

High osteopontin(OPN) response against plasmodium falciparum in Thailand- Myanmar border

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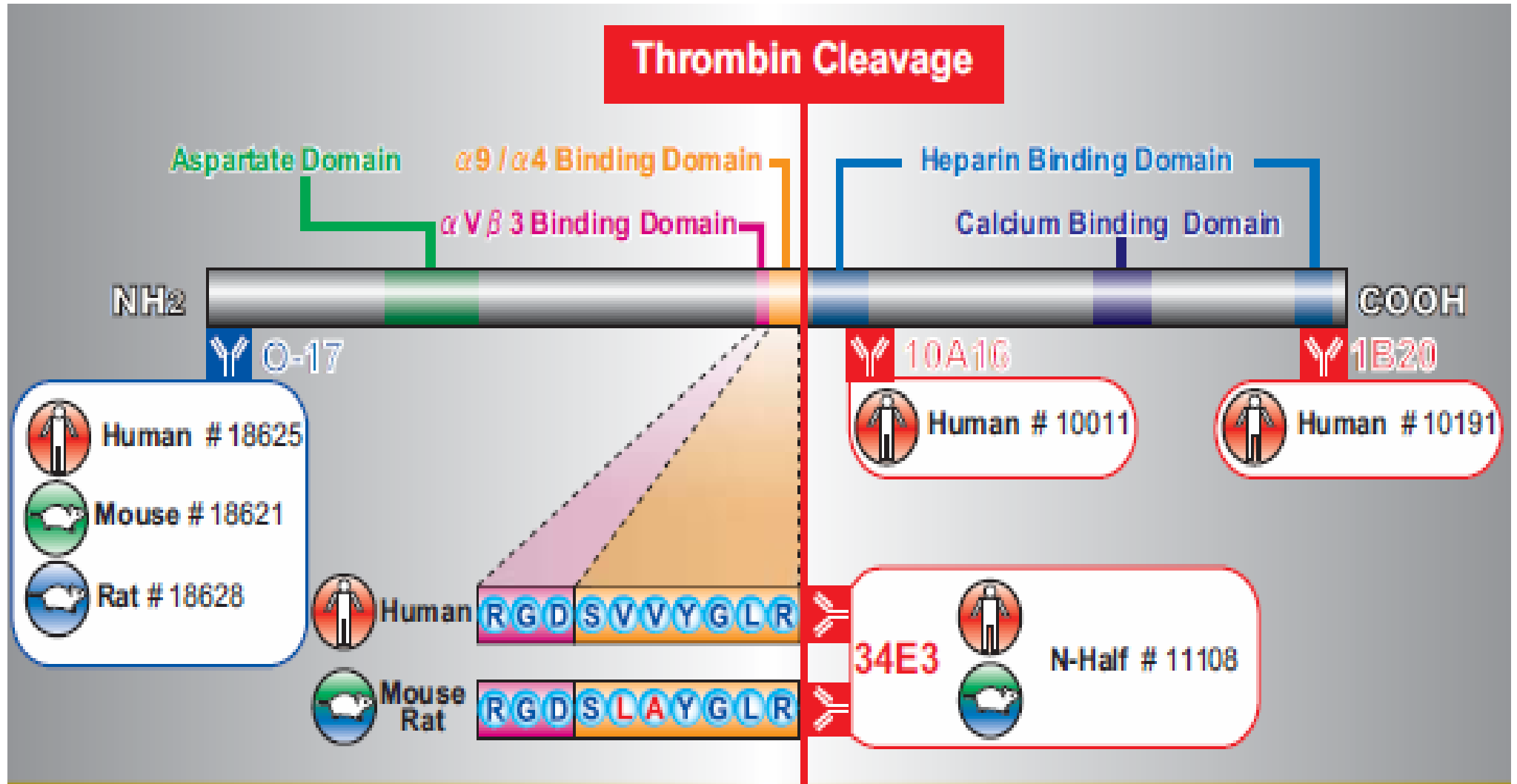
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- **Secreted phosphoprotein 1 (osteopontin, bone sialoprotein I, early T-lymphocyte activation 1), also known as SPP1 and commonly referred to as osteopontin**
- **Osteopontin is biosynthesized by a variety of tissue types including , osteoblasts, osteocytes, extraosseous cells in the inner ear, brain, kidney, deciduum, placenta, odontoblasts, some bone marrow cells, hypertrophic chondrocytes, macrophages, smooth muscle, and endothelial cell.**

Overexpressed

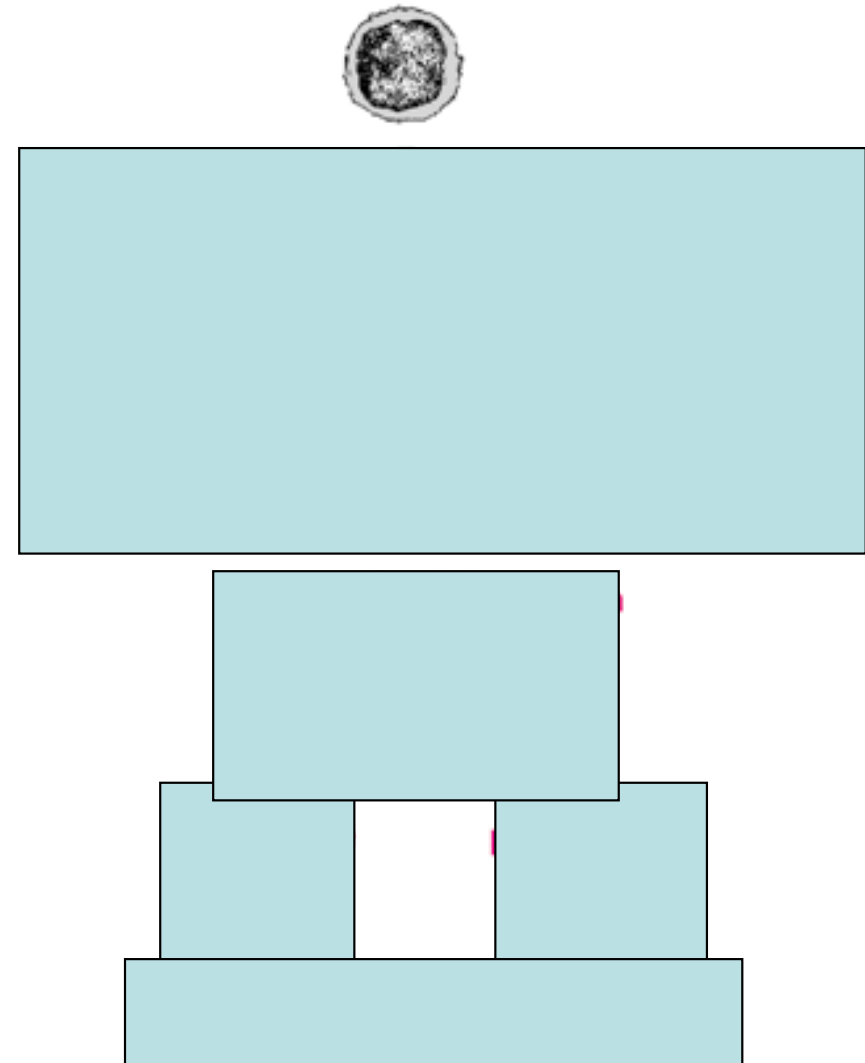
- A variety of cancers
- Kidney disease
- Autoimmune disease
- Atherosclerosis
- Infectious diseases such as HIV, MTB and malaria

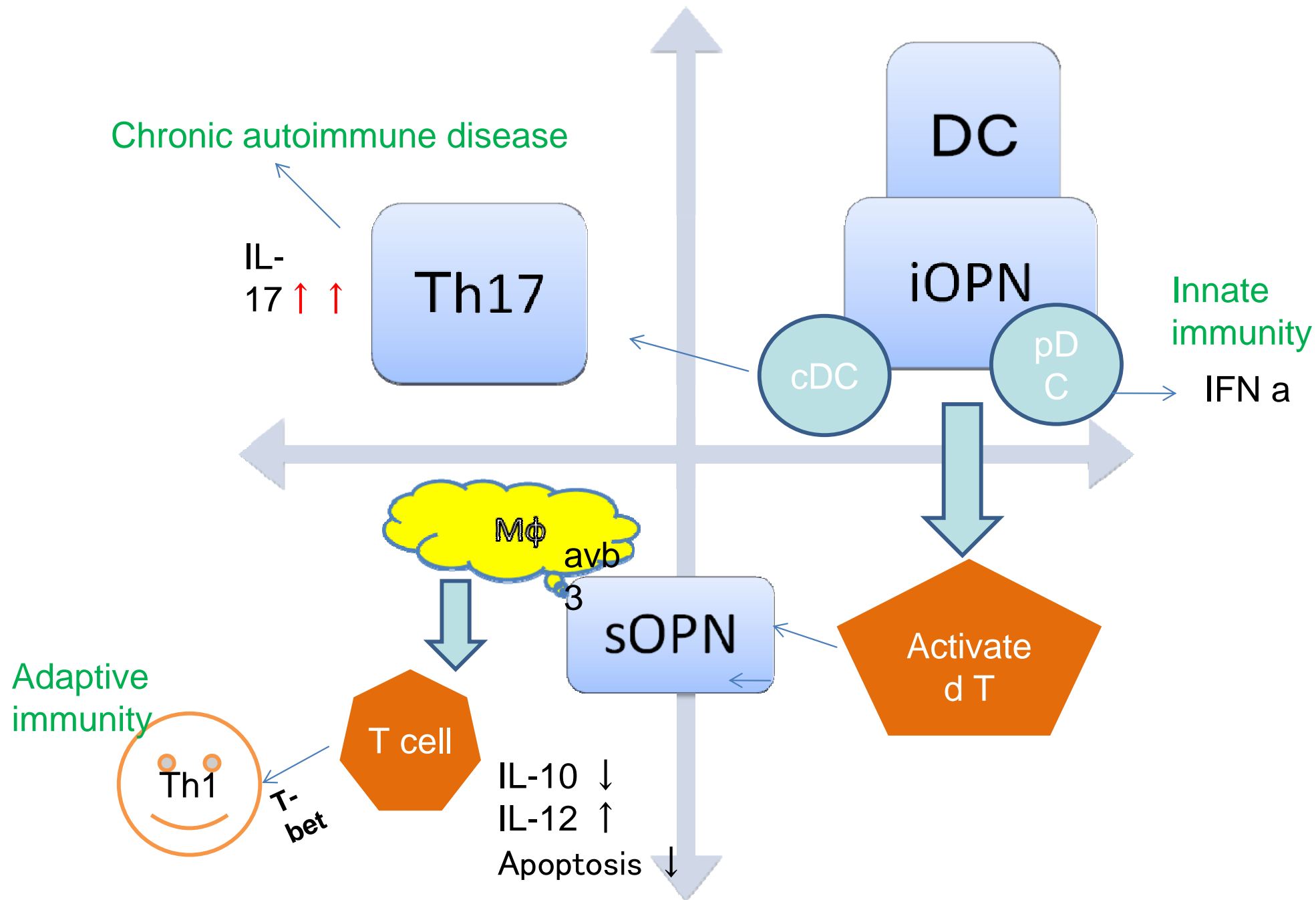
Structure of OPN



Receptors for OPN

- CD44 family and integrin family (αvβ3, αvβ5, αvβ1, α1β1, α8β1, α9β1)
- Stimulates cell adhesion migration, and specific signaling functions.
- N-terminal portion of Eta and its integrin receptor stimulated IL-12 express
- Interaction with CD44 inhibited IL-10 expressio





OPN on Malaria

- In OPN-knock out mice it was revealed that murine malaria parasite *P.chabaudi* induce OPN production and that OPN is involved in the clearance of the malaria parasites through Th1 immune responses at an early stage of *P.chabudi* infection.

Purpose

- Clarify the role of osteopontin in malarial infection in human.
 - Is OPN level high in malaria patients?
 - Is the level related with malaria exposure time?
 - Is the level related with malaria clinical symptoms?
 - Does the level associate with other laboratory markers?
 - Dose the level decrease after therapy

Methods

- We analyzed 17 falciparum malaria cases from the Thailand-Myanmar border area in Tak province.
- The OPN levels were measured by an enzyme linked immuno assay using whole blood which were collected at day 0,2,7,14,21,28. Whole blood of normal volunteers were used as control.
- The levels of OPN and other clinical laboratory markers were compared between low exposure (LE) ;2 or less and high exposure (HE);3 or more.

Characteristic of study group

Characteristic	Case (n=17)	LE case (n=9)	HE case (n=8)
Female	0	0	0
Male	17	9	8
Age(mean year)	27	25	30
Splenomegaly (%)	1/17 (5)	1/9 (11)	0
Hepatomegaly (%)	16/17(84)	9/9 (100)	7/8 (86)
Fever (%)	14/17 (74)	8/9 (89)	4/8 (50)
FCT (hour)	34	34	33.7
PCT (hour)	44	47.5	39.1

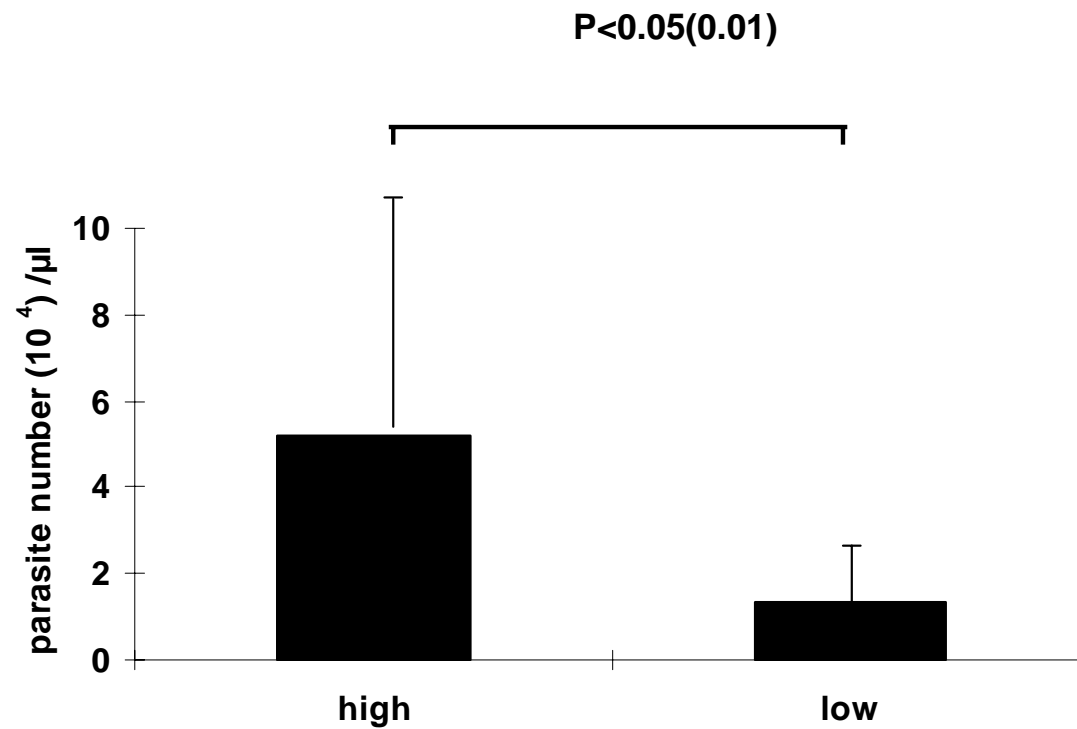
Laboratory markers

Characteristic	Case (n=17)	LE case (n=9)	HE case (n=8)
Hemoglobin (g/dl)	12.6	12.3	13
Hematocrit (%)	37.5	36.5	38.3
WBC (10 ⁶ /L)	5160	5240	4888
Monocyte (10 ⁶ /L)	337	385	321
Lymphocyte (10 ⁶ /L)	1194	1271	1195
Eosinophil (10 ⁶ /L)	247	225	303
Neutrophil (10 ⁶ /L)	3317	3346	3028
Malarial density (µl)	32588	46712	14528
Pletlet (10 ⁹ /L)	134	152.4	115.5
SGPT (U/L)	22.6	30	17
ALP (U/L)	95.1	112.8	84
OPN (ng/ml)	334.3	448.25	232.01
High OPN case (%)	5/17 (26)	4/9 (44)	1/8/(12.5)

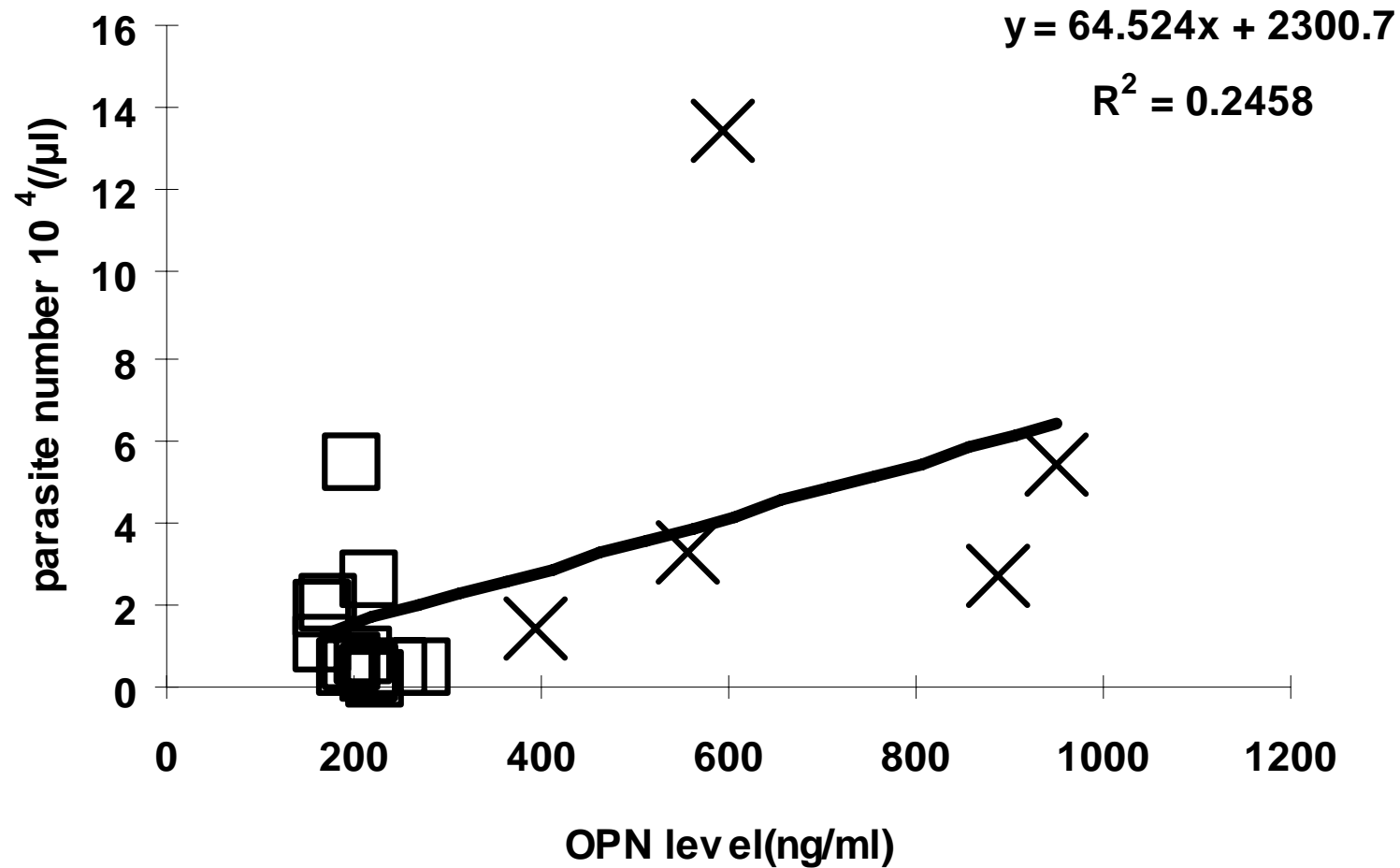
Characteristic	Case (n=17)	high OPN case(n=5)	low OPN case(n=12)
Age(mean year)	27	22	30
Splenomegaly (%)	1/17 (5)	1/5 (20)	0
Hepatomegaly (%)	16/17 (84)	5/5 (100)	11/12 (92)
Fever (%)	14/17 (74)	4/5 (80)	6/12 (50)
FCT (hour)	34	25.6	38.1
PCT (hour)	44	52.8	49.5
Hemoglobin (g/dl)	12.6	12.2	12.5
Hematocrit (%)	37.5	36.8	37.4
WBC (10 ⁶ /L)	5160	5000	5193
Monocyte (10 ⁶ /L)	337	316	317
Lymphocyte (10 ⁶ /L)	1194	1178	1254
Eosinophil (10 ⁶ /L)	247	148	320.5
Neutrophil (10 ⁶ /L)	3317	2877	3324
Malarial density (/μl)*	32588	52226	13171
Pletlet (10 ⁹ /L)	134	103.2	159.1
SGPT (U/L)	22.6	17	25
ALP (U/L)	95.1	106.4	90.4
OPN (ng/ml)	334.3	641.7	198.3

* : P<0.05

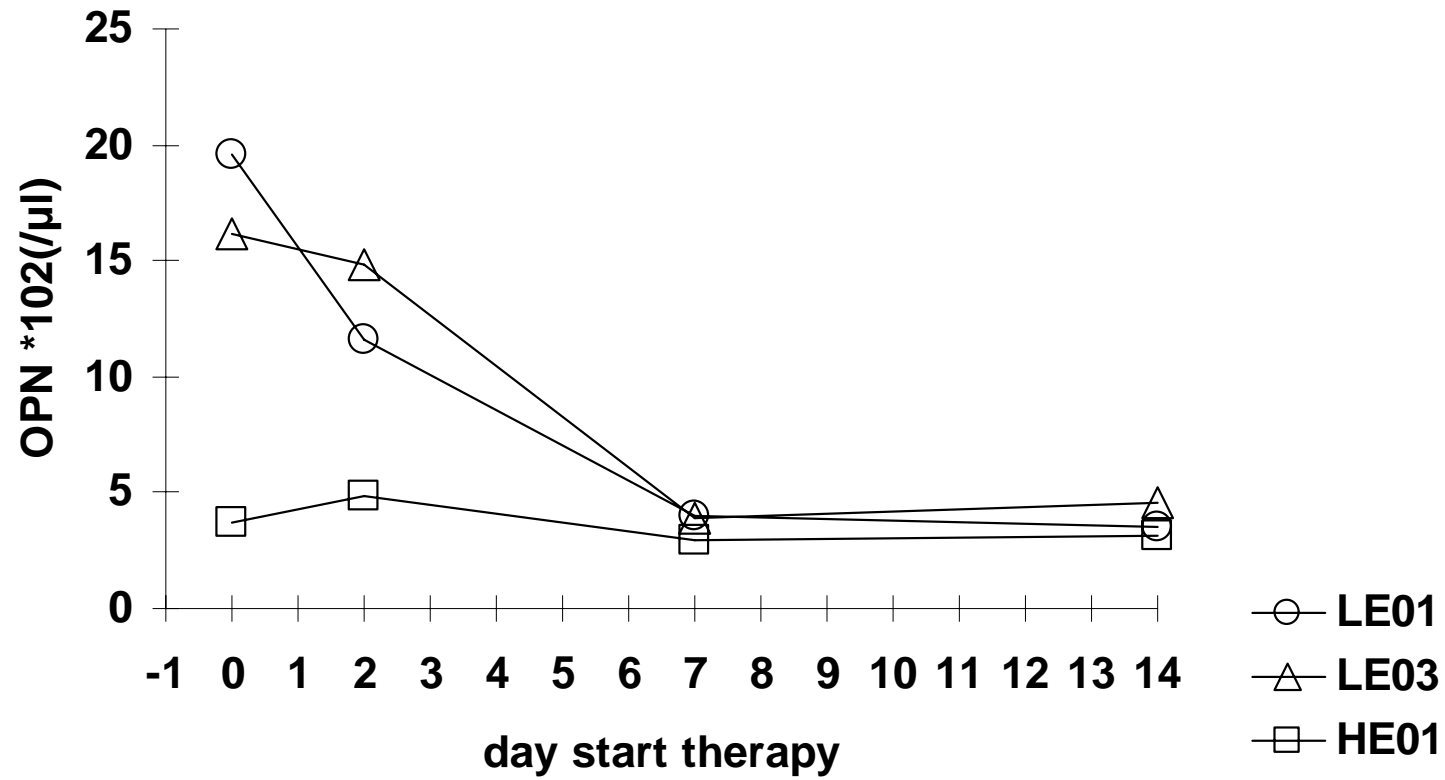
The parasite numbers of patients with high and low OPN levels.



Correlations of OPN level with parasite numbers.



Time dependent decrease of the OPN levels by therapy.



Conclusion

- Five of 17 malaria patients showed high OPN level
- None of patients develop complication and the OPN level decrease after therapy
- The OPN level is significantly correlated with parasite density
- High OPN level in LE group may indicated Th1 response against malaria infection in human.

Further studies of OPN in malaria infection would help us clarify the role of OPN in protection against malaria .

Acknowledgement

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- thanks for every authors and well collaboration
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