**Supplemental Material include:**

**Supplementary Data S1.** Summary of DEGs between WT NF54 and *Pfsrpk1*⁻.

**Supplementary Data S2.** Gene ontology analysis of DEGs between WT NF54 and *Pfsrpk1*⁻.

**Supplementary Data S3.** Summary transcripts where splicing has changed in *Pfsrpk1*⁻ parasites compared to parental parasites WT NF54.

**Supplementary Data S4.** Gene ontology enrichment analysis of DEGs with altered splicing.

**Supplementary Figures S1-S4.**

**Supplementary Table 1.** Oligonucleotides used in the study.

**Supplementary Figures and Figure legends:**

Figure S1.

**Supplementary Figure S1. Disruption of the *PfSRPK1* locus via CRISPR/Cas9.** (A) The schematic shows the strategy for disrupting the *PfSRPK1* locus. pFC_SRPK1_KO plasmids has homology regions from 5’ (5’HR) and 3’ (3’HR) of *PfSRPK1* locus, single guide RNA seq (sgRNA) and human dihydrofolate reductase (hDHFR) locus and Cas9 cloned. (B) Confirmation of *PfSRPK1* deletion by diagnostic PCR. The oligonucleotides were designed from outside 5’HR and 3’HR and *PfSRPK1* locus and positions are
indicated by arrows in (A). (C) The expected sizes of amplicons for different set of PCRs performed in (B) are indicated. (D) IFAs were performed on Pfsrpk1− asexual stages (trophozoite) using thin smears using anti-PfSRPK1 antisera (in green) in combination with anti-PfCDPK4 (in red). PfSRPK1 staining was negative for Pfsrpk1−. (E) Light microscopy of Giemsa-stained thin smears for the development of WT PfNF54 and Pfsrpk1− schizont stages showing daughter merozoites. 1,000×magnification. Representative Giemsa-stained images of WT PfNF54 and Pfsrpk1− schizonts which were used for quantitative assessment of daughter merozoite numbers (in Fig. 2B) are shown. (F) WT PfNF54 and Pfsrpk1− parasites were tested for their potential to form gametocytes. Light microscopy of Giemsa-stained thin smears showing development of WT PfNF54 and Pfsrpk1− gametocytes and the four (II-V) distinct morphological stages. 1,000×magnification. Symbols for male and female gametocytes are shown on top of stage V gametocytes. Representative Giemsa-stained images of WT PfNF54 and Pfsrpk1− gametocytes including stage V gametocytes which were used for quantitative assessment (in Fig. 2D) are shown.
Supplementary Figure S2. Disruption of PfSRPK1 results in altered transcription of genes encoded by multi-gene families associated with heterochromatin. Violin plot showing heterochromatin associated gene families with significant dysregulation in PfSrpk1−. Geometric mean fold-changes and p-values (two-sided, one sample t-test) are indicated.
Supplementary Figure S3. Disruption of PfSRPK1 results in dysregulation of splicing. (A) Biological process, (B) Cellular component, and (C) Molecular function gene ontology terms of the transcripts with altered splicing patterns are provided that highlight key biological processes that are impacted by PfSRPK1 deletion. Log2(p values) are indicated on x-axis for all the categories.
Supplementary Figure S4. Expression and localization of PfsSRPK1 and PfMAP2 and altered transcription of genes encoding fatty acid metabolism in Pfsrpk1−. (A) IFAs were performed on WT PjfNF54 stage V gametocytes using thin smears using anti-PfsSRPK1 antisera (in green) in combination with anti-PfMAP2 (in red) to show coinciding expression. (B) Heatmaps showing DEGs encoding fatty acid metabolism enzymes in Pfsrpk1− gametocytes. Scale bar indicates Log2 fold change of TPM values of the samples in expression. Scale bar indicates Log2 fold change of TPM values of the samples in expression.
Supplementary Table 1. Oligonucleotides used in the study.

| Oligonucleotides used for generation of *Pf*srpk1− parasites | Forward (5’-3’) |
|-------------------------------------------------------------|-----------------|
| PfSRPK1 5’Homo For                                         | TGCGGCGCGTAAAAACTAGCGAAAAAGAAAAAAATGAGAAATAG |
| PfSRPK1 5’Homo Rev                                         | CCAACCCGGGTATAGGCACGCTTTATATATTTATATAAAAATT TGAGATTATATCCTG |
| PfSRPK1 3’Homo For                                         | AGGCCGCCTATACCCGGGTTGGTAGAATATATTATATATAGTC AAAATTTGCAAAAAAA |
| PfSRPK1 3’Homo Rev                                         | TAAAGTGACGACGTTGATTATAAAAAGTAGATATATCGTTGTTTC |
| PfSRPK1 Guide 1 For                                         | TATTAGTAGTGAAAGATGCTACTTC |
| PfSRPK1 Guide 1 Rev                                         | AAACGAAGTAGCATCTCACTACT |
| PfSRPK1 Guide 2 For                                         | TATTGGCCTATTTAATGGTTTGTCT |
| PfSRPK1 Guide 2 Rev                                         | AAACAGACAAACCATTAAATGACGC |
| PfSRPK1 Geno5 For                                           | TGAAGACAAACAAATTTGGTTTATATACAGTTG |
| PfSRPK1 Geno5 Rev                                           | TCCCTCAGTAGTATCATCACTTCC |
| PfSRPK1 Geno3 For                                           | CAAAAAATGCAATATCAGAAAAAAACAAAC |
| PfSRPK1 Geno3 Rev                                           | CCAATTTGTAGCTTTATTTTCAGTATTATGC |