VI. Supplementary Figure S1

| Name | Accession Used | metazoa>chordata>vertebrata | metazoa>chordata>tunicata | metazoa>chordata>cephalochordata | metazoa>echinodermata | metazoa>hemichordata | metazoa>arthropoda>hexapoda | metazoa>arthropoda>cnelicerata | metazoa>arthropoda>crustacea | metazoa>nematoda | metazoa>priapulida | metazoa>annelida | metazoa>mollusca | metazoa>brachiopoda | metazoa>platynelmintne | metazoa>cnidaria metazoa> plogazoa | netazoa/piacozoa | metazoa>poritera | Metazoan progenitor | choanotlagellida | llasterea | Holozoan progenitor | 'ungi>dikarya | rungi>cnytridiomycota | ungi>niucoronnycouna | 'ungi>kickxeilomycotina | rungai progemior cristidiscoidea | anisozoa>anisomonadidae | amoebozoa>acanthamoebidae | amoebozoa>entamoebidae | amoebozoa>mycetozoa>dictyosteliida | Unnikont progenitor | viridiplantae>streptophyta | viridiplantae>chlorophyta | hodophyta | stramenopiles>bacillariophyta | | alveolata>apicomplexa | alveolata>ciliophora | | SAK progenitor | lapiopiiyceae seteroloposes | icici olobosca eligipanozos kinetoniestide | diplomonadida | aipionionadia narahasalia | ECA | |
|--------------------|----------------|-----------------------------|---------------------------|----------------------------------|-----------------------|----------------------|-----------------------------|--------------------------------|------------------------------|----------------------|------------------------|----------------------|------------------|---------------------|------------------------|---------------------------------------|------------------|------------------|---------------------|------------------|-----------|---------------------|---------------|-----------------------|----------------------|--------------------------|-------------------------------------|-------------------------|---------------------------|------------------------|---------------------------------------|---------------------|----------------------------|---------------------------|-----------|-------------------------------|--------|-----------------------|--------------------------|-----------------|----------------|--------------------------------|---|-----------------|------------------------------|------------|---|
| Calmodulin family | NP 008819.1 | P | P | P | P | P | P | P | P | P | P | P | P | P | P i | P . | י ניכ | P | P | P | Р | P | P ` | P I |) | Р <i>1</i> | - \ > [|) [|) [|) F |) D | P | P | P | P | P | P | P | P. | - J | D |) <u> </u> |) [|) [|) [|) <u> </u> | , |
| ERp57 (PDIA3) | NP_005304.3 | ı D | Р | ı D | ı D | ı D | ı ı | ı D | · D | ı D | ı D | D | ı D | ı D | D 1 | | י וכ | · · | , P | ı D | D | , Pi | ı D | , . Б 1 | , , D | . , D <i>E</i> | י כוכ | , D | , , | , , = | , D | , P | ı D | Р | Р | Δ | Р | Р | D | | D 1 | ' 2 C | י סכ | י סכ | , D D | , D E | , |
| SERCA | NP_733765.1 | ı D | ı D | ı D | ı D | ı D | ı ı | ı D | ı D | ı D | ı D | ı D | ı D | ı D | ı ı Di | | י וכ | D . | ı P | ı D | D | ı I | ı D | ı ı Di | ' ' D | , , D <i>E</i> | י כוכ | ' > = | ' | ' } | , <u>'</u> | , P | ı D | ı D | ' P | P | ı D | p ' | D | | י סוס | י ככ | י סכ |) <u> </u> | , | , , | , |
| CaMK / CDPK | NP_001308498.1 | ı D | ı D | ı D | ı D | ı D | י י סו | ı D | ı ı | ı D | ı D | ı D | ı D | ı D | , , D 1 | , i | י וכ | ь , Б | ı D | ı D | D | , i | ı D | , , D 1 | D 1 | , , D <i>1</i> | ا ح | | , , , , | , D | | ' D | ı D | ı D | ı D | ı D | ı D | D I | D | , D <i>E</i> | , D 1 | י כוכ | י סכ | , | <u>'</u> | , D E | , |
| Calstabin | NP_463460.1 | D | D D | D | D | D | DI | r D | D I | r D | r D | Г D | Г D | Г D | r i D i | , i | י וכ | D . | ı D | Г D | D . | r D | r D | г і D і | - I | г <i>г</i> D <i>Ц</i> | , / | | , [|) <mark>/</mark> | , D | , D | Р | Р | Р | Р | Г D | D | D | | , D 1 |) D [| י ס כ |) <u> </u> |) [| | , |
| PPP2R3 | NP 002709.2 | D | D D | D | D | D | DI | r D | D I | r D | r D | Г D | Г D | Г D | r i D i | , i | י וכ | D . | ı D | г D | ٨ | , D | Λ | г і D і | - I | г <i>г</i> D <i>Ц</i> |) <u> </u> |) [| , [| , _^ | , D | , D | Р | Р | Р | Р | Г D | D | D | | , D 1 |) D [| י ס כ |) |) [| | , |
| Calcineurin A | NP 000935.1 | Г | Г | Р | Р | Р | D I | Г D | F D | Г D | Г D | Г D | Г D | Г D | r i D i | г г о г | ו כ ו כ | Г <i>I</i> | r D | Г D | D · | r D | A D | r i D i | Г I D I | r r | - r |) [| | | | P | | | | _ | Г | Г I | D | | - - | | , L |) [| | | , |
| Calcineurin B | | Г | Г | Г | Г | Г | F I | Г D | F I | Г D | Г D | Г D | Г D | Г D | r i | г г рг | י ד וכ | r i | r D | Г D | Г . D | r I D I | Г D | r i | ר ו D | г <i>г</i> р <i>г</i> | - r |) F |) F |) F | , L | r D | D | А | В | ^ | _ | Г | D | | |) [|) [|) F |) E | | |
| TMX1 | NP_000936.1 | Г | Г | r D | r D | r D | r i | r D | r I | Г D | r D | r D | r D | r D | r i | | י וכ | r i | r D | ^ | Г D | r I | r D | r i | - I | |) [|) | | , | | P | Г | Г | Г | A | A | r D | Г В | - <i>-</i> | י וכ | - r | , L | , , | | , r | |
| | NP_110382.3 | P | P | P | P | P | וח | ۲ D | P | ۲ D | ۲ D | r D | Р В | Р Р | ים וח | 7 F | ור ור | P 1 | P | A | Г. В | P | ^ | ים וח | | A r | ~ F | , , | \ F | | | P | P | P | Υ • | P | P D | ^ | | 7 <i>1</i> | ו כ | - F | ' F | , / | | · • | |
| Calreticulin | NP_004334.1 | Ρ | P | Ρ | P | P | P 1 | Ρ | P | Υ | Ρ | P | P | P | P 1 | 7 F | י ור | P 1 | ۲ - | ۲ - | Α. | P | A | P | P | P # | 7 F | <i>P</i> | \ | ′ F | ' P | 7 | Ρ | Ρ | A | P | P | A | 2 | P # | ا ک ا | - F | 1 F | <i>F</i> | \ | ' <i>F</i> | |
| Calnexin | NP_001737.1 | Ρ | P | Ρ | Ρ | Ρ | P 1 | ۲ | P | ۲ | ۲ | P | Ρ | Ρ | P 1 | 7 H | ן כור | P 1 | P 5 | Α. | A . | P | P | P / | A | P <i>F</i> | ~ <mark>/</mark> | <u> </u> | | \ <i>\</i> | \ P | 7 | Ρ | או | P | A | P | À | A | P # | י ה | ~ F | | \ | \ | , F | |
| TRIC | NP_076979.1 | Ρ | 2 | Ρ | Ρ | Ρ | P 1 | ۲ | P | ۲ | ۲ 5 | P | Ρ | Ρ | P 1 | 7 H | י ור | P 1 | P | A | Γ. | P | P | PI | ا ۲ م | P F | 7 F | ' F | ' F | | \ P | 7 | A | Ļ | ו והו | P | A | A | A | P # | ا م | - F | | \ / | \ <u> </u> | , F | |
| Homer (WH1 dom.) | NP_004263.1 | Ρ | P | P | P | P | P 1 | Ρ | P | ۲ - • | ^ | P | P | P | P 1 | 7 F | - I | ^ | ۲ - | ۲ - • | P . | P | ^ | P 1 | P / | A | ~ F | ′ F | <u> </u> | | LP | ۲ 5 | A | A | P | A | A | A | A I | P # | _ <u>/</u> | A | 4 | \ <i>\</i> | \ | ' <i>F</i> | |
| ERdj5 | NP_061854.1 | Ρ | P | Ρ | Ρ | Ρ | P 1 | ۲ | P | ۲. | A | P | Ρ | Ρ | P 1 | 7 H | | A | P - | P . | A . | 2 | A . | A A | Α / | A A | 4 <i>f</i> | \ | y F | (<u> </u> | A | 7 | Ρ | Ρ | A | A | 2 | 5 | 2 | P # | י ה | | \ | \ / | \ <u> </u> | · • | |
| Sarcalumenin | NP_001092284.1 | Ρ | 2 | Ρ | Ρ | Ρ | P 1 | ۲ | P | ۲ | ۲ | P | Ρ | Ρ | P 1 | 7 H | וי | P 1 | P - | Ρ | Υ . | 2 | A | P 1 | ا ۲ م | P F | 7 F | ' F | ′ F | (F | , P | 7 | P | ץ | Ρ | 2 | P . | 2 | A) | P # | ו כ | | N | | | \ <i>\</i> | |
| IP3R | NP_001161744.1 | Ρ | 2 | Ρ | 2 | Ρ | P 1 | ۲ | P | ۲ | ۲ | P | Ρ | Ρ | P 1 | 7 H | וי | P 1 | P - | Ρ | Υ . | 2 | AL | P 1 | 1 | A | ٦ F | ' F | ′ F | 1 A | Ľ | ۲ - | A | אַן | A | A | 7 | A | | , | י ה | _ | ' | . / | | \ <i>\</i> | |
| ORAI | NP_116179.2 | Ρ | 2 | Ρ | Ρ | Ρ | P 1 | 2 | P | ۲ | ۲ | Ρ | Ρ | Ρ | P 1 | 7 F | ן כ | P 1 | <i>P</i> | Ρ | Ρ, | <i>P</i> . | Α. | A A | Α / | A A | A / | | \ A | \ A | A | <i>P</i> | P | P | A | P | P | P | 2 / | A [/ | ا 4 |) | \ <i>\</i> | \ <i>\</i> | A A | \ <i>\</i> | |
| NCS1 | NP_055101.2 | Ρ | 2 | Ρ | 2 | Ρ | P 1 | ۲ | P | ۲ | ۲ | P | Ρ | Ρ | P 1 | 7 H | וי | P 1 | P - | Ρ | Υ . | P | P _ | P 1 | 7 I | P <i>F</i> | | \ <u> </u> | ' F | | \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | 7 | A | A | A | A | A | A | A | 4 4 | 4 / | 4 / | \ <i>\</i> | \ / | | \ <i>\</i> | |
| Calcipressin | NP_001272320.2 | Ρ | P | Ρ | Ρ | Ρ | P 1 | ۲ | P | ۲ | ۲ | Ρ | Ρ | Ρ | P 1 | P 1 | ا ^د | P 1 | P - | Ρ | Ρ, | P - | Ρ | PI | P | PF | <i>P</i> | | Ĺ | ' P | ΥĽ | P | A | A | A | A | A | A | A A | 4 4 | 4 / | 4 / | \ <i>\</i> | \ <i>\</i> | A A | \ | |
| STIM | NP_001264890.1 | Ρ | P | Ρ | Ρ | Ρ | P | Ρ_ | P - | Ρ_ | P - | P - | Ρ_ | P - | P 1 | P 1 | ا د | P 1 - | P - | P - | Ρ. | P - | Α. | Α, | Α <i>i</i> | Α Α | 4 / | \ <i>P</i> | . Α | \ A | ۱ A | . A | A | Α | A | A | A | Α . | Α / | A A | 4 / | 4 / | \ <i>F</i> | \ <i>F</i> | \ A | \ <i>/</i> | |
| ERp44 | NP_055866.1 | Ρ | P | Ρ_ | Ρ | Ρ | P | P - | P - | ۲ - | P - | P - | Ρ_ | P - | P - | P H | ا د | P / - | P - | P - | P . - | P - | Α. | Α / | Α, | Α Α | 4 / | \ A | . Α | Λ Α | ١A | . A | Α | Α | Α | A | A | Α . | Α / | A A | 4 / | 4 / | \ / | \ | A A | \ | |
| RyR | NP_000531.2 | P | Р | P - | P - | P - | PΙ | Ρ | Ρ | Ρ | P | Р | P - | P - | Ρ/ | A I | 2 - | P / - | P - | P - | Ρ. | P | Α. | Α | Α, | A A | 4 4 | Α Α | . Α | Λ Α | ١A | . A | Α | Α | Α | Α | A | A | Α / | Α Α | 4 / | 4 / | \ / | \ <i>F</i> | Α Α | \ | |
| Sorcin | | Р | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L-type VGCC (pore) | NP_000060.2 | | | | | | ΡI | P | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | A | | | | | | | | | |
| TRPC | NP_003297.1 | - | Р | - | Р | Р | P | Р | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | A A | | | | | | | | | |
| WFS2 (CISD2) | NP_001008389.1 | Р | | | Р | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | A A | | | | | | | | | |
| CREC family | NP_001186601.1 | Р | Р | Р | Р | Р | PΙ | Р | P | Р | | | | | | | | | | | | | | | | | | | | | | | | | | | | A A | | | | | | | | | |
| Bcl2 | NP_000624.2 | Р | Р | Р | Р | Р | PΙ | Ρ_ | P | Р | | | | | | | | | | | | | | | | | | | | | | | | | | | | A A | | | | | | | | | |
| SelN | NP_065184.2 | Р | Р | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | A A | | | | | | | | | |
| Wolframin | NP_005996.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | A A | | | | | | | | | |
| Neurabin | NP_115984.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | A A | | | | | | | | | |
| Tespa1 (KRAP dom.) | _ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | A A | | | | | | | | | |
| Calsequestrin | NP_001222.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | A A | | | | | | | | | |
| S100 | NP_006262.1 | Р | P | Α | Α | Α | A | A , | A . | Α. | Α. | Α | Α | Α | A A | A / | 4 / | A , | Α | A . | Α. | A | Α. | A A | 4 / | A A | 4 <i>A</i> | A | A | A | A | A | Α | Α | Α | Α | Α | A | A / | 4 4 | 4 / | 4 / | \ / | \ <i>F</i> | Α Α | 1 | |

VII. Supplementary Figure S2

Na⁺/Ca²⁺ antiporter P-type ATPase ABQ30334, ABQ30333 from *Acidiphilium cryptum JF-5* (α-proteobacteria) Na⁺/H⁺ exchanger P-type ATPase ADN08417, ADN08416 from *Sulfurimonas autotrophica DSM 16294* (ε-proteobacteria) P-type ATPase Permease AFL87427, AFL87428 from Terriglobus roseus DSM 18391 (acidobacteria) K⁺ channel K⁺ channel P-type ATPase ring gating ring gating AEY94042, AEY94041, AEY94040 from Streptomyces hygroscopicus subsp. jinggangensis 5008 (actinobacteria) Na⁺/PO₄³⁻ cotransporter P-type ATPase APC18922, APC18921, APC18920 from *Pseudomonas frederiksbergensis* (γ-proteobacteria) P-type ATPase P-type ATPase

AEN97664, AEN97663 from Roseburia hominis A2-183 (firmicutes)

VIII. Supplementary Figure S3

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               IASKAGMHWLSTIPTHHINALIFFIISNLTIDEFAFIIPVGHLVINVSIPCLLELV-KIVVILRESSGIGLVRASIGYFLFL VTSYMSLSTCAEPYTRRALMTEIAA GCLSLOILPGNEGF LKFLGKTYFTIPVGHLLVINVSIPCLLELV-KIVVILVLGAVPLLF RWWTKVNFSVVEMVKSLTRSSIVKLILVWITAVVLFCWFYVYRSE 64UVSVFFT VTSYMSLSTCAEPYTRRALMTEIAA GCLSLOILPGNEGF LKFLGKTYFTIPVGHLLVINVSIPCLLELV-KIVVILVLGAVPLLF RWWTKVNFSVVEMVKSLTRSSIVKLILVWITAVVLFCWFYVYRSE 64UVSVFFT VTSYMSLSTCAEPYTRRALMTEIAA GCLSLOILPGNEGF LKFLGKTYFTIPVGHLLVINVSIPCLLFLY FYLFFT VTSYMSLSTCAEPYTRRALMTEIAA GCLSLOILPGNEGF LKFLGKTYFTIPVGHLLVINVSIPCLLFLY FYLFT VTSYMSLSTCAEPYTRRALMTEIAA GCLSLOILPGNEGF LKFLGKTYFTIPVGHLLVINVSIPCLLFLY FYLFT VTSYMSLSTCAEPYTRRALMTEIAA GCLSLOILPGNEGF LKFLGKTYFT VTSYMSLSTCAEPYTRRALMTEIAA GCLSVILFT VTSYMSLSTCAEPYTRRALMTEIAA GCLSVILFT VTSYMSLSTCAEPYTRRALMTEIAA GCLSVILFT VTSYMSLSTCAEPYTRRALMTEIAA GCLSVILFT VTSYMSLSTCAEPYTRRALMTEIAA GCLSVILFT VTSYMSLSTCAEPYTRRALMTEIAA GCLSVILFT VTSYMSLSTCAEPYTRALMTEIAA GCLSVILFT VTSYMSLT VTSYMSLT VTSYMSLT VTSYMSLT VTSYMSLT VTSYMSLT VTSYMSLT VTSYMSLT VTSYMSLT VTSYMS
              FYHRLÎNLIVS<mark>I</mark>P-NVIPLSVRÇSVLVAISWSRH<mark>MLPLVSYPL</mark>SELTIISGALTSVSKALACGLVVVL SCILALNRATOKYITMLOLITAITT<mark>ACL</mark>LVLPY<mark>MT</mark>SSFKDTPRFN 603LFLVPV<mark>F</mark>VAIDSLGLASEOLRWGSTALACGLVVVL SCILALNRATOKYITMLOLITAITTACLLVLPYMTSSFKDTPRFN 603LFLSVRCSVLVAISWSRHWLPLVSTAVNVLAIVPVFVAIDSLGLASEOLRWGSTALACGLVVVL SCILALNRATOKYITMLOLITAITTACLLVLPYMTSSFKDTPRFN 603LFLSVRCSVLVAISWSKRWHGVVLAIVPVFVAIDSLGLASEOLRWGSTALACGLVVVL SCILALNRATOKYITMLOLITAITTACLLVLPYMTSSFKDTPRFN 603LFLSVRCSVLVAISWSKRWHGVVLAIVPVFVAIDSLGLASEOLRWGSTALACGLVVVL SCILALNRATOKYITMLOLITAITTACLLVLPYMTSSFKDTPRFN 603LFLSVRCSVLVAISWSKRWHGVVLAIVPVFVAIDSLGLASEOLRWGSTALACGLVVVL SCILALNRATOKYITMLOLITAITTACLLVLPYMTSSFKDTPRFN 603LFLSVRCSVLVAISWSKRWHGVVLAIVPVFVAIDSLGLASEOLRWGSTALACGLVVVL SCILALNRATOKYITMLOLITAITTACLLVLPYMTSSFKDTPRFN 603LFLSVRCSVLVAISWSKRWHGVVLAIVPVFVAIDSLGLASEOLRWGSTALACGLVVVL SCILALNRATOKYITMLOLITAITTACLLVLPYMTSSFKDTPRFN 603LFLSVRCSVLVAISWSKRWHGVVL SCILALNRATOKYITMLOLITAITTACLL VLPYMTSSFKDTPRFN 603LFLSVRCSVLVAISWSKRWHGVVL SCILALNRATOKYN 603LFLSVRCSVLVAISWSKRWHGVVL SCILALNRATOKYN 603LFLSVRCSVL SCILALNRATO
                     YLSKEGMKWVSFIPTNOIYLLILIFIYSYITPKFIFFULFANVLA3IFFENFPNIPIIKWF VYLISKPLFTVBLSVASLVISS<mark>MOMFYKRŘOSD</mark>AANLAGLLKEYDMŤ-IDIEKTESOYSWNS LTPYFVKFIKOSDAANLAGILKEYDMŤ-IDIEKTESOYSWNS LTPYFVKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSADKKÝATVKKVÍMVSFSLLAILPLAVEGKSTATÚRÍMS V TORTO V 
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IX. Supplementary Figure S4

