## Far-East Asian Toxoplasma isolates share ancestry with North and South/Central American recombinant lineages.

Toxoplasma gondii is a global protozoan pathogen. Clonal lineages predominate in Europe, North America, Africa, and China, whereas highly recombinant parasites are endemic in South/Central America. Far East Asian T. gondii isolates are not included in current global population genetic structure analyses at WGS resolution. Here, we report a genome-wide population study that compared eight Japanese and two Chinese isolates against representative worldwide T. gondii genomes using POPSICLE, a novel population structure analyzing software. Also included were seven genomes resurrected from non-viable isolates by target enrichment sequencing. Visualization of the genome structure by POPSICLE shows a mixture of Chinese haplogroup (HG) 13 haploblocks introgressed within the genomes of Japanese HG2 and North American HG12.

Furthermore, two ancestral lineages were identified in the Japanese strains; one lineage shares a common ancestor with HG11 found in both Japanese strains and North American HG12. The other ancestral lineage, found in T. gondii isolates from a small island in Japan, is admixed with genetically diversified South/Central American strains. Taken together, this study suggests multiple ancestral links between Far East Asian and American T. gondii strains and provides insight into the transmission history of this cosmopolitan organism.



**Journal:** *Nature Communications* (online May 22, 2024)

**Title:** "Far-East Asian Toxoplasma isolates share ancestry with North and South/Central American recombinant lineages."

Ihara et al. Nature Communications (2024)

Authors: Fumiaki Ihara, Hisako Kyan, Yasuhiro Takashima, Fumiko Ono, Kei Hayashi, Tomohide Matsuo, Makoto Igarashi, Yoshifumi Nishikawa, Kenji Hikosaka, Hirokazu Sakamoto, Shota Nakamura, Daisuke Motooka, Kiyoshi Yamauchi, Madoka Ichikawa-Seki, Shinya Fukumoto, Motoki Sasaki, Hiromi Ikadai, Kodai Kusakisako, Yuma Ohari, Ayako Yoshida, Miwa Sasai, Michael E. Grigg, and Masahiro Yamamoto

DOI: https://doi.org/10.1038/s41467-024-47625-6