ion Channel Subfamily M Member 2
TRPM4	Transient Receptor Potential Ion Channel Subfamily M Member 4
TRPM5	Transient Receptor Potential Cation Channel Subfamily M Member 5
TRPM6	Transient Receptor Potential Ion Channel Subfamily M Member 6
TRPM7	Transient Receptor Potential Ion Channel Subfamily M Member 7
TRPV1	Transient Receptor Potential Ion Channel Subfamily V Member 1
TRPV2	Transient Receptor Potential Ion Channel Subfamily V Member 2
TRPV3	Transient Receptor Potential Ion Channel Subfamily V Member 3
TRPV4	Transient Receptor Potential Cation Channel Subfamily V Member 4

TRPV5	Transient Receptor Potential Cation Channel Subfamily V Member 5
TRPV6	Transient Receptor Potential Ion Channel Subfamily V Member 6
VDAC1	Voltage Dependent Anion Channel 1
VDAC2	Voltage Dependent Anion Channel 2
VDAC3	Voltage Dependent Anion Channel 3

A)

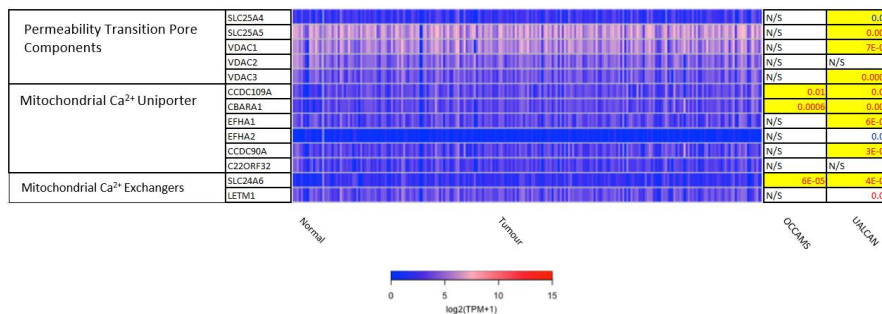


B)



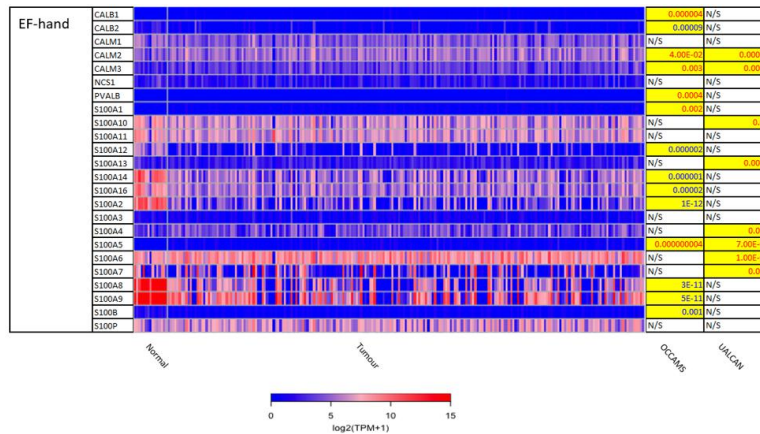
Supplemental Figure S1. Expression of Ca²⁺-Signal Transducers in OAC.

Heatmap depicting the expression-levels of genes encoding proteins involved in Ca²⁺ signal transduction: G Proteins (*Panel A*) and Regulators, Phospholipases and ADP Ribosyl Cyclase (*Panel B*). Please see Figure 2 for details. Expression data on GNG7 was not available from the OCCAMS dataset and was downregulated in the UALCAN data ($P = 3.42e-2$; not significant after adjustment for MOT).

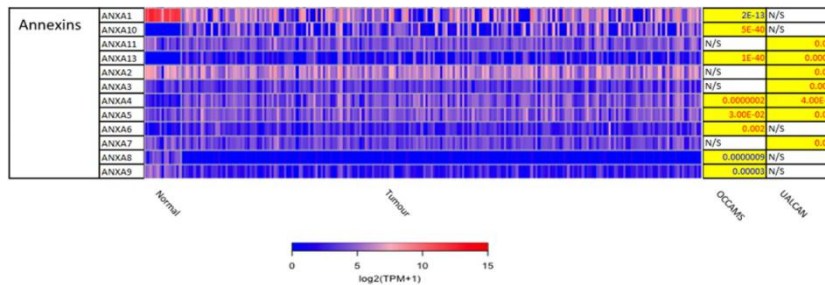


Supplemental Figure S2. Expression of Mitochondria-Associated, Ca²⁺-Toolkit Genes in OAC. Please see Figure 2 for details.

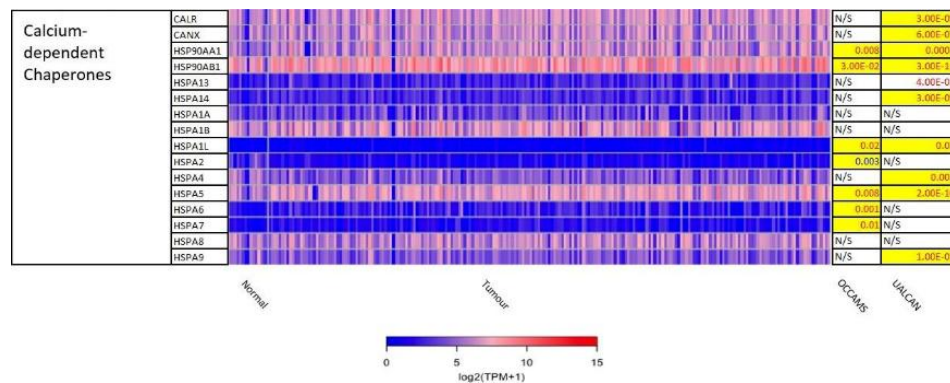
A)



B)

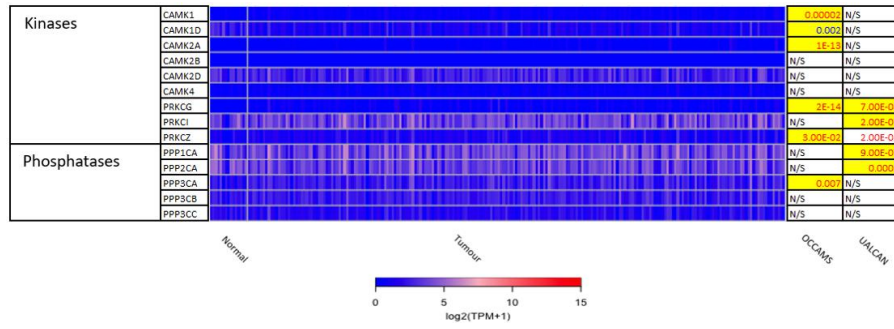


Supplemental Figure S3. Expression of Cytosolic Ca²⁺-sensors and -buffers in OAC. Please see Figure 2 for details. SRI was not available in the OCCAMS data but was upregulated in the UALCAN data ($P = 1e-8$).

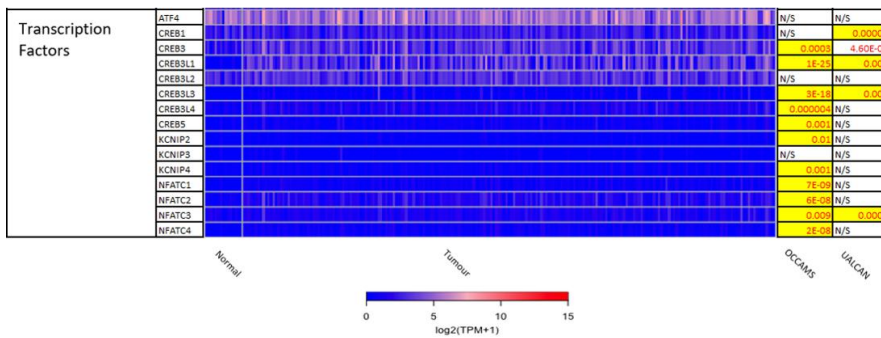


Supplemental Figure S4. Expression of Ca²⁺-dependent Chaperones in OAC. For details, please see Figure 2.

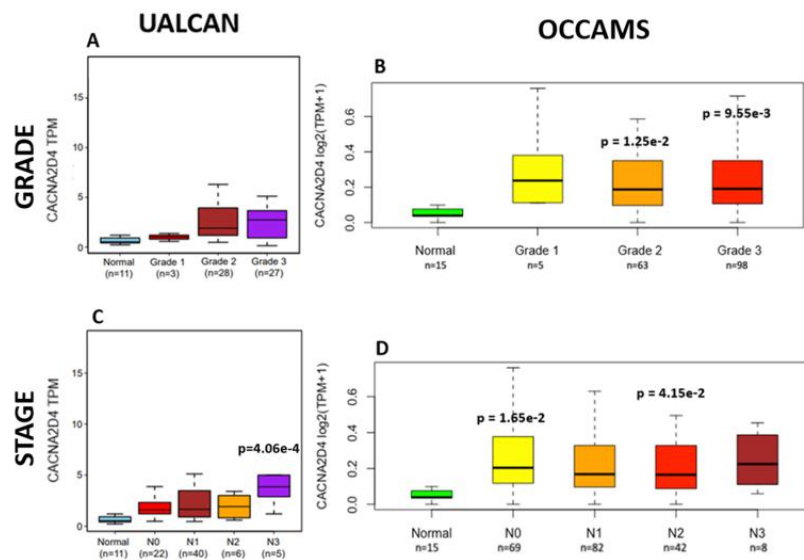
A)



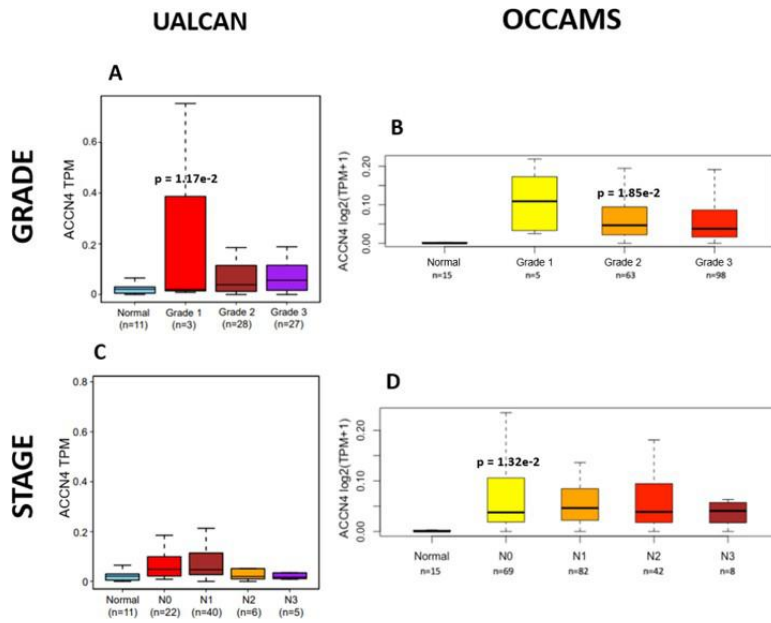
B)



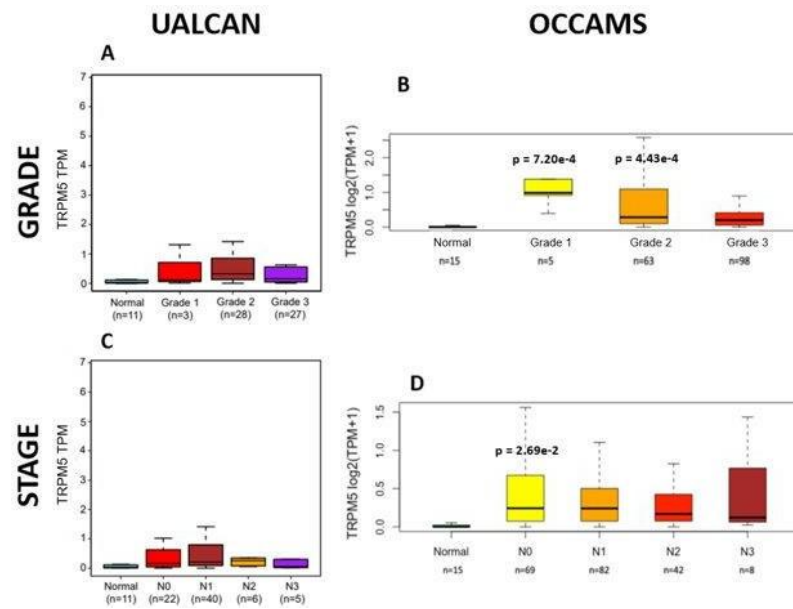
Supplemental Figure S5. Expression of Ca^{2+} -dependent effectors in OAC. See Figure 2 for details.



Supplemental Figure S6. OAC-Tumour, Grade and Nodal-Metastatic-Stage Boxplots for CACNA2D4. Details as described in Figure 7.



Supplemental Figure S7. OAC-Tumour, Grade and Nodal-Metastatic-Stage Boxplots for ACCN4. Details as described in *Figure 7*.



Supplemental Figure S8. OAC-Tumour, Grade and Nodal-Metastatic-Stage Boxplots for TRPM5. Details as described in *Figure 7*.