# Cerebral Malaria Causal Path - DIY

Using bioinformatics supported by quantum biology (QB), the following NIH document concerning cerebral malaria and Cytotoxic T Lymphocytes was subjected to scrutiny with the findings summarized in this document for review and verification by qualified computational biologists.
https://www.nih.gov/news-events/news-releases/nih-study-supports-new-approach-treating-cerebral-malaria

For use as part of a DIY exercise, the QB findings included the following:

- Cytotoxic T Cells (CTCs) are an alternative designation for Cytotoxic T Lymphocytes (CTLs).
- CTLA 4 is one of the Granzymes with an alternative designation (CTLA4 v Granzyme-D

**Lysosome-based Cellular Defenses**

| CTLA | Granzyme Equivalents | Function/Role |
|---|---|---|
| 1 - 2 - 3 | A - B - C | Transferrins (1) |
| 4 | D | Mitophagy (2) |
| 5 - 6 -7 | E - F - G | Autophagy (3) |

- CTCs and CTLs both encompass CD4 and CD8 cells
- CTCs and CTLs both encompass Th1 and Th2 cell
- Th17 and CD25 are both encompasses in CTCs and CTLs
- Th17 and CD25 can both be verified as epigenetic markers for mitophagy performed by CTLA4.

The following QB modeling tool is provided for discussions concerning CTCs, CTLs and mitophagy relative to cerebral malaria.

## Alignment of Molecules: For Explanation , Discussion and DIY Exercise

**TNF-Alpha: TGF- Alpha: VEGF-A (Calnexin) Density (Th1 and CD-4)**

Calcium – threonine – magnesium (BRCA1) **p16**
Calcium – serine – magnesium (BRCA2) **p18**
Calcium – cysteine - magnesium (BRCA3) **p19**

**TNF-Beta: TGF-Beta: VEGF-B (Calmodulin) Motility (Th2 and CD-8)**

Calcium – phenylalanine – magnesium (HRas) **p21**
Calcium – tyrosine – magnesium (KRas) **p27**
Calcium – tryptophan – magnesium (NRas) **p57**

**TNF-Gamma: TGF-Gamma: VEGF-C (Calcineurin) Modulatory Enzyme: IFNγ and (Th17 cells and CD-25)**

Iron – serine – Manganese
Iron – cysteine – Manganese
Iron – threonine – Manganese

**Numerous alternative designations for calcineurin have evolved due to the lack of an explicit model such as Quantum Biology. One such designation is MYC that, like calcineurin, also has 3 forms; L-MYC, N-MYC and C-MYC**