**Additional file 10: Table S7.** **Comparison of host cell invasion-related protein phosphatases, kinases, and other signaling related proteins among *Toxoplasma gondii*, *Eimeria tenella*, and *Cyclospora cayetanensis*\***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | |  |  |
| **Domain family** | **Protein/gene ID** | ***T. gondii*** | ***E. tenella*** | ***C. cayetanensis*** |
| PP2C | PP2C-hn | PP2C-hn |  |  |
| PP2C-hn-like | SP+PP2C (10)\*\* | SP+PP2C (4) | SP+PP2C (1) |
| Rhoptry protein kinases | ROPK | SP/TM+Pkinase (14) | SP/TM+Pkinase (18) | SP/TM+Pkinase (7) |
| ROP2-like | SP/TM+Kinase\_like (27) | SP/TM+Kinase\_like (6) | SP/TM+Kinase\_like (1) |
| LMF1 | ROP14 | 11TM+LMF1 | SP+5TM+LMF1 | 8TM+LMF1 |
| ROP14B | 7TM+LMF1 |  | No domain\*\*\* |
| ROP48 | 9TM+LMF1 |  |  |
| ROP50 | 7TM+LMF1 | LMF1 | 3TM+2xLMF1 |
| Ion channel | Ion-channel | 4xKelch1+Kelch4+BTB2 | SP+2xKelch1+Kelch4 | 5xKelch1+Kelch4+BTB2 |
| Ion-channel | zf-CCCH+BTB2 | BTB2 |  |
| Ion-channel | SP+BTB2 |  |  |
| Ion-channel | 6TM+BK\_channel\_a+Ion\_trans\_2 | SP+2TM+Ion\_trans\_2 | 9TM+BK\_channel\_a+Ion\_trans\_2 |
| Ion-channel | SP+8TM+BK\_channel\_a+Ion\_trans\_2 |  | 2TM+BK\_channel\_a |
| Ion-channel | 6TM+Ion\_trans | 4TM | 6TM+Ion\_trans |
| Ion-channel | 3TM+Ion\_trans+Guanylate\_cyc | Guanylate\_cyc | 3TM+Ion\_trans+Guanylate\_cyc |
| Ion-channel | SP+10TM+Ion\_trans | 9TM+Ion\_trans | 9TM+Ion\_trans |
| Ion-channel | 20TM+4xIon\_trans | 19TM+3xIon\_trans | 21TM+4xIon\_trans |
| Ion-channel | 3TM+Ion\_trans | 3TM | 3TM |
| Ion-channel | TM+Ion\_trans+PDEase\_I |  |  |
| PPX1-like phosphatases | NTPase I | SP+GDA1\_CD39 |  |  |
| NTPase II | SP+GDA1\_CD39 |  |  |
| PPX1-like | SP+GDA1\_CD39 | SP+TM+GDA1\_CD39 | SP+TM+GDA1\_CD39 |
| PPX1-like | SP+2xGDA1\_CD39 | SP+GDA1\_CD39+Collagen | GDA1\_CD39 |
| PPX1-like | 2TM+2xGDA1\_CD39 | SP+TM | TM+2xGDA1\_CD39 |
| PPX1-like | SP+GDA1\_CD39 |  |  |
| PPX1-like | SP+TM+GDA1\_CD39 |  |  |
| PPX1-like | SP+GDA1\_CD39 |  |  |
| Serine protease inhibitor | TgPI-1 | SP+4xKazal\_1 |  |  |
| TgPI-2 | SP+3xKazal\_1 |  |  |
| TgPI-putative | SP+7xKazal\_1+6xKazal\_2 |  |  |
| TgPI-putative | SP+2xKazal\_1+Kazal\_2 |  |  |
| TgPI-putative | SP+Kazal\_1+Kazal\_2 |  |  |
| TgPI-putative |  | TM+Kazal\_1+Kazal\_2 |  |

* PP2C= Protein phosphatase 2C is a Mn++ or Mg++ dependent protein serine/threonine phosphatase. PP2C-hn, rhoptry protein that is secreted into host nucleus and may target phosphorylated host nuclear proteins. Other secreted PP2C proteins may similarly target host proteins. Only secretory PP2C-hn-like proteins with signal peptides are included in the table.
* Pkinase= Protein kinase domain, a structurally conserved protein domain containing the catalytic function of protein kinases.
* Kinase-like= Kinase-like proteins. This protein family includes the pseudokinases ROP2 and ROP8 from *T. gondii*. These proteins have a typical bilobe protein kinase fold, but lack catalytic activity.
* PH= Pleckstrin homology domain, involved in intracellular signaling or as constituents of the cytoskeleton.
* EDR1= Ethylene-responsive protein kinase Le-CTR1.
* LRR\_6= Leucine-rich repeat.
* LMF1= Lipase maturation factor. Lipoprotein lipase and hepatic lipase require LMF1 to fold into their active states.
* Kelch= Kelch motif.
* BTB2= Potassium channel tetramerization domain.
* Zf-CCCH= Zinc finger of the C-x8-C-x5-C-x3-H type (and similar sequences).
* BK\_channel\_a= BK channels (Big Potassium), also called Maxi-K or slo1, are potassium channels characterized by their large conductance of potassium ions (K+) through cell membranes.
* Ion\_trans= Transmembrane ion channel family is defined in InterPro and Pfam as the family of tetrameric sodium, potassium, and calcium ion channels.
* Guanylate\_cyc= Adenylate and Guanylate cyclase catalytic domain. K-channel+Cyclase+TPR, ancient alveolate specific protein. May regulate the “extrusosome” using ion flux and cyclic nucleotides.
* PDEase\_I= 3'5'-cyclic nucleotide phosphodiesterases (EC 3.1.4.17), cyclic 3',5'-mononucleotide phosphodiesterase, PDE.
* GDA1\_CD39= A number of nucleoside diphosphate and triphosphate hydrolases. Might catalyze the hydrolysis of extracellular nucleotides or phosphorylated small molecules and may affect host signaling.
* Collagen= Collagen helix.
* Kazal= Kazal-type serine protease inhibitor domain, usually indicative of serine protease inhibitors. However, kazal-like domains are also seen in the extracellular part of agrins, which are not known as protease inhibitors.

\*Most of the descriptions of the functional domains were based on search of the PFAM database 27.0 (March 2013) <http://pfam.xfam.org/>

\*\*Numbers in parentheses represent numbers of genes that contain the protein domains.

\*\*\*Cells with “No domain” represent that there is a lineage specific orthologous protein in this apicomplexan but with no functional domains.