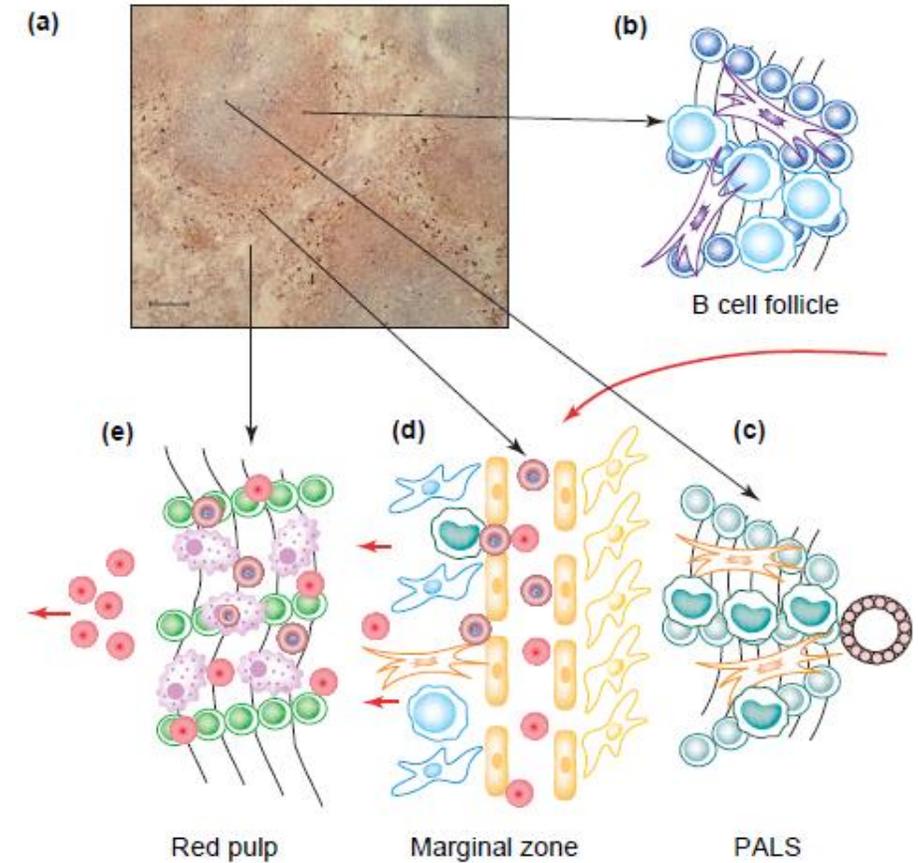
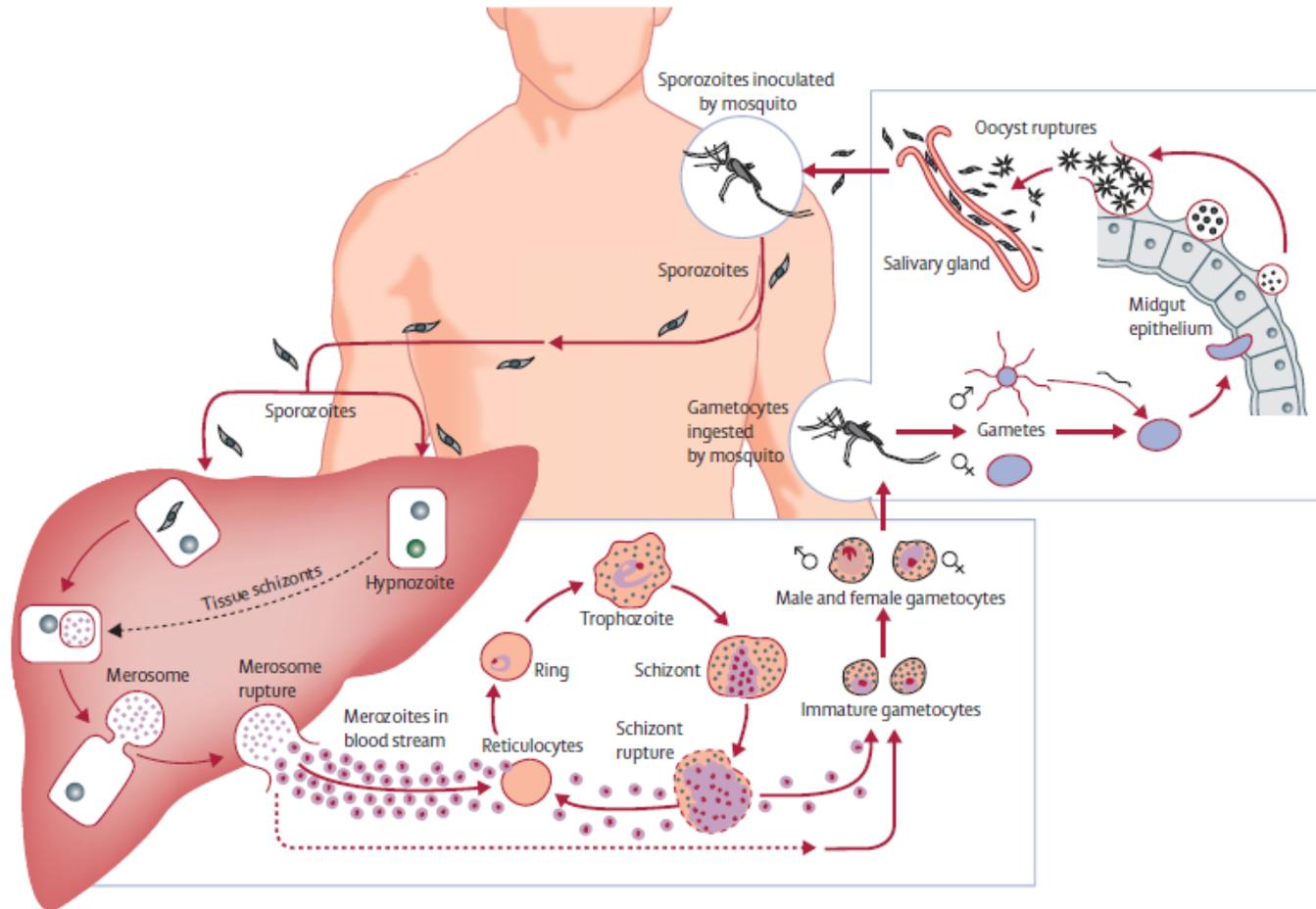
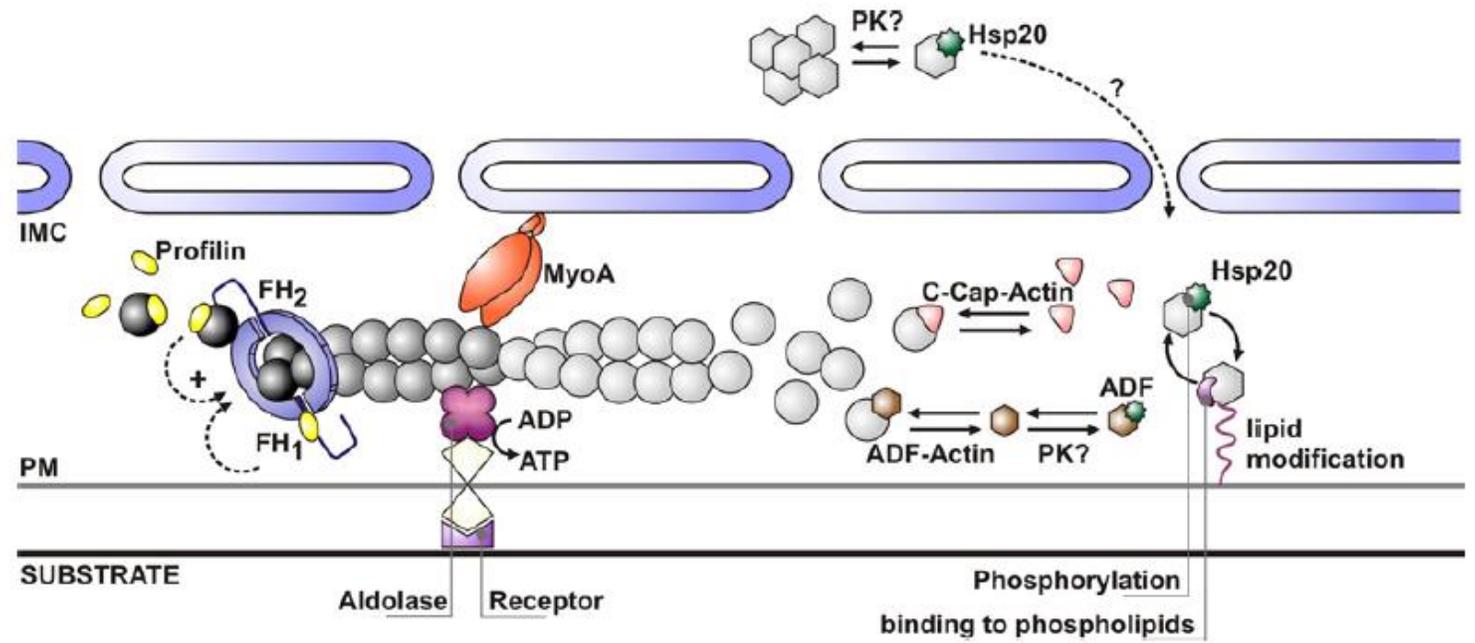
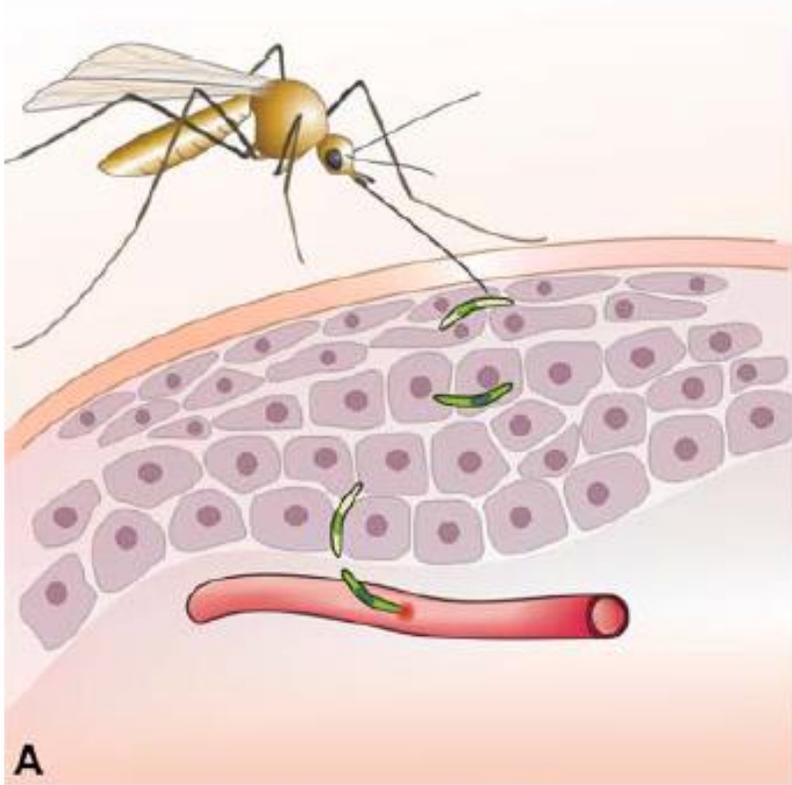


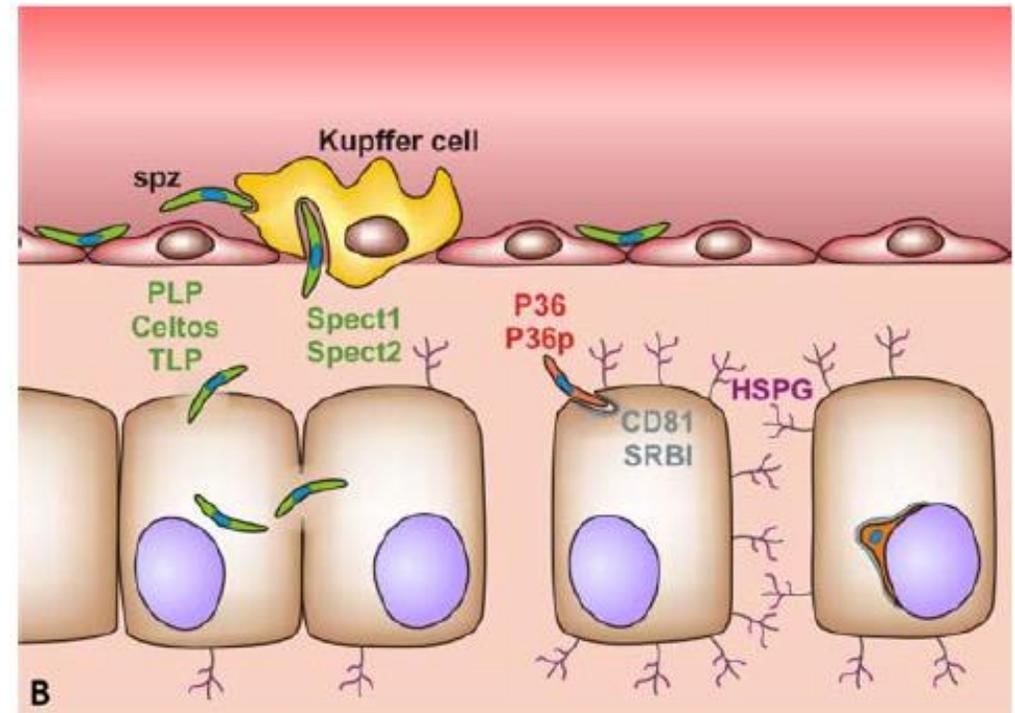
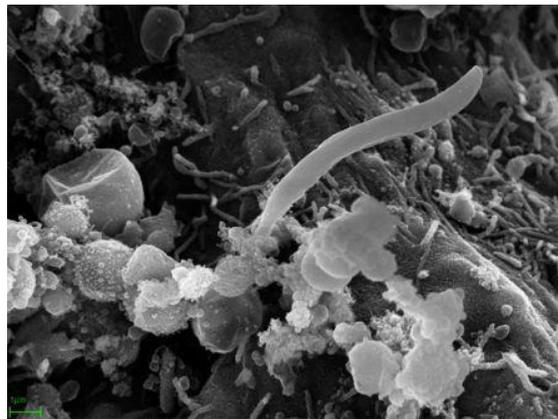
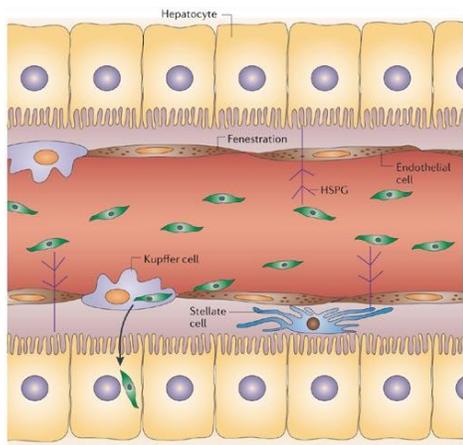
Паразитизм: мир в другом измерении

Зоология беспозвоночных, 2015
Гранович А.И., Мальцева А.Л., Крапивин В.А.

Человек – сложная среда для обитания

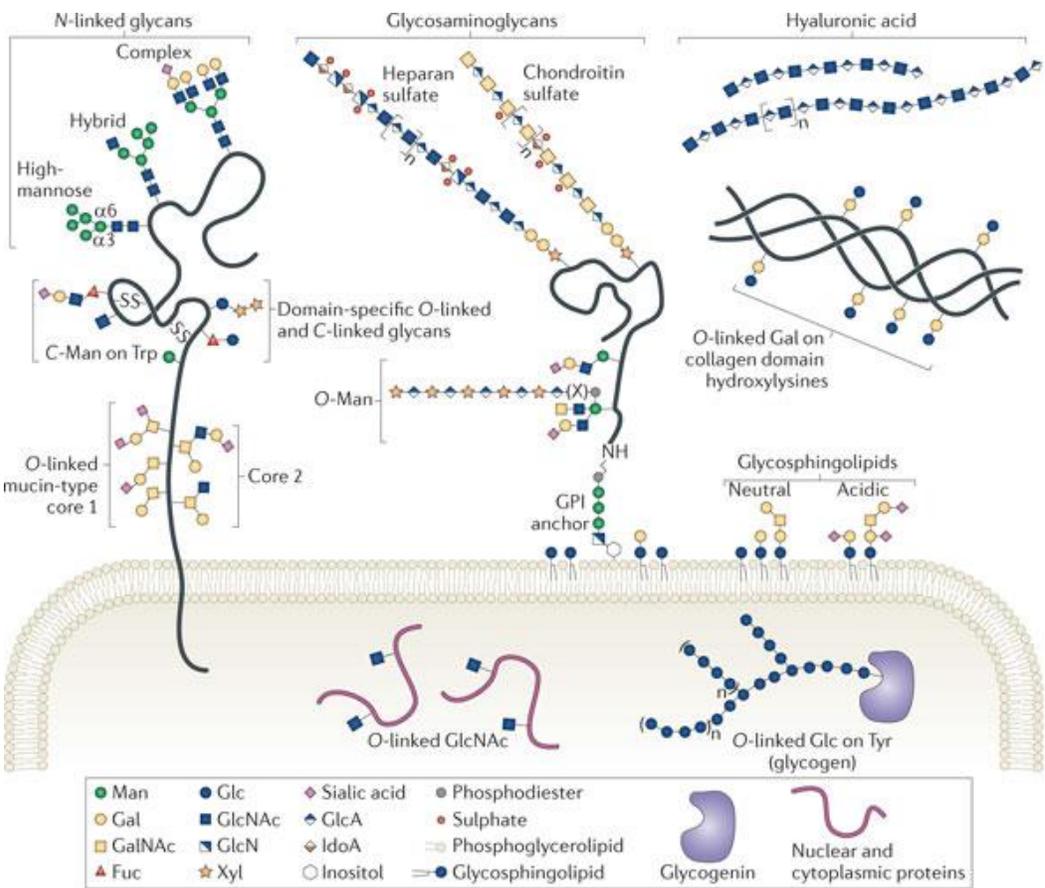
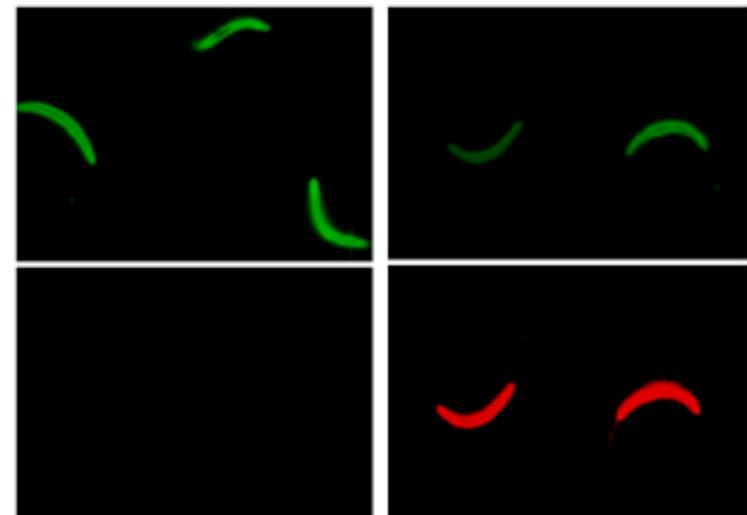


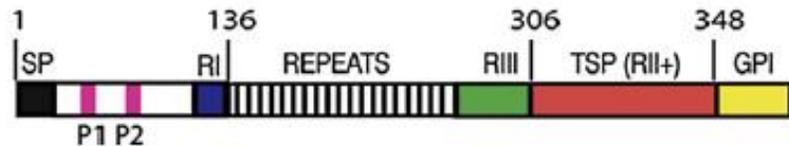




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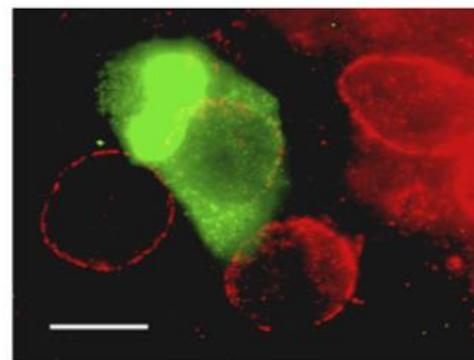
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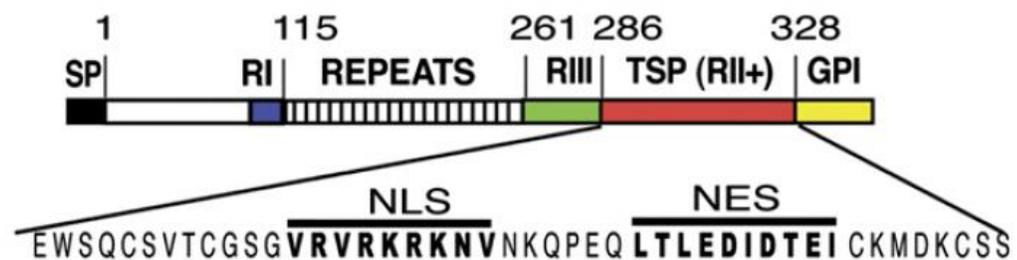
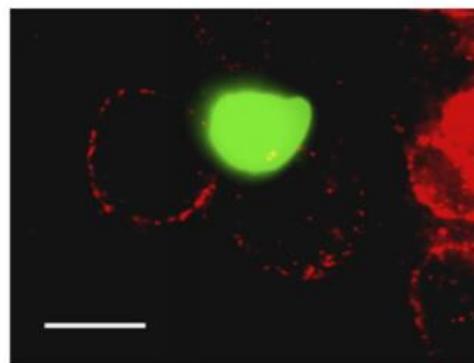


	Signal sequence	Pexel I	Pexel II	
<i>P. yoelii</i>	1 MKKCTILVWASLLLVDSLLPGYGQNKSVQAQ	RNLNELCYNEEND---NKLYHVLNSKNGKIYNRNIVN	RLLGD AING	74
<i>P. berghei</i>	1 MKKCTILVWASLLLVNSLLPGYGQNKIIQAQ	RNLNELCYNEGND---NKLYHVLNSKNGKIYNRNTVN	RLLAD APEG	74
<i>P. falciparum</i>	1 MRKLAILSVSFFLVEALFQEQYQCYGSSSNT	RVLNELNLDNAGINLYNELEMNYYGKQENWYSLKKN	RSLGE NDDG	77
<i>P. reichenowi</i>	1 MRKLAILSWSFFLVEALFQEQYQCYGSSSNT	RVLNELNLDNAGTNLYNELEMNYYGKQENWYSLKKN	RSLGE NDDA	77
<i>P. malariae</i>	1 MKKLSVLAISSFLIVDFLFPGYHHNSNSTKS	RNLSELNLDNAGTNLYNELEMNYYGKQENWYSLKKN	RLLNE NNNE	77
<i>P. gallinaceum</i>	1 MKKLAILSASSFLPADFLFQEQYQHNGNYKNP	RLLNEVCYNNMNIQLYNELEMENYMSNTYFYNNKTI	RLLGE NDNE	77
<i>P. vivax</i>	1 MKNFILLAVSSILLVDFLFPNCGHNVVDSKAINLNGVFNNDVDA	-----SSLGAAHVGQSASRG	RGLGE NPDD	68
<i>P. cynomolgi</i>	1 MKNFNLLVWSSILLVDFLFPNCGHNVVDSKAINLNGVFNNDVDA	-----SSLGAAQVRQSASRG	RGLGE NPKD	68
<i>P. simium</i>	1 MKNFILLAVSSILLVDFLFPNCGHNVVDSKAINLNGVFNNDVDA	-----SSLGAAHVGQSASRG	RGLGE NPDD	68
<i>P. ovale</i>	1 MKNFILLAVSSILLVDFLFPNCGHNVVDSKAINLNGVFNNDVDA	-----SSLGARQVRQSASRG	RGLGE NPKD	68
<i>P. knowlesi</i>	1 MKNFILLAVSSILLVDLLPHTFHNVDLSRAINLVNGVFNNDVDT	-----SSLGAAQVRQSASRG	RGLGE KPKE	68

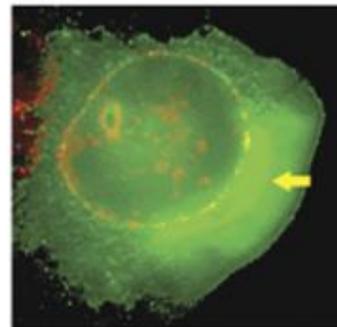
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2 hr
EEF



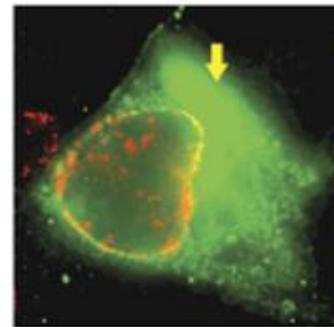
P1-2
Mut
2 hr
EEF



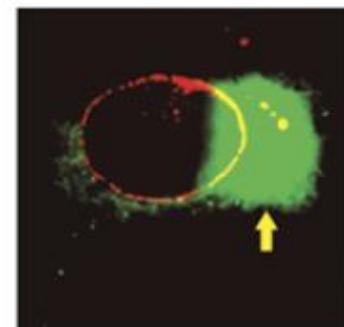
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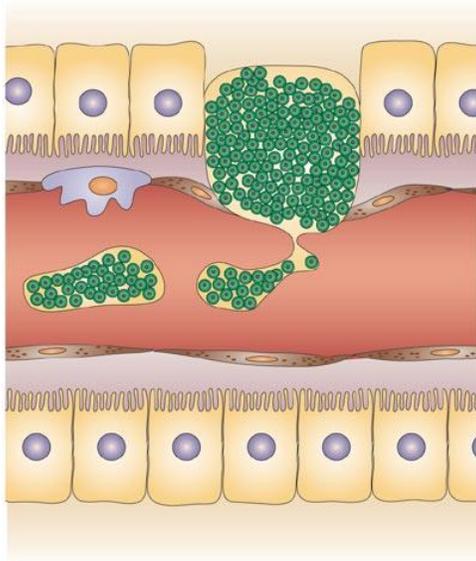
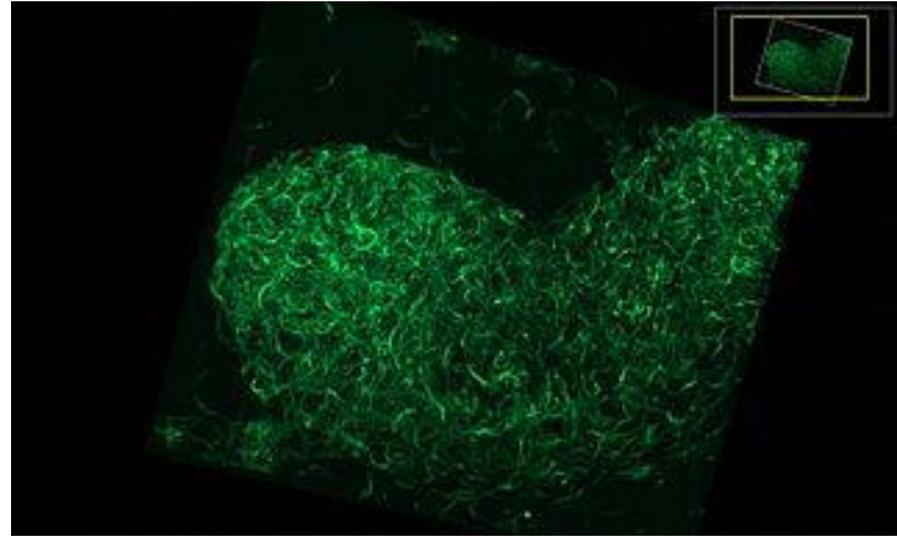
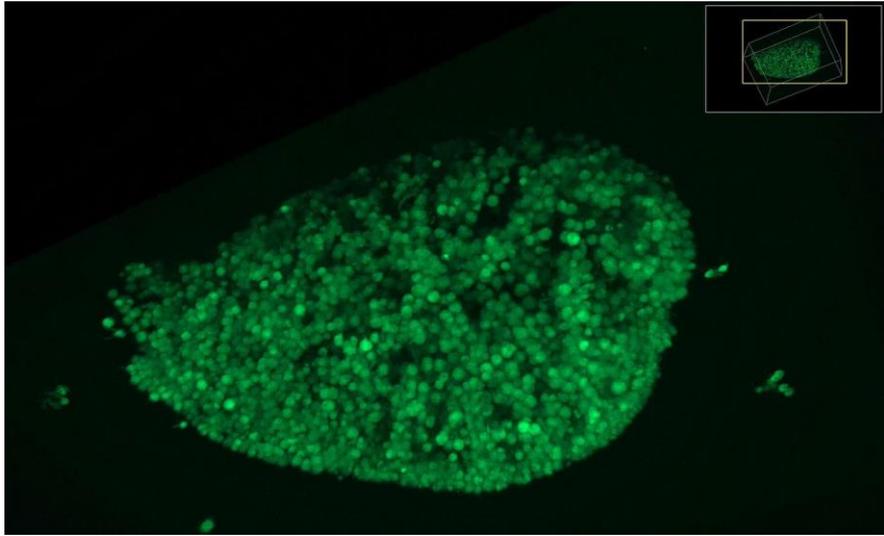


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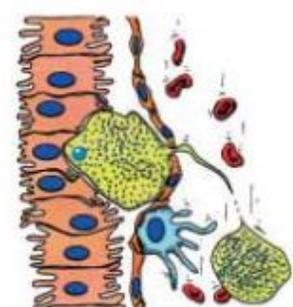
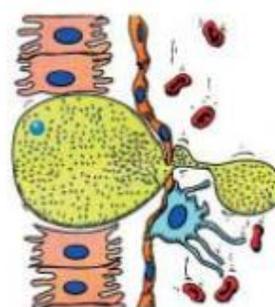
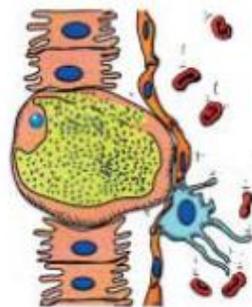
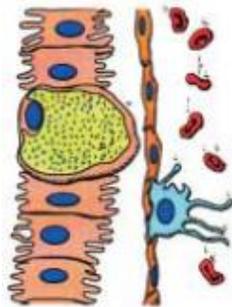
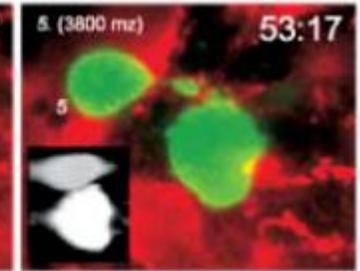
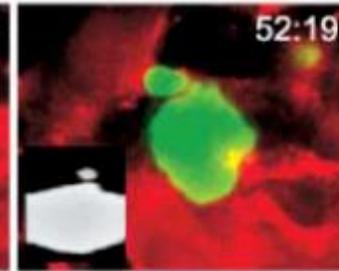
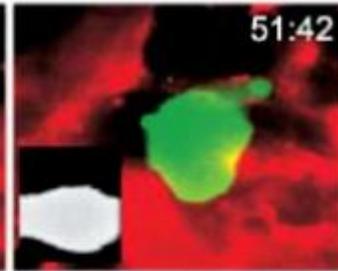
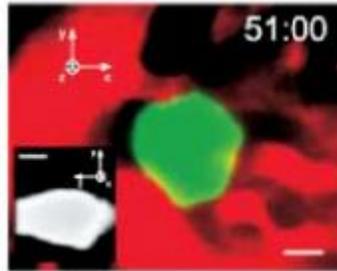


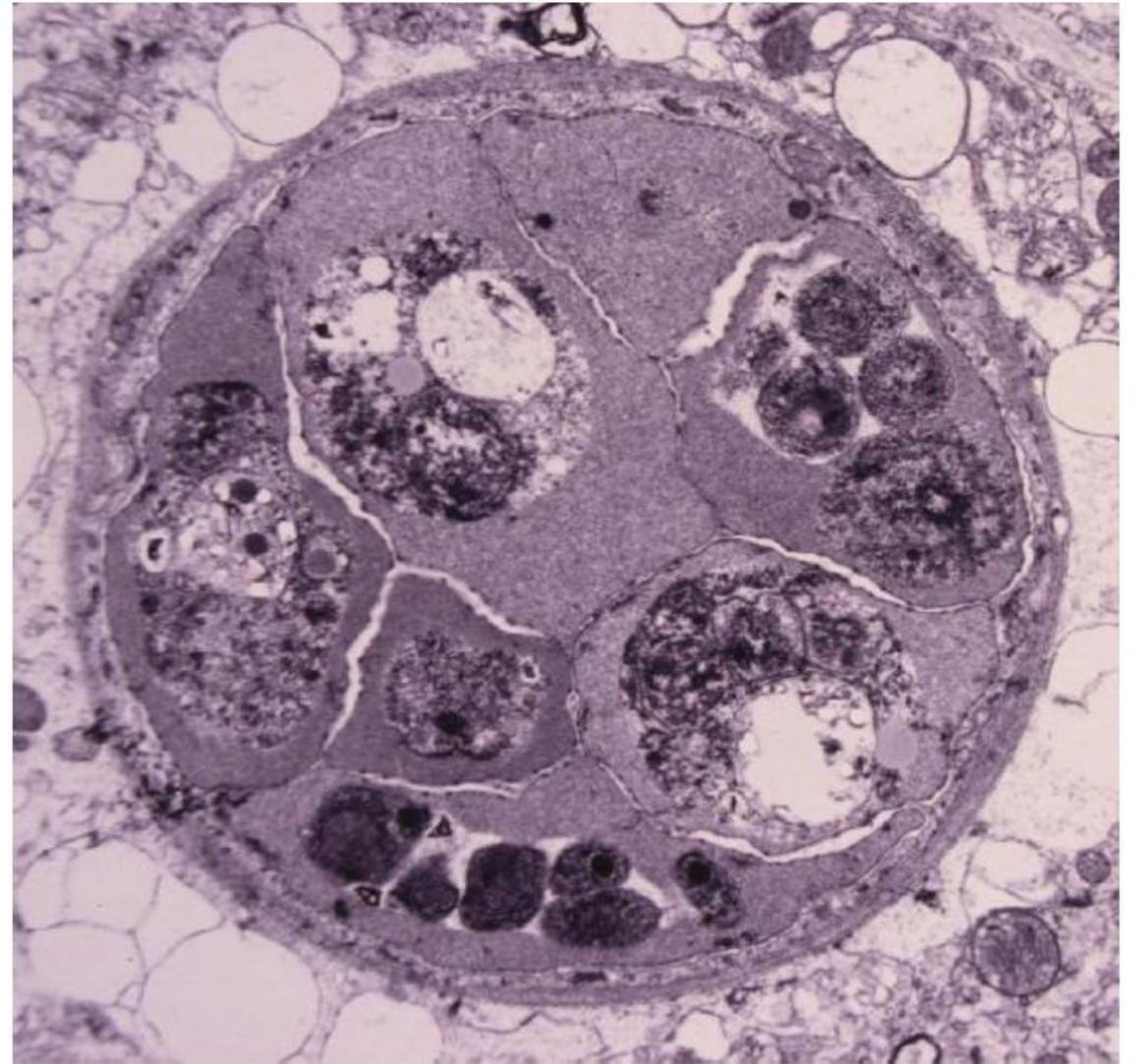
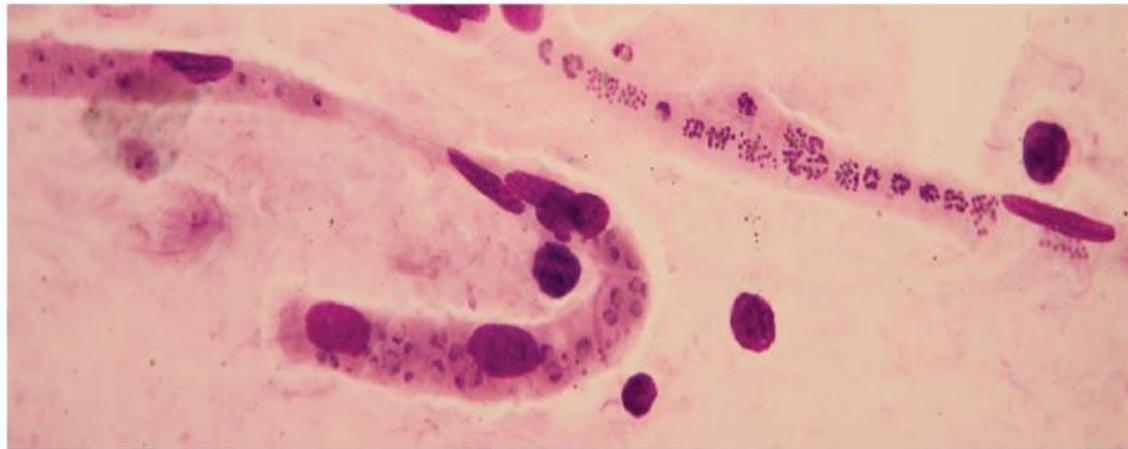
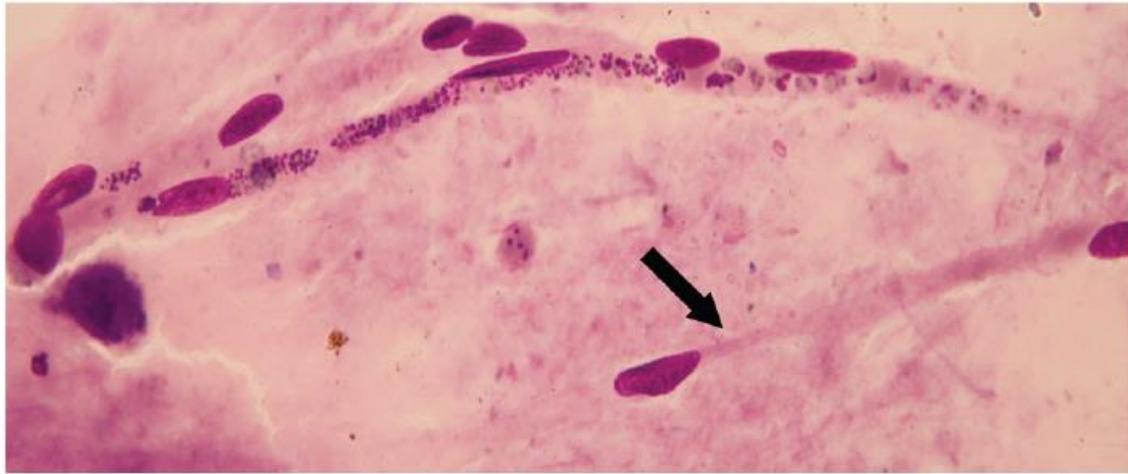
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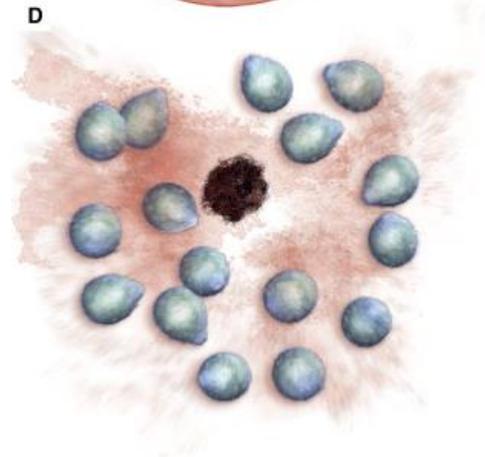
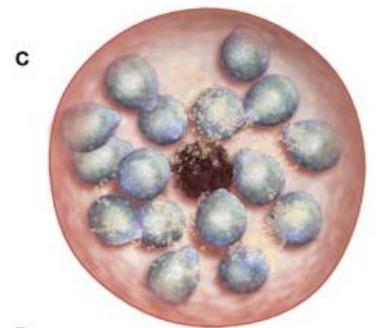
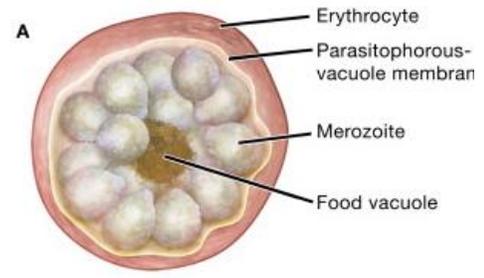
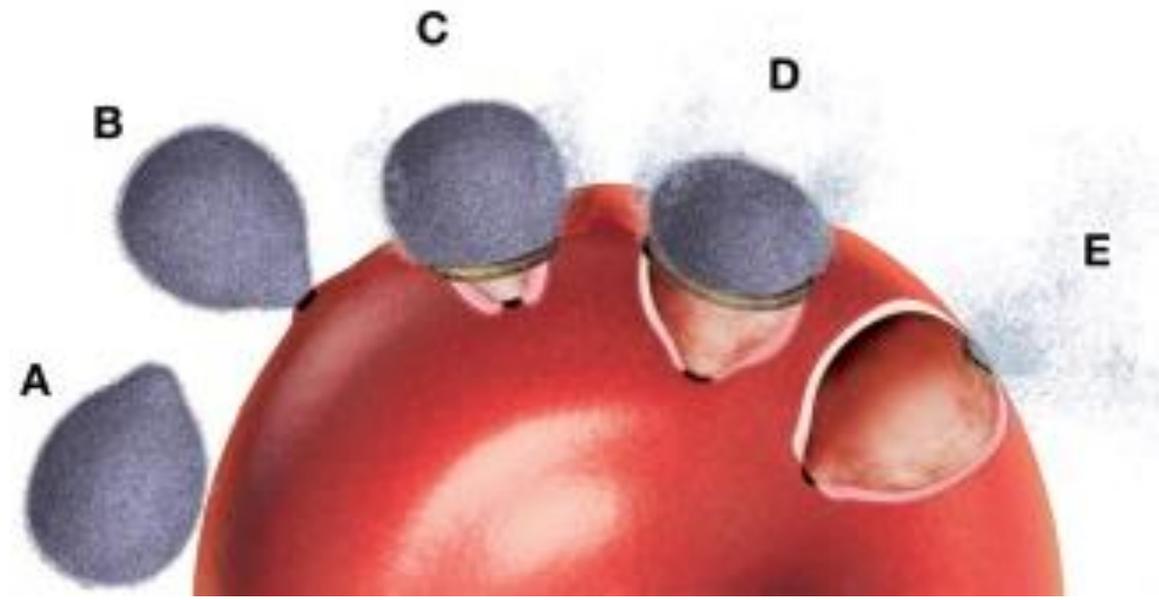
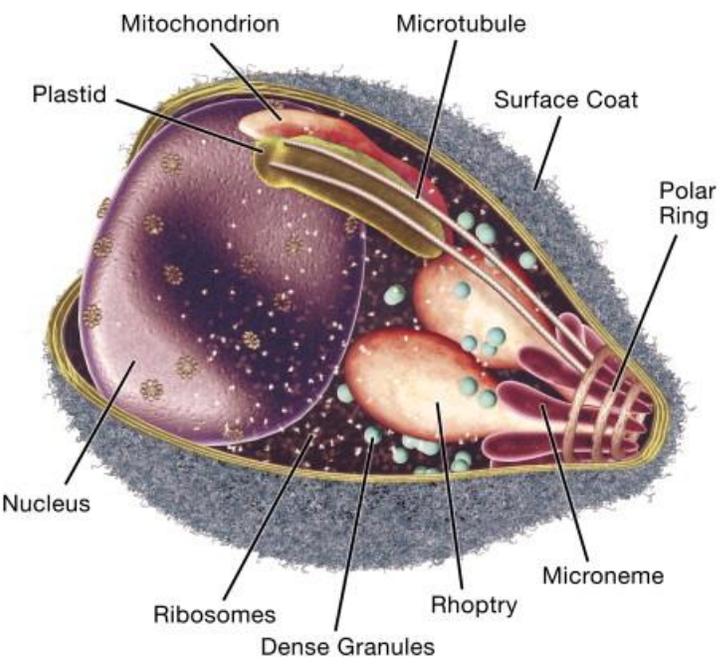




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Attachment

Apical Re-orientation

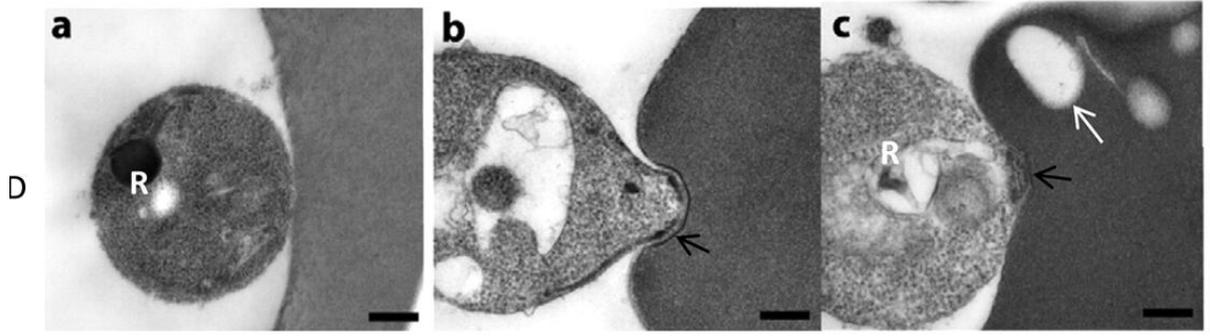
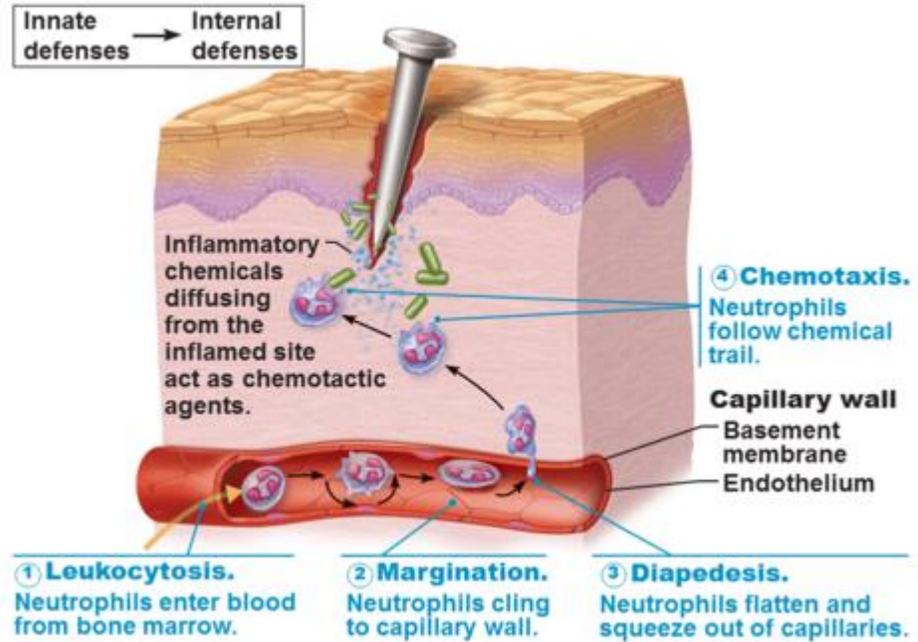
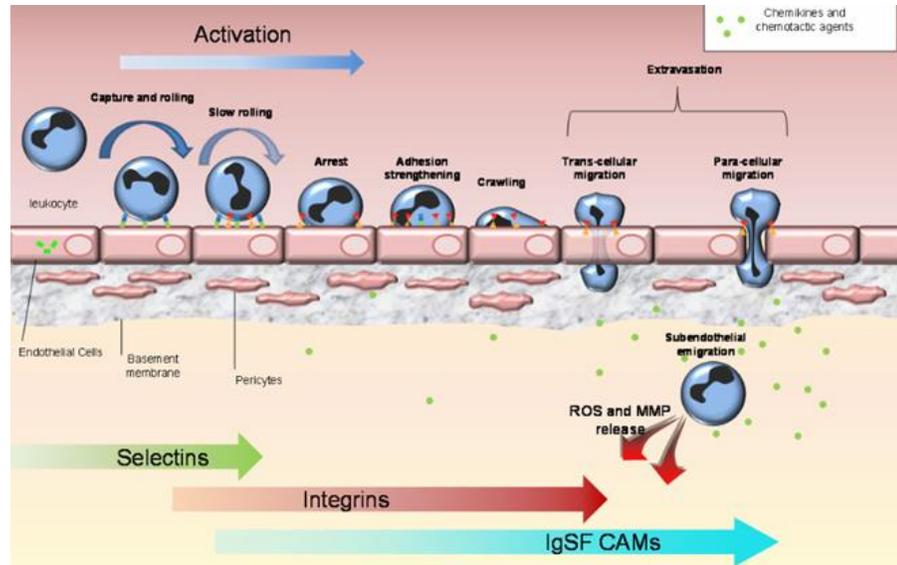
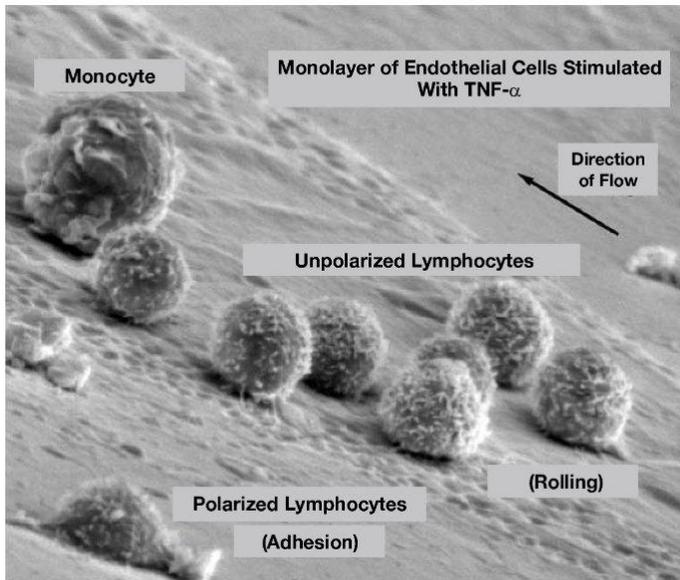
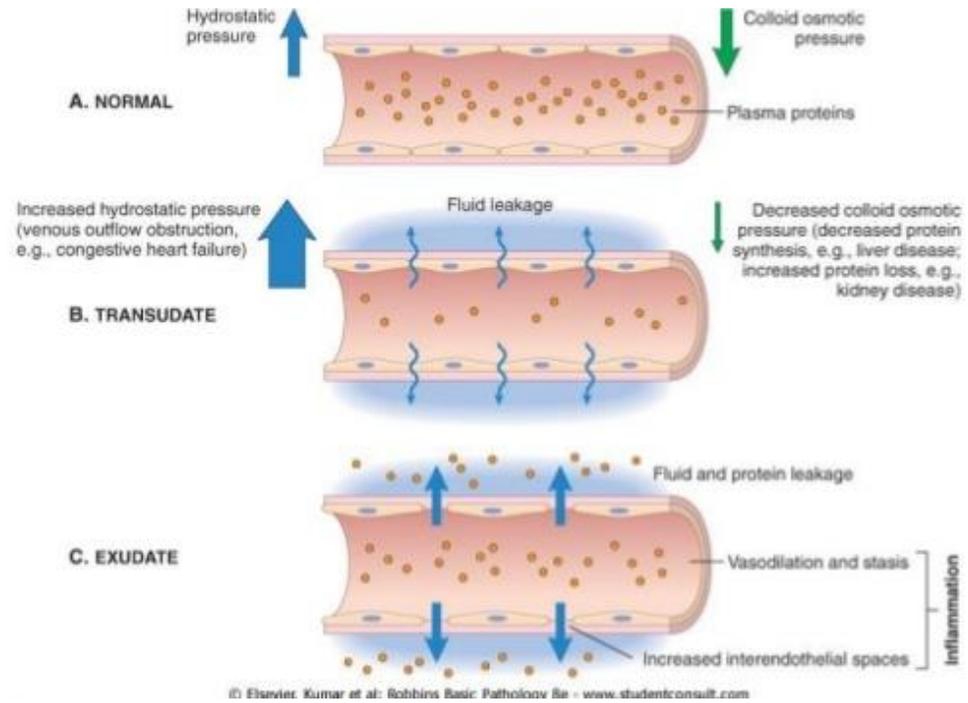


Figure 21.4 Phagocyte mobilization.



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Pathogenesis:

- *Cytoadherence (interaction with endothelial cells);*
- *Rosetting (interaction with uninfected erythrocytes);*
- *Clumping (interaction with other infected erythrocytes via platelet bridges);*
- *Release of PfGPI, hemozoin.*

Consequences:

- *mechanical obstruction of vessels ;*
- *endothelial cells apoptosis;*
- *blood-brain barrier breakdown;*
- *acidosis;*
- *oxidative stress;*
- *micro-hemorrhages;*
- *inflammation;*
- *disruption of axonal transport.*

Life threatening severe malaria disease:

- *severe anemia;*
- *cerebral malaria (brain edema);*
- *failure of respiratory system (lung edema);*
- *failure renal system;*
- *failure hepatic system.*

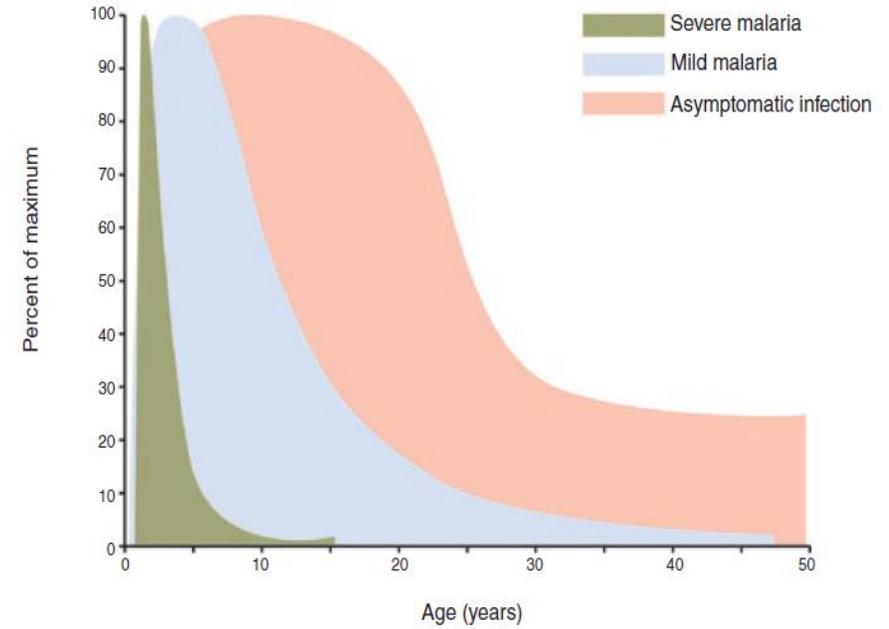
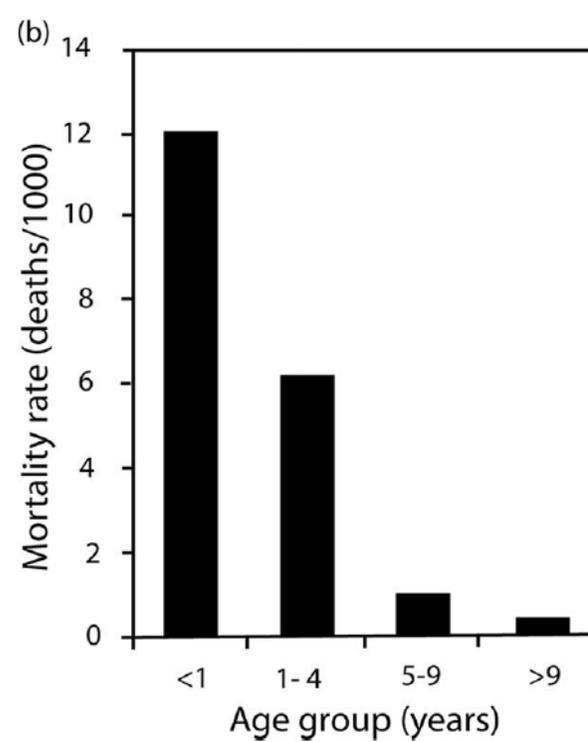
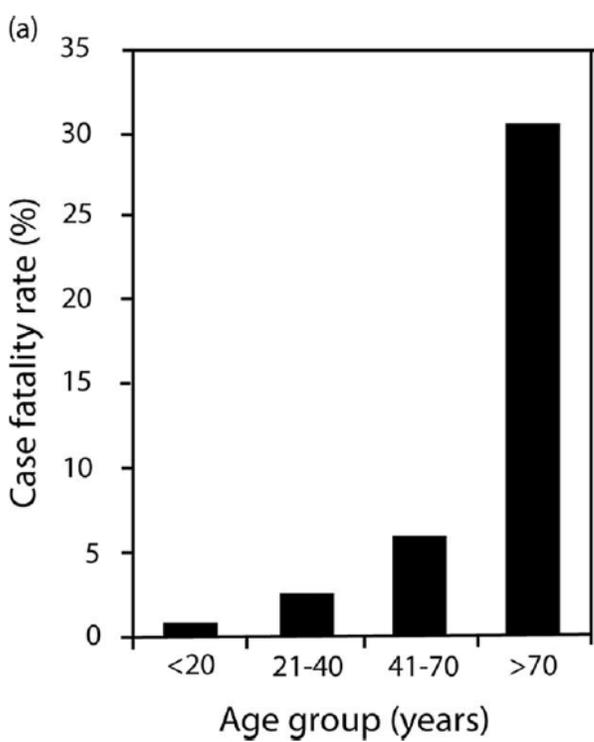
Natural immunity:

- (i) effective in adults after uninterrupted heavy exposure;
- (ii) lost upon cessation of exposure;
- (iii) species specific.

Three types of acquired immunity against plasmodia:

- (i) antidiisease immunity, conferring protection **against clinical disease**, which affects the risk and extent of morbidity associated with a given parasite density;
- (ii) antiparasite immunity, conferring protection **against parasitemia**, which affects the density of parasites;
- (iii) premunition, providing protection against new infections by maintaining a low-grade and **generally asymptomatic** parasitemia.

Sterilizing immunity against infection is never fully achieved, and an asymptomatic carrier status is the rule among adults.



Children remain remarkably resistant to high parasitemia, fever and severe disease until about 5 months of age.

The risk of cerebral malaria increases with age in children at around 4 to 5 months of age (infants become susceptible to severe disease and death) to 4-5 years old.

At about 5 years of age, the frequency of clinical disease begins to diminish and the risk of mortality sharply decreases. After the age of peak parasite prevalence, the number of clinical attacks of malaria per year dramatically declines, as does the risk of mortality.

From adolescence onwards, severe disease very rarely occurs. Rare symptomatic adults may represent the small fraction of the adult population who defy the odds of reinfection long enough for their immunity to wane.

Vaccine candidates. Blood stages?

No vaccine based on blood stage antigens in over 13 400 individuals immunized has ever provided significant protection to infection via natural mosquito bite challenge.

Sporozoite stages?

Spitalny, G.L. and Nussenzweig, R.S. (1972) Effect of various routes of immunization and methods of parasite attenuation on the development of protection against sporozoite-induced rodent malaria.

Immunization with high doses ($0.75-10^5$ sporozoites)

Intradermal injection
24% protection

Intravenous injection
95-100% protection

Epicutaneous Immunization with Autoantigenic Peptides Induces T Suppressor Cells that Prevent Experimental Allergic Encephalomyelitis

Margaret S. Bynoe,* J. Tori Evans,
Christophe Viret, and Charles A. Janeway, Jr.¹
Section of Immunobiology
Yale University School of Medicine and
Howard Hughes Medical Institute
New Haven, Connecticut 06520

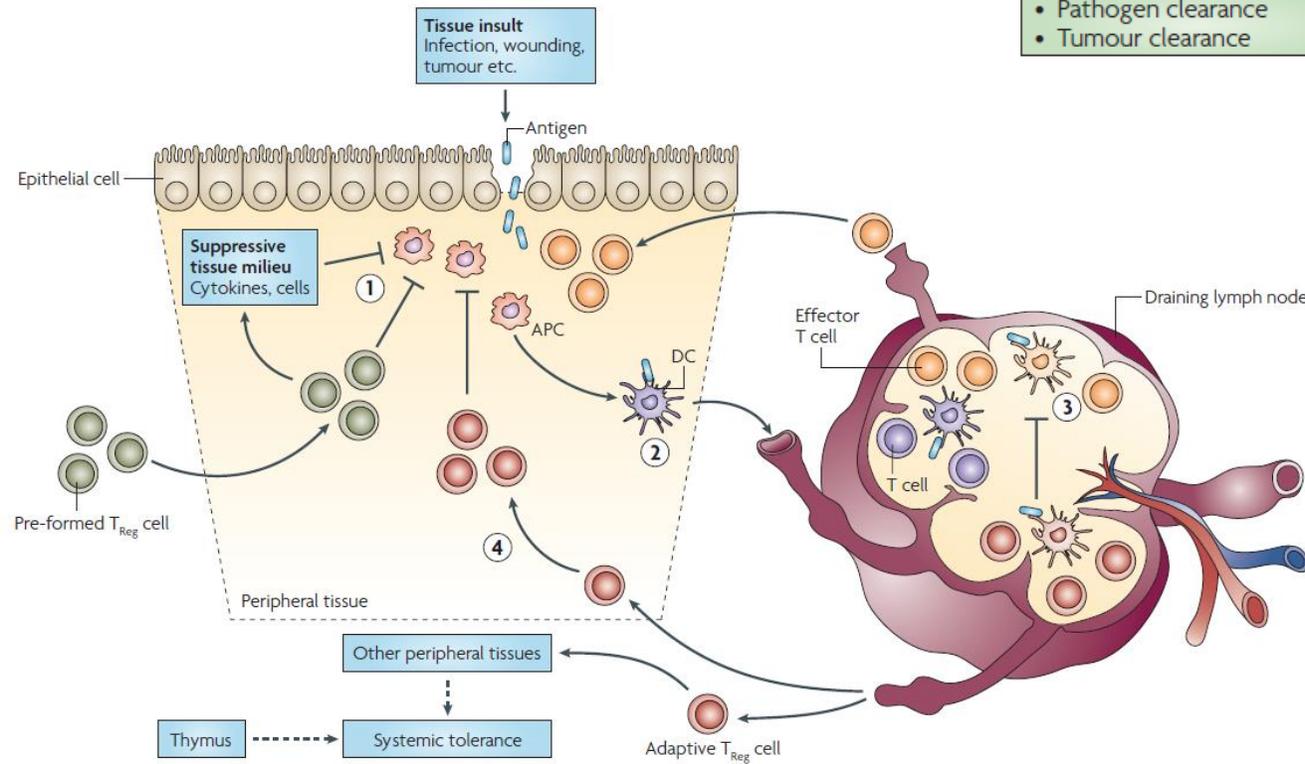
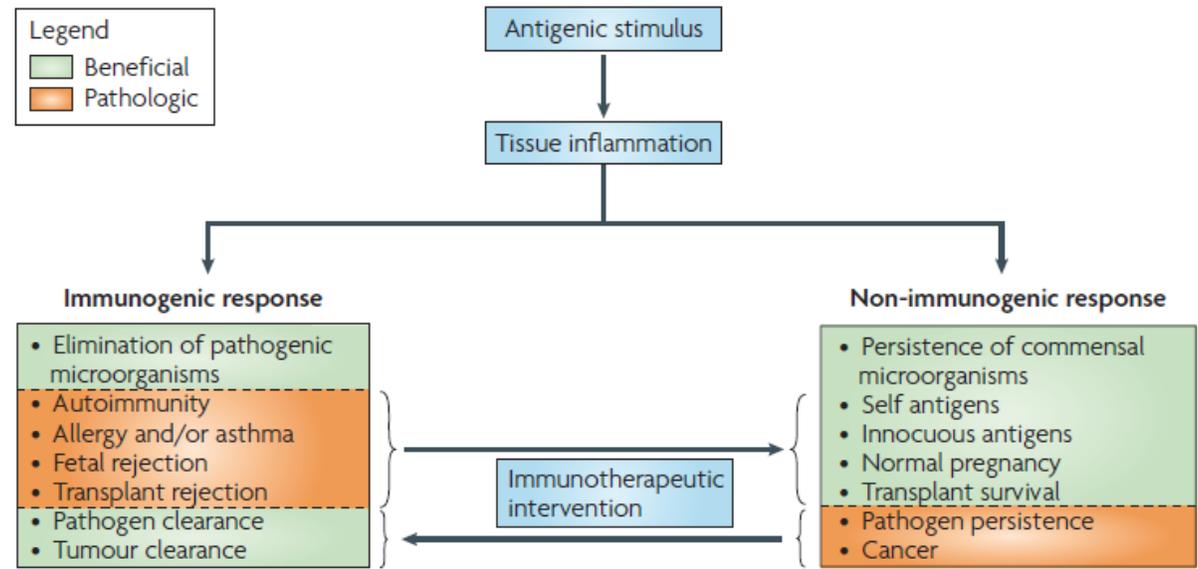
Intralymphatic allergen administration renders specific immunotherapy faster and safer: A randomized controlled trial

Gabriela Senti^{a,b}, Bettina M. Prinz Vavricka^a, Iris Erdmann^a, Mella I. Diaz^c, Richard Markus^c, Stephen J. McCormack^c, John J. Simard^{a,c}, Brunello Wüthrich^a, Reto Cramer^d, Nicole Graf^a, Pål Johansen^a, and Thomas M. Kündig^{a,1}
17908–17912 | PNAS | November 18, 2008 | vol. 105 | no. 46

Creating immune privilege: active local suppression that benefits friends, but protects foes

Andrew L. Mellor and David H. Munn

74 | JANUARY 2008 | VOLUME 8
NATURE REVIEWS | IMMUNOLOGY



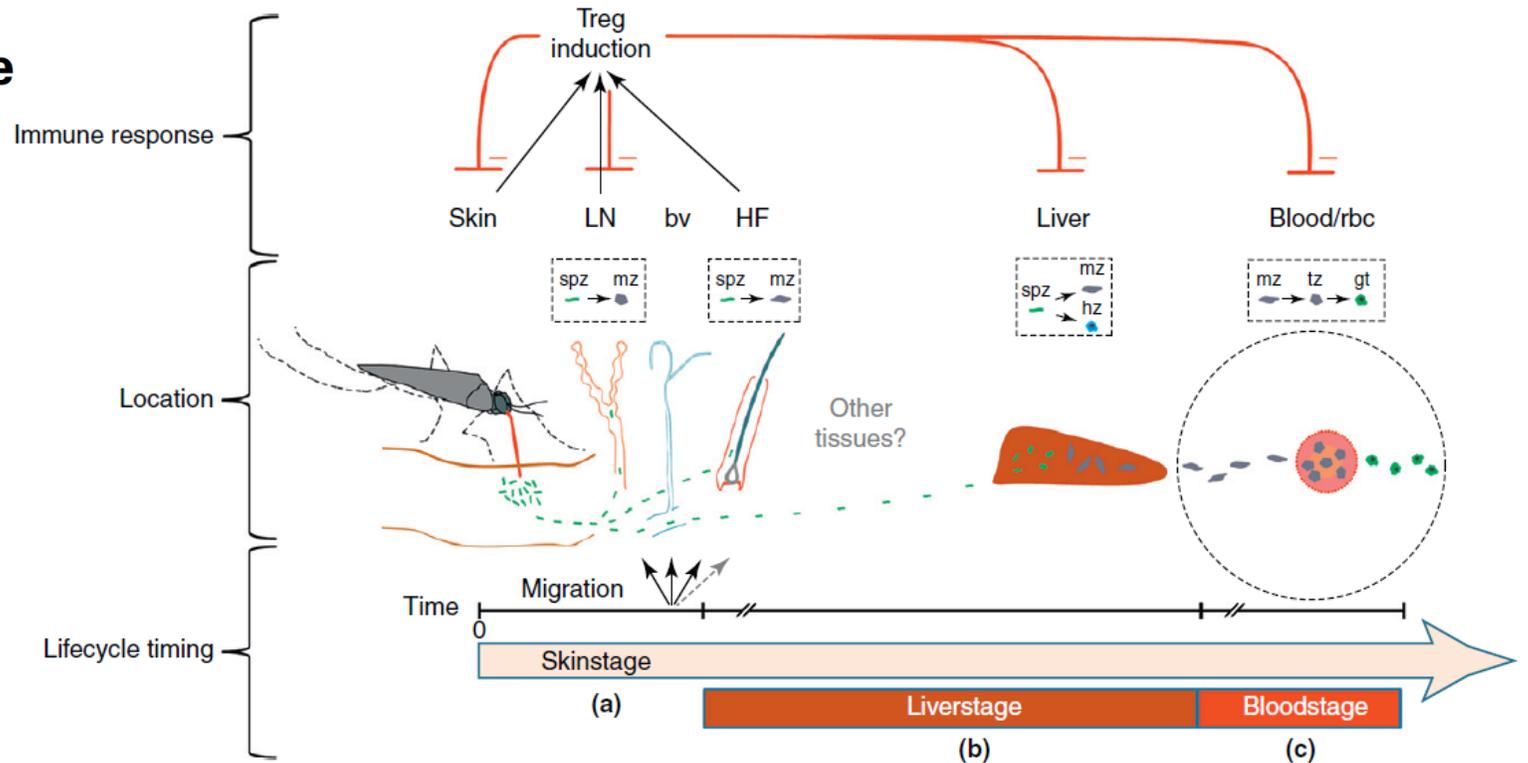
Mast Cell-Dependent Down-Regulation of Antigen-Specific Immune Responses by Mosquito Bites¹

Nadya Depinay,² Fériel Hacini,² Walid Beghdadi, Roger Peronet, and Salaheddine Mécheri³
The Journal of Immunology, 2006, 176: 4141–4146.

mosquito bites consistently induced IL-10 in draining lymph nodes, and down-regulate Ag-specific T cell responses by a mechanism dependent on mast cells and mediated by IL-10. Our results provide evidence for new mechanisms which may operate during *Plasmodium* parasite transmission by mosquito bites.

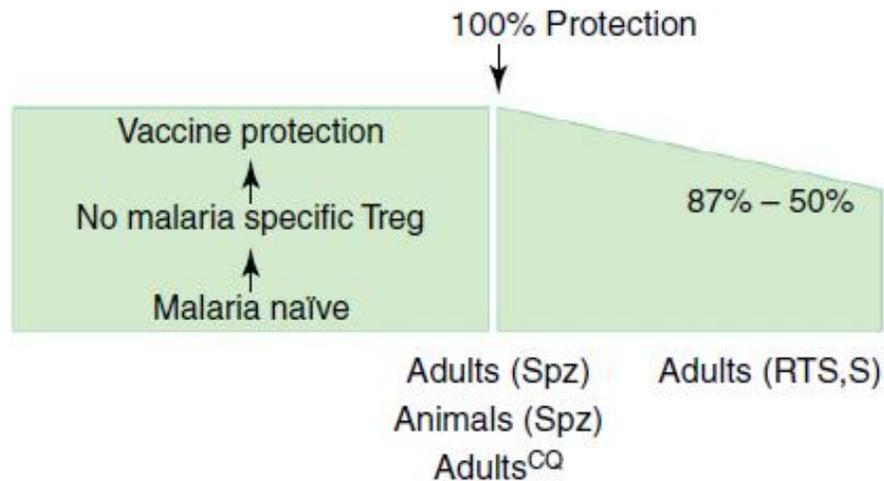
Malaria's deadly secret: a skin stage

D. Lys Guilbride¹, Patrick D.L. Guilbride² and Pawel Gawlinski³
Trends in Parasitology, April 2012, Vol. 28, No. 4

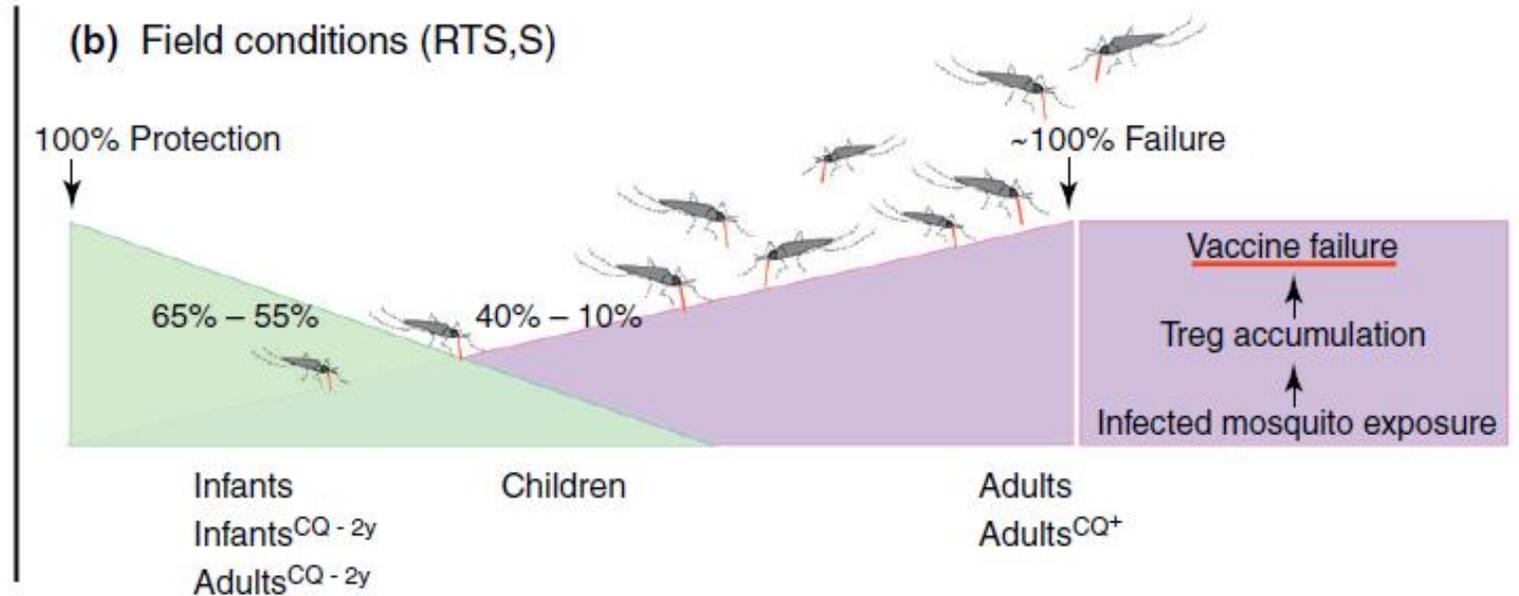


- Prophylactic mefloquine (MQ) concentrations specifically inhibit skin and immune cell/Treg gap junctions.
- MQ prophylaxis, however, only protects persons with no previous infected bite exposure.
- Immunization trials with intradermal AG injection **under strong local skin inflammation** or MQ or CQ administration result in **100% protection** against infective mosquito bite challenge.
- **Immunization into untreated skin results in 100% infection.**

(a) Laboratory conditions (All)



(b) Field conditions (RTS,S)



CD4⁺ Natural Regulatory T Cells Prevent Experimental Cerebral Malaria via CTLA-4 When Expanded In Vivo

Ashrafal Haque^{1*}, Shannon E. Best¹, Fiona H. Amante¹, Seri Mustafah¹, Laure Desbarrieres¹, Fabian de Labastida¹, Tim Sparwasser², Geoffrey R. Hill³, Christian R. Engwerda¹



PLoS Pathogens | www.plospathogens.org

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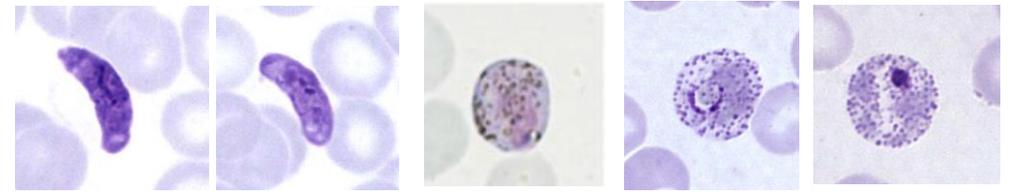
December 2010 | Volume 6 | Issue 12 | e1001221

Studies in malaria patients indicate that higher frequencies of peripheral blood CD4⁺ Foxp3⁺ CD25⁺ regulatory T (Treg) cells **correlate with increased blood parasitemia**. This observation implies that Treg cells impair pathogen clearance and thus may be detrimental to the host during infection. In contrast, elevating frequencies of natural Treg cells *in vivo* using IL-2/anti-IL-2 complexes resulted in **complete protection against severe disease**.

Plasmodium falciparum gametocytes: still many secrets of a hidden life

Pietro Alano

Molecular Microbiology (2007) 66(2), 291–302



- Minimal numbers of gametocytes emerge directly from the hepatic stages.
- The rate of gametocyte production can greatly change in subsequent waves of asexual multiplication.
- Parasite commitment to sexual differentiation is highly flexible and environment sensitive.
- Male and female gametocytes molecularly differentiate much earlier in maturation than when sex dimorphism becomes apparent.

