

Supplementary Figure 1A: HbA_{1c} measurements in wild-type and *Trpc1/4/5/6*^{-/-} mice. HbA_{1c} measurements in non-diabetic (Citrate) and diabetic (STZ) wild type and *Trpc1/4/5/6*^{-/-} mice. t=0 indicates the time point before STZ treatment, t=1 and t=2 indicate the time 10 and 20 weeks after STZ treatment, respectively. Number of mice was as follows: t0: WT 24 mice, *Trpc1/4/5/6*^{-/-} 27 mice; t1 citrate: WT 7 mice, *Trpc1/4/5/6*^{-/-} 8 mice; t1 STZ: WT 17 mice, *Trpc1/4/5/6*^{-/-} 8 mice; t2 citrate: WT 7 mice, *Trpc1/4/5/6*^{-/-} 8 mice; t2 STZ: WT 15 mice, *Trpc1/4/5/6*^{-/-} 6 mice (*p<0.05, **p<0.01 and ***p<0.001).

Supplementary Figure 2A: Nanostring-based TRPC expression analysis in retina extracts. Total RNA was isolated from the retina of 32-week old diabetic *Ins2*^{Akita} and wild-type mice for TRPC expression analysis. Counts represent the relative fluorescence units after normalization with five reference genes. Samples from diabetic mice and wild-type control mice are shown in white bars and black bars, respectively (n=4; for both diabetic and wild-type mice, ***p<0.001).

Nanostring probe sequence

Supplementary Table 1. TRPC specific DNA sequences for Nanostring

| Probe | Sequence |
|-------|--|
| Trpc1 | 5'AGAGCTAGCCCGTCAGTGCAAAATGTTTGCTAAAGATTTGCTCGCA CAAGCCCGGAATTCTCGTGAAGTTATCCTGAACCATACATCT AGCGAT 3' |
| Trpc2 | 5'TCCGCCTGGGCCACGAGGTCATCACTGATGTTCTGCTGGCCAATGT CAAATTCGACTTTTCGGCAGATCCACGAAGCCCTGCTAGTGGCTGTGG ACACAAA 3' |
| Trpc3 | 5'GAATGAAGGTGAACTGAAAGAAATCAAGCAGGATATCTCCAGCCTT CGTTATGAACTTTTAGAAGATAAGAGCCAAGCGACGGAGGAATTAGC CATCTTG 3' |
| Trpc4 | 5'CTCGGTCACTTCAACCACCAGATTGCAACTTTGCGGAGATGATGAT GGACTAGCATGGCCTGAAGCATGGCTCAGTTCTATTACAAAAGAAAT GTCAACG 3' |
| Trpc5 | 5'ATCCGGCATCTGCTCCTCAAATTCGAACTTTTGGACTCGTCAGAG GACGTATTTGAACTTGGGGAGAGGCTTGTGACTTGCTCATGCACAA ATGGGGT 3' |
| Trpc6 | 5'CGATGATCAATAGTTCATTCCAGGAAATTGAGGATGATGCGGACGT GGAGTGGAAGTTTGCAAGGGCCAAATTGTGGTTTTCTACTTTGAGG AGGGGAG 3' |
| Trpc7 | 5'GGTATGAAAATCTCTCAGGCTTACGGCAACAGTCTATCGCTGTGAA ATTCTGGCTGTCTTTGGAGTCTCCATAGGCCTCCTTTTCTCGCCAT AGCCTA 3' |

qPCR gene primer sequence

Supplementary Table 2. Human gene primer sequences

| Probe | Forward | Reverse |
|-------|--|------------------------------------|
| TRPC1 | 5'- TTTTTATGTTTAAGAGGGGCAGTT- 3' | 5'- GCCTACATTTGCTGGTCTTCA-3' |
| TRPC2 | 5'- CTGCTCAACATGCTCATTGC-3' | 5'-CACTCCACGTCAGCATCATC- 3' |
| TRPC3 | 5'-TGCATTTTATTTGTCTGCTTTGA- 3' | 5'- ATTGGGCTTTTCAACACAATG-3' |
| TRPC4 | 5'-CCACGAAGATTACGTGACCA-3' | 5'-CCCAGAGCACTACGGAAAAT- 3' |
| TRPC5 | 5'-GTTCAAGGCTGAGTACGAGGA- 3' | 5'-CTTCTCCGTCTACCGTCAGG- 3' |
| TRPC6 | 5'-ACACGGTTCTCCCATGATGT-3' | 5'- CAGGAGGGTATGCACAATTC- 3' |
| TRPC7 | 5'-GTCCCTGTCCAGCGAAGAC-3' | 5'- TGGTAGTCTGGCTAACTCGT- 3' |
| H3F3A | 5'- AGACGTTATCAGAAGTCCACTGAA- 3' | 5'-GAGCAATTTCTCGCACCAG-3' |
| AIP | 5'-AGGCAGTGCCACTTATCCAC-3' | 5'-CAGGCAATGGCATCGTAGTA- 3' |
| CXXC1 | 5'-TCTGTCTGGGACATGAAGAAGT-3' | 5'-GGACTCTGAGGGCGTCACT- 3' |

Supplementary Table 3. Bovine gene primer sequences

| Probe | Forward | Reverse |
|-------|-------------------------------------|--|
| TRPC1 | 5'-GAAGGACTGGGATGCGTTC- 3' | 5'-TTGGCAAATGCAAAAAGTCC-3' |
| TRPC2 | 5'-CCCTGGACAGACCTTTCGT-3' | 5'-GAATCAGCCAGGGACATCAG-3' |
| TRPC3 | 5'-TAAATGGCTCCCTTCTGACC- 3' | 5'- TCTCTGGCGTAAGTGAAATACTGT- 3' |
| TRPC4 | 5'-GATCTCTCCACGGTCCAGTC- 3' | 5'-ATCCGAGTCTGCGGAGTTAG-3' |
| TRPC5 | 5'- GTTCAAGGCTGAGTACGAGGA- 3' | 5'- CTGGTCCAGCAGGTCTTTG-3' |
| TRPC6 | 5'-TGTAGCCCATCCAAACTGC-3' | 5'-AGCCCGGAAAGGTTCTCATA-3' |
| TRPC7 | 5'-GGTCCGAATGCAAGGAAAT-3' | 5'-CAGGTTCCACAGGTGCAATA-3' |
| H3F3A | 5'-AAGCGTATCTGGTGGGTTTG- | 5'-GGGCATGATGGTGA CTCTCT-3' |

| | | |
|-------|---------------------------------|----------------------------|
| | 3' | |
| AIP | 5'- CAGCCTCTCATCTTCGACATC-3' | 5'-ACGGGTCTTGCTGGTACG-3' |
| CXXC1 | 5'-CACGGAGGAGTCCCAGTTC- 3' | 5'-TCACGTGCTTCACTTTCACC-3' |

Supplementary Table 4. Rat gene primer sequences

| Probe | Forward | Reverse |
|-------|----------------------------------|---------------------------------------|
| TRPC1 | 5'-CTGAAGGATGTGCGAGAGGT- 3' | 5'-GCACGCCAGCAAGAAAAG-3' |
| TRPC2 | 5'-GGAGGATTTTCCGGTTCATT-3' | 5'-AGTCCGACTTCTTGGCTTTG-3' |
| TRPC3 | 5'-GCTGAGAAGCAAAGGCTTGA- 3' | 5'-TCCCTTGTAGGCATTGATCC-3' |
| TRPC4 | 5'- ACCATGTTTGGCACATATAACG-3' | 5'-AGCGATCAGCATGTTCAGG-3' |
| TRPC5 | 5'-AGGACCCTATCCTCACAGCA-3' | 5'-TTTTCCACCTTGCTCAGCTC-3' |
| TRPC6 | 5'-TACTGGTGTGCTCCTTGACG-3' | 5'- GAACTTCATGAATGGACCTCGT- 3' |
| TRPC7 | 5'- AGACATCTCAAGCCTTCGCTAT-3' | 5'- AGCTCTCCGGTAGCTTGAGAC-3' |
| H3F3A | 5'-CATGTTCACTAACCCCTGACC- 3' | 5'- AAGAAAATCCCCGTTAGTGTTTT- 3' |
| AIP | 5'-GCATAGCTCCCTGGGTCAT-3' | 5'-GATGAGGGGTTGAGGGTTCT- 3' |
| CXXC1 | 5'-CCTTCGCTCTAGTGCTGACC-3' | 5'-CTGAATGCAGGGCTGAGAG-3' |

Supplementary Table 5. Mouse gene primer sequences

| Probe | Forward | Reverse |
|-------|--|---------------------------------------|
| TRPC1 | 5'- CTGAAGGATGTGCGAGAGGT- 3' | 5'- CACGCCAGCAAGAAAAGC-3' |
| TRPC2 | 5'- GTGTGGATCGAGGGCTTG-3' | 5'- ACAGGATGACCACGTCCAG-3' |
| TRPC3 | 5'- GTGAACTGAAAGAAATCAAGCA-3' | 5'- CGTCGCTTGGCTCTTATCTT- 3' |
| TRPC4 | 5'- AAACTTTTGGTTCAGAAAGGTGTC -3' | 5'- ACAGTTACAGCGGACCTCGT- 3' |
| TRPC5 | 5'- GGCGATGCATTACTCTACGC-3' | 5'- GCTAAGCAGAAGTTCCACAGC-3' |
| TRPC6 | 5'- AGGCAAAGGTTAGCGACAA-3' | 5'- GGCATAAAAGTCATCTTGCTGAA -3' |
| TRPC7 | 5'- AATGGCGATGTGAACTTGC-3' | 5'- GTTTGATTCCGGCTCAGACTTG-3' |
| H3F3A | 5'- GCCATCTTCAATTGTGTTG- 3' | 5'- AGCCATGGTAAGGACACCTC- 3' |

| | | |
|-----------|----------------------------|---------------------------------|
| | 3' | 3' |
| AIP | 5'- CGCCTGTGGTAAGCAGAGA-3' | 5'- AAGCGAGCTTTGTCCTCCT-3' |
| CXXC 1 | 5'- TAGTGCCGACCGCTGACT-3' | 5'- GGCCTCTCCCCTAACTGAAT- 3' |